



NRA

Anglian Region

Hiz, Oughton and Purwell Environmental Appraisal

*Volume 3 of 3
Appendices*

Scott Wilson Kirkpatrick
CONSULTING ENGINEERS

in association with

Engineering - Science Environmental Engineers

NAIAD - Aquatic Environmental Services

Arcady Design

December 1993

504.453 NAT

SKB/93BBB

NATIONAL RIVERS AUTHORITY - ANGLIAN REGION

HIZ, OUGHTON AND PURWELL ENVIRONMENTAL APPRAISAL

FINAL REPORT (DECEMBER 1993)

VOLUME 3

APPENDICES

GENERAL REFERENCE MATERIAL

B.5 River Hiz

C.5 River Oughton & Oughtonhead Common

D.5 River Purwell

APPENDIX B5

RIVER HIZ

General Reference Material

MEMOIRS OF THE GEOLOGICAL SURVEY.

ENGLAND AND WALES.

THE WATER SUPPLY
OF
BUCKINGHAMSHIRE

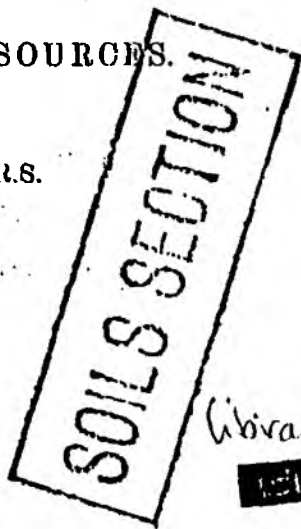
AND OF

HERTFORDSHIRE

FROM UNDERGROUND SOURCES.

BY

W. WHITAKER, B.A., F.R.S.



Library
1921

LONDON:
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1921

Melbourn Rock."

"The Melbourn Rock, which is a very large, hard, probably responsible for 'Dundale' and the springs at 'Frogmore' in the town of Tring, and the Rag-bed for those at Miswell and Bulbourne Head, the latter sending two streams in opposite directions, one running south-east . . . the other north-west."

"By the construction of the Grand Junction Canal and its reservoirs at the end of the last (18th) century, and the erection of the Tring Silk Mill in 1824, all these streams were diverted, and a considerable length of those issuing from Bulbourne Head absorbed. The other three were conducted to the Silk Mill and thence . . . to the reservoirs."

"In 1889 Dundale was converted by Lord Rothschild into its present picturesque state by raising the level and increasing the extent of the water," etc.

At Hexton St. Faith's Well is marked by a wooden cross, and Bux Well (shown on map 220) near the head of the valley southward of the village, presumably is a spring from the Totternhoe Stone.

R. E. MIDDLETON has recorded two springs at Pirton, one at Walnut Tree Farm, at a level of about 189 ft. above Ordnance Datum, presumably from Lower Chalk, and the other at Jeremiah's Tree, at a level of about 315 ft., presumably from Lower or Middle Chalk.¹

In the neighbourhood of Hitchin there are some fine sets of springs at or near the outcrop of the Melbourn Rock, that is near the junction of the Middle and Lower Chalk, the water of which all flows to the little river Hiz.

One of them is at Oughtonhead, west-north-west of the town, where the resultant streamlets have given rise to a fair-sized patch of Alluvium.

Another set is at Well Head, south-south-west of the town, where, from the marked hollow westward of the farm, there is often a big flow of water, though I was told that it was dry in 1902. The stream is reinforced by other springs just below the farm, and probably by others, down to Charlton.

The third place, named Nine Springs, east of the town, just in the parish of Great Wymondley, is on another branch of the Hiz, some of the higher water of which probably comes from the gravel and sand of the Drift.

At Norton there are several strong springs, at Nortonbury Farm (north-eastward of the village), at a level not far below the 200 ft. contour, according to a letter from Col. L. S. BOWRING, and there are others higher up the same valley, at Baldock, one (marked on the six-inch Map, Herts., sheet 7) at the parish-boundary, about a third of a mile westward of the railway-station. These are from the higher part of the Lower Chalk.

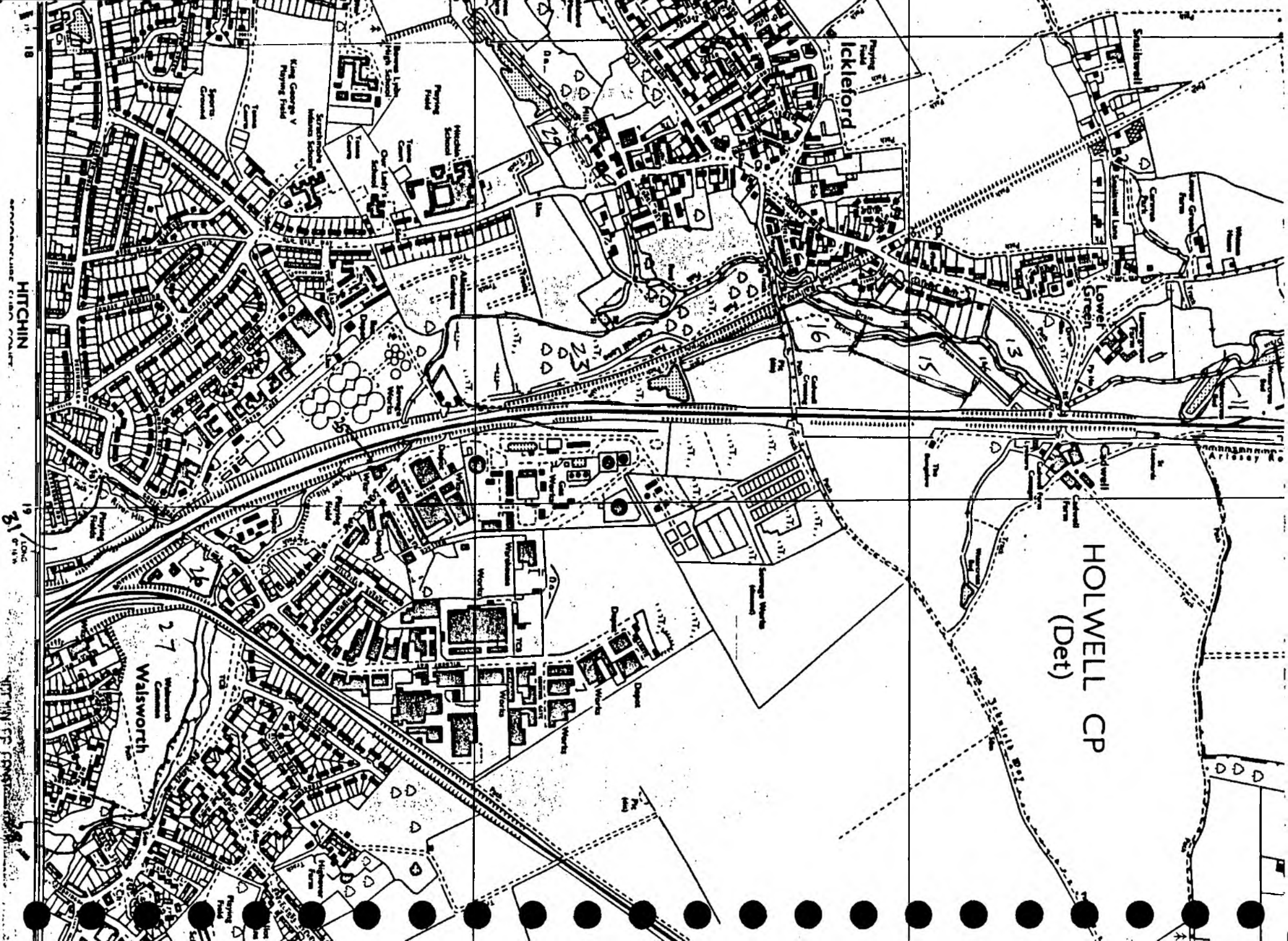
A. J. JUKES-BROWNE noted that at and near Ashwell the strongest springs are from the Totternhoe Stone.

¹ R. Comm. Metrop. Water Supply. Appendices, 1803, p. 613.

Y
E

11/023

| TL 13/V3e(4) | | LOCALITY | | HABITAT | | SOUTH EAST | | | | | | | | |
|--------------|------|---|-------|--|----------|------------|----------|-----|------|-------|-----|-------|-------|-----|
| Grid Ref. | | Cadwell: calcareous marsh. (+ Gerry's Hole: 'q') | | Thin scrub, boggy ground, mowing pasture: (old borrow pits, pools). | | Date | V.C. No. | | | | | | | |
| | | | | | | 1976- | 20 | | | | | | | |
| | | | | | | V.C. | Herts. | | | | | | | |
| | | | | | | Alt. | Code No. | | | | | | | |
| 8 | Acas | 207 | Astra | 361 | Carex | 538 | Colch | ent | 771 | Eupho | eri | 861 | Helle | pas |
| 9 | Acas | 208 | gly | 363 | dia | 540 | Conis | mac | 772 | eri | hel | 862 | Helle | pas |
| 10 | Acas | 211 | Athy | 366 | distans | 541 | Conop | mar | 777 | pepis | 863 | Helle | pas | |
| 11 | Acas | 212 | Atrip | 367 | disticha | 544 | Convo | arv | 2243 | Euphr | agg | 870 | Helle | pas |
| 12 | Acas | 214 | bas | 368 | divulsa | 548 | Convo | mar | 783 | agg | 871 | Helle | pas | |
| 13 | Acas | 217 | lit | 369 | divulsa | 550 | Coron | var | 786 | agg | 872 | Helle | pas | |
| 14 | Acas | 218 | pat | 370 | ech | 551 | Coron | var | 801 | agg | 873 | Helle | pas | |
| 15 | Acas | 219 | sab | 371 | cia | 552 | Coron | var | 804 | agg | 874 | Helle | pas | |
| 16 | Acas | 220 | Avena | 372 | eri | 553 | Coryd | cia | | | | | | |
| 17 | Acas | 221 | lud | 374 | ext | 556 | Coryd | cia | | | | | | |
| 18 | Acas | 222 | Balde | 381 | dia | 557 | Coryl | ave | 810 | Fagus | syl | 880 | Helle | pas |
| 19 | Acas | 223 | Ballo | 382 | bos | 558 | Coryl | ave | 813 | Fagus | aru | 881 | Helle | pas |
| 20 | Acas | 224 | Barba | 383 | las | 570 | Coryl | oxy | 816 | Fagus | gig | 882 | Helle | pas |
| 21 | Acas | 225 | Beili | 384 | las | 571 | Crep | bia | 821 | Fagus | pra | 883 | Helle | pas |
| 22 | Acas | 226 | Beili | 385 | lep | 572 | Crep | bia | 822 | Fagus | pra | 884 | Helle | pas |
| 23 | Acas | 227 | Beili | 386 | nig | 573 | Cuac | epi | 823 | Filag | gar | 885 | Helle | pas |
| 24 | Acas | 228 | Beili | 387 | pal | 589 | Cuac | epi | 824 | Filag | gar | 886 | Helle | pas |
| 25 | Acas | 229 | Beili | 388 | ova | 592 | Cymba | mur | 831 | Filag | gar | 887 | Helle | pas |
| 26 | Acas | 230 | Beili | 389 | pal | 596 | Cynos | off | 834 | Filag | gar | 888 | Helle | pas |
| 27 | Acas | 231 | Biden | 399 | pal | 597 | Cynos | off | 835 | Filag | gar | 889 | Helle | pas |
| 28 | Acas | 240 | Betal | 397 | ova | | | | 836 | Filag | gar | 890 | Helle | pas |
| 29 | Acas | 239 | ver | 396 | pal | | | | 837 | Filag | gar | 891 | Helle | pas |
| 30 | Acas | 241 | Biden | 399 | pal | | | | 838 | Filag | gar | 892 | Helle | pas |
| 31 | Acas | 242 | Biden | 400 | pal | | | | 839 | Filag | gar | 893 | Helle | pas |
| 32 | Acas | 243 | Biden | 401 | pal | | | | 840 | Filag | gar | 894 | Helle | pas |
| 33 | Acas | 244 | Biden | 402 | pal | | | | 841 | Filag | gar | 895 | Helle | pas |
| 34 | Acas | 245 | Biden | 403 | pal | | | | 842 | Filag | gar | 896 | Helle | pas |
| 35 | Acas | 246 | Biden | 404 | pal | | | | 843 | Filag | gar | 897 | Helle | pas |
| 36 | Acas | 247 | Biden | 405 | pal | | | | 844 | Filag | gar | 898 | Helle | pas |
| 37 | Acas | 248 | Biden | 406 | pal | | | | 845 | Filag | gar | 899 | Helle | pas |
| 38 | Acas | 249 | Biden | 407 | pal | | | | 846 | Filag | gar | 900 | Helle | pas |
| 39 | Acas | 250 | Biden | 408 | pal | | | | 847 | Filag | gar | 901 | Helle | pas |
| 40 | Acas | 251 | Biden | 409 | pal | | | | 848 | Filag | gar | 902 | Helle | pas |
| 41 | Acas | 252 | Biden | 410 | pal | | | | 849 | Filag | gar | 903 | Helle | pas |
| 42 | Acas | 253 | Biden | 411 | pal | | | | 850 | Filag | gar | 904 | Helle | pas |
| 43 | Acas | 254 | Biden | 412 | pal | | | | 851 | Filag | gar | 905 | Helle | pas |
| 44 | Acas | 255 | Biden | 413 | pal | | | | 852 | Filag | gar | 906 | Helle | pas |
| 45 | Acas | 256 | Biden | 414 | pal | | | | 853 | Filag | gar | 907 | Helle | pas |
| 46 | Acas | 257 | Biden | 415 | pal | | | | 854 | Filag | gar | 908 | Helle | pas |
| 47 | Acas | 258 | Biden | 416 | pal | | | | 855 | Filag | gar | 909 | Helle | pas |
| 48 | Acas | 259 | Biden | 417 | pal | | | | 856 | Filag | gar | 910 | Helle | pas |
| 49 | Acas | 260 | Biden | 418 | pal | | | | 857 | Filag | gar | 911 | Helle | pas |
| 50 | Acas | 261 | Biden | 419 | pal | | | | 858 | Filag | gar | 912 | Helle | pas |
| 51 | Acas | 262 | Biden | 420 | pal | | | | 859 | Filag | gar | 913 | Helle | pas |
| 52 | Acas | 263 | Biden | 421 | pal | | | | 860 | Filag | gar | 914 | Helle | pas |
| 53 | Acas | 264 | Biden | 422 | pal | | | | 861 | Filag | gar | 915 | Helle | pas |
| 54 | Acas | 265 | Biden | 423 | pal | | | | 862 | Filag | gar | 916 | Helle | pas |
| 55 | Acas | 266 | Biden | 424 | pal | | | | 863 | Filag | gar | 917 | Helle | pas |
| 56 | Acas | 267 | Biden | 425 | pal | | | | 864 | Filag | gar | 918 | Helle | pas |
| 57 | Acas | 268 | Biden | 426 | pal | | | | 865 | Filag | gar | 919 | Helle | pas |
| 58 | Acas | 269 | Biden | 427 | pal | | | | 866 | Filag | gar | 920 | Helle | pas |
| 59 | Acas | 270 | Biden | 428 | pal | | | | 867 | Filag | gar | 921 | Helle | pas |
| 60 | Acas | 271 | Biden | 429 | pal | | | | 868 | Filag | gar | 922 | Helle | pas |
| 61 | Acas | 272 | Biden | 430 | pal | | | | 869 | Filag | gar | 923 | Helle | pas |
| 62 | Acas | 273 | Biden | 431 | pal | | | | 870 | Filag | gar | 924 | Helle | pas |
| 63 | Acas | 274 | Biden | 432 | pal | | | | 871 | Filag | gar | 925 | Helle | pas |
| 64 | Acas | 275 | Biden | 433 | pal | | | | 872 | Filag | gar | 926 | Helle | pas |
| 65 | Acas | 276 | Biden | 434 | pal | | | | 873 | Filag | gar | 927 | Helle | pas |
| 66 | Acas | 277 | Biden | 435 | pal | | | | 874 | Filag | gar | 928 | Helle | pas |
| 67 | Acas | 278 | Biden | 436 | pal | | | | 875 | Filag | gar | 929 | Helle | pas |
| 68 | Acas | 279 | Biden | 437 | pal | | | | 876 | Filag | gar | 930 | Helle | pas |
| 69 | Acas | 280 | Biden | 438 | pal | | | | 877 | Filag | gar | 931 | Helle | pas |
| 70 | Acas | 281 | Biden | 439 | pal | | | | 878 | Filag | gar | 932 | Helle | pas |
| 71 | Acas | 282 | Biden | 440 | pal | | | | 879 | Filag | gar | 933 | Helle | pas |
| 72 | Acas | 283 | Biden | 441 | pal | | | | 880 | Filag | gar | 934 | Helle | pas |
| 73 | Acas | 284 | Biden | 442 | pal | | | | 881 | Filag | gar | 935 | Helle | pas |
| 74 | Acas | 285 | Biden | 443 | pal | | | | 882 | Filag | gar | 936 | Helle | pas |
| 75 | Acas | 286 | Biden | 444 | pal | | | | 883 | Filag | gar | 937 | Helle | pas |
| 76 | Acas | 287 | Biden | 445 | pal | | | | 884 | Filag | gar | 938 | Helle | pas |
| 77 | Acas | 288 | Biden | 446 | pal | | | | 885 | Filag | gar | 939 | Helle | pas |
| 78 | Acas | 289 | Biden | 447 | pal | | | | 886 | Filag | gar | 940 | Helle | pas |
| 79 | Acas | 290 | Biden | 448 | pal | | | | 887 | Filag | gar | 941 | Helle | pas |
| 80 | Acas | 291 | Biden | 449 | pal | | | | 888 | Filag | gar | 942 | Helle | pas |
| 81 | Acas | 292 | Biden | 450 | pal | | | | 889 | Filag | gar | 943 | Helle | pas |
| 82 | Acas | 293 | Biden | 451 | pal | | | | 890 | Filag | gar | 944 | Helle | pas |
| 83 | Acas | 294 | Biden | 452 | pal | | | | 891 | Filag | gar | 945 | Helle | pas |
| 84 | Acas | 295 | Biden | 453 | pal | | | | 892 | Filag | gar | 946 | Helle | pas |
| 85 | Acas | 296 | Biden | 454 | pal | | | | 893 | Filag | gar | 947 | Helle | pas |
| 86 | Acas | 297 | Biden | 455 | pal | | | | 894 | Filag | gar | 948 | Helle | pas |
| 87 | Acas | 298 | Biden | 456 | pal | | | | 895 | Filag | gar | 949 | Helle | pas |
| 88 | Acas | 299 | Biden | 457 | pal | | | | 896 | Filag | gar | 950 | Helle | pas |
| 89 | Acas | 300 | Biden | 458 | pal | | | | 897 | Filag | gar | 951 | Helle | pas |
| 90 | Acas | 301 | Biden | 459 | pal | | | | 898 | Filag | gar | 952 | Helle | pas |
| 91 | Acas | 302 | Biden | 460 | pal | | | | 899 | Filag | gar | 953 | Helle | pas |
| 92 | Acas | 303 | Biden | 461 | pal | | | | 900 | Filag | gar | 954 | Helle | pas |
| 93 | Acas | 304 | Biden | 462 | pal | | | | 901 | Filag | gar | 955 | Helle | pas |
| 94 | Acas | 305 | Biden | 463 | pal | | | | 902 | Filag | gar | 956 | Helle | pas |
| 95 | Acas | 306 | Biden | 464 | pal | | | | 903 | Filag | gar | 957 | Helle | pas |
| 96 | Acas | 307 | Biden | 465 | pal | | | | 904 | Filag | gar | 958 | Helle | pas |
| 97 | Acas | 308 | Biden | 466 | pal | | | | 905 | Filag | gar | 959 | Helle | pas |
| 98 | Acas | 309 | Biden | 467 | pal | | | | 906 | Filag | gar | 960 | Helle | pas |
| 99 | Acas | 310 | Biden | 468 | pal | | | | 907 | Filag | gar | 961 | Helle | pas |
| 100 | Acas | 311 | Biden | 469 | pal | | | | 908 | Filag | gar | 962 | Helle | pas |
| 101 | Acas | 312 | Biden | 470 | pal | | | | 909 | Filag | gar | 963 | Helle | pas |
| 102 | Acas | 313 | Biden | 471 | pal | | | | 910 | Filag | gar | 964 | Helle | pas |
| 103 | Acas | 314 | Biden | 472 | pal | | | | 911 | Filag | gar | 965 | Helle | pas |
| 104 | Acas | 315 | Biden | 473 | pal | | | | 912 | Filag | gar | 966 | Helle | pas |
| 105 | Acas | 316 | Biden | 474 | pal | | | | 913 | Filag | gar | 967 | Helle | pas |
| 106 | Acas | 317 | Biden | 475 | pal | | | | 914 | Filag | gar | 968 | Helle | pas |
| 107 | Acas | 318 | Biden | 476 | pal | | | | 915 | Filag | gar | 969 | Helle | pas |
| 108 | Acas | 319 | Biden | 477 | pal | | | | 916 | Filag | gar | 970 | Helle | pas |
| 109 | Acas | 320 | Biden | 478 | pal | | | | 917 | Filag | gar | 971 | Helle | pas |
| 110 | Acas | 321 | Biden | 479 | pal | | | | 918 | Filag | gar | 972 | Helle | pas |
| 111 | Acas | 322 | Biden | 480 | pal | | | | 919 | Filag | gar | 973 | Helle | pas |
| 112 | Acas | 323 | Biden | 481 | pal | | | | 920 | Filag | gar | 974 | Helle | pas |
| 113 | Acas | 324 | Biden | 482 | pal | | | | 921 | Filag | gar | 975 | Helle | pas |
| 114 | Acas | 325 | Biden | 483 | pal | | | | 922 | Filag | gar | 976 | Helle | pas |
| 115 | Acas | 326 | Biden | 484 | pal | | | | 923 | Filag | gar | 977 | Helle | pas |
| 116 | Acas | 327 | Biden | 485 | pal | | | | 924 | Filag | gar | 978 | Helle | pas |
| 117 | Acas | 328 | | | | | | | | | | | | |



HOLWELL CP
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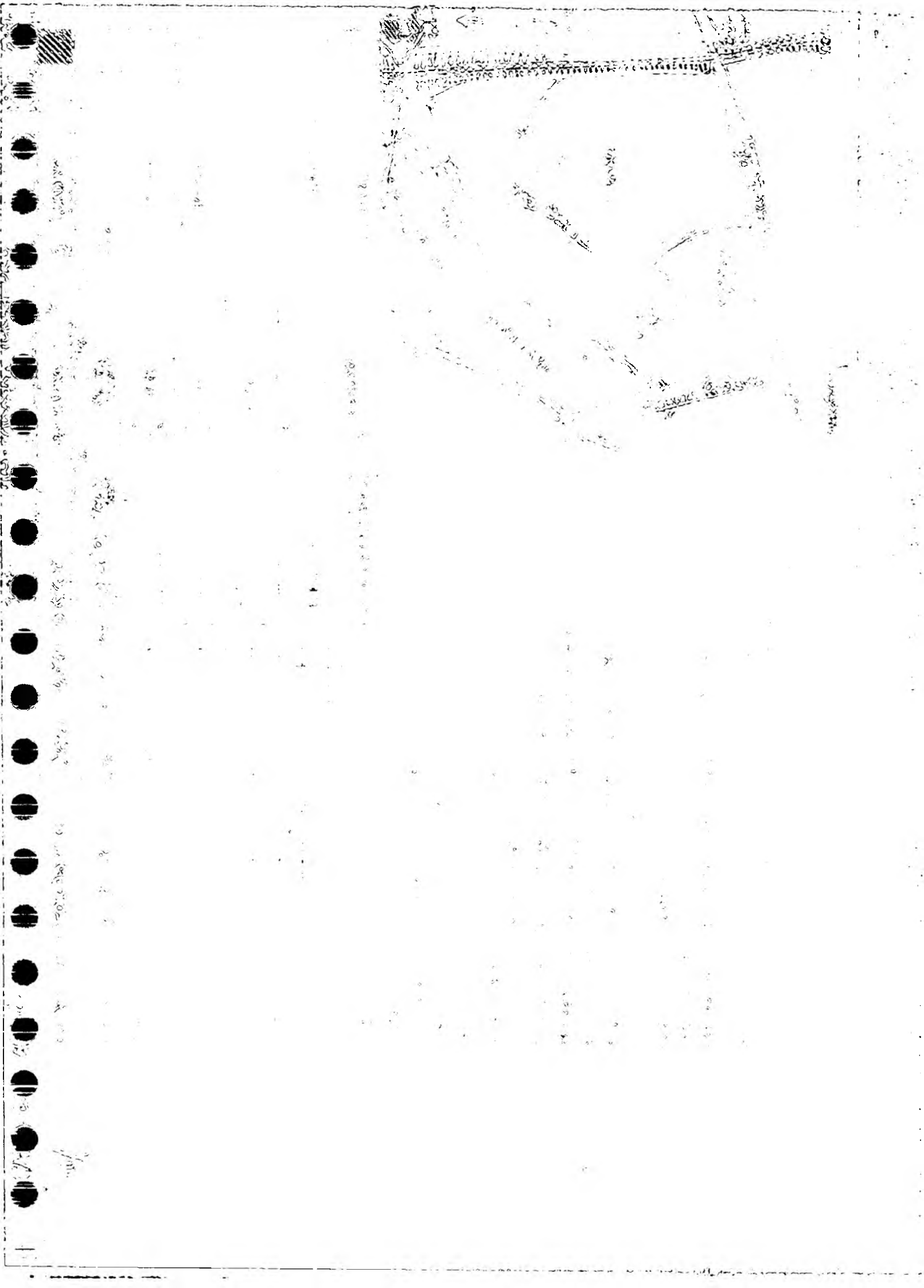
Walsworth

HITCHIN

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| 1245 | 1246 | 1247 | 1248 | 1249 | 1250 | 1251 | 1252 | 1253 | 1254 | 1255 | 1256 | 1257 | 1258 | 1259 | 1260 | 1261 | 1262 | 1263 | 1264 | 1265 | 1266 | 1267 | 1268 | 1269 | 1270 | 1271 | 1272 | 1273 | 1274 | 1275 | 1276 | 1277 | 1278 | 1279 | 1280 | 1281 | 1282 | 1283 | 1284 | 1285 | 1286 | 1287 | 1288 | 1289 | 1290 | 1291 | 1292 | 1293 | 1294 | 1295 | 1296 | 1297 | 1298 | 1299 | 1300 | 1301 | 1302 | 1303 | 1304 | 1305 | 1306 | 1307 | 1308 | 1309 | 1310 | 1311 | 1312 | 1313 | 1314 | 1315 | 1316 | 1317 | 1318 | 1319 | 1320 | 1321 | 1322 | 1323 | 1324 | 1325 | 1326 | 1327 | 1328 | 1329 | 1330 | 1331 | 1332 | 1333 | 1334 | 1335 | 1336 | 1337 | 1338 | 1339 | 1340 | 1341 | 1342 | 1343 | 1344 | 1345 | 1346 | 1347 | 1348 | 1349 | 1350 | 1351 | 1352 | 1353 | 1354 | 1355 | 1356 | 1357 | 1358 | 1359 | 1360 | 1361 | 1362 | 1363 | 1364 | 1365 | 1366 | 1367 | 1368 | 1369 | 1370 | 1371 | 1372 | 1373 | 1374 | 1375 | 1376 | 1377 | 1378 | 1379 | 1380 | 1381 | 1382 | 1383 | 1384 | 1385 | 1386 | 1387 | 1388 | 1389 | 1390 | 1391 | 1392 | 1393 | 1394 | 1395 | 1396 | 1397 | 1398 | 1399 | 1400 | 1401 | 1402 | 1403 | 1404 | 1405 | 1406 | 1407 | 1408 | 1409 | 1410 | 1411 | 1412 | 1413 | 1414 | 1415 | 1416 | 1417 | 1418 | 1419 | 1420 | 1421 | 1422 | 1423 | 1424 | 1425 | 1426 | 1427 | 1428 | 1429 | 1430 | 1431 | 1432 | 1433 | 1434 | 1435 | 1436 | 1437 | 1438 | 1439 | 1440 | 1441 | 1442 | 1443 | 1444 | 1445 | 1446 | 1447 | 1448 | 1449 | 1450 | 1451 | 1452 | 1453 | 1454 | 1455 | 1456 | 1457 | 1458 | 1459 | 1460 | 1461 | 1462 | 1463 | 1464 | 1465 | 1466 | 1467 | 1468 | 1469 | 1470 | 1471 | 1472 | 1473 | 1474 | 1475 | 1476 | 1477 | 1478 | 1479 | 1480 | 1481 | 1482 | 1483 | 1484 | 1485 | 1486 | 1487 | 1488 | 1489 | 1490 | 1491 | 1492 | 1493 | 1494 | 1495 | 1496 | 1497 | 1498 | 1499 | 1500 | 1501 | 1502 | 1503 | 1504 | 1505 | 1506 | 1507 | 1508 | 1509 | 1510 | 1511 | 1512 | 1513 | 1514 | 1515 | 1516 | 1517 | 1518 | 1519 | 1520 | 1521 | 1522 | 1523 | 1524 | 1525 | 1526 | 1527 | 1528 | 1529 | 1530 | 1531 | 1532 | 1533 | 1534 | 1535 | 1536 | 1537 | 1538 | 1539 | 1540 | 1541 | 1542 | 1543 | 1544 | 1545 | 1546 | 1547 | 1548 | 1549 | 1550 | 1551 | 1552 | 1553 | 1554 | 1555 | 1556 | 1557 | 1558 | 1559 | 1560 | 1561 | 1562 | 1563 | 1564 | 1565 | 1566 | 1567 | 1568 | 1569 | 1570 | 1571 | 1572 | 1573 | 1574 | 1575 | 1576 | 1577 | 1578 | 1579 | 1580 | 1581 | 1582 | 1583 | 1584 | 1585 | 1586 | 1587 | 1588 | 1589 | 1590 | 1591 | 1592 | 1593 | 1594 | 1595 | 1596 | 1597 | 1598 | 1599 | 1600 | 1601 | 1602 | 1603 | 1604 | 1605 | 1606 | 1607 | 1608 | 1609 | 1610 | 1611 | 1612 | 1613 | 1614 | 1615 | 1616 | 1617 | 1618 | 1619 | 1620 | 1621 | 1622 | 1623 | 1624 | 1625 | 1626 | 1627 | 1628 | 1629 | 1630 | 1631 | 1632 | 1633 | 1634 | 1635 | 1636 | 1637 | 1638 | 1639 | 1640 | 1641 | 1642 | 1643 | 1644 | 1645 | 1646 | 1647 | 1648 | 1649 | 1650 | 1651 | 1652 | 1653 | 1654 | 1655 | 1656 | 1657 | 1658 | 1659 | 1660 | 1661 | 1662 | 1663 | 1664 | 1665 | 1666 | 1667 | 1668 | 1669 | 1670 | 1671 | 1672 | 1673 | 1674 | 1675 | 1676 | 1677 | 1678 | 1679 | 1680 | 1681 | 1682 | 1683 | 1684 | 1685 | 1686 | 1687 | 1688 | 1689 | 1690 | 1691 | 1692 | 1693 | 1694 | 1695 | 1696 | 1697 | 1698 | 1699 | 1700 | 1701 | 1702 | 1703 | 1704 | 1705 | 1706 | 1707 | 1708 | 1709 | 1710 | 1711 | 1712 | 1713 | 1714 | 1715 | 1716 | 1717 | 1718 | 1719 | 1720 | 1721 | 1722 | 1723 | 1724 | 1725 | 1726 | 1727 | 1728 | 1729 | 1730 | 1731 | 1732 | 1733 | 1734 | 1735 | 1736 | 1737 | 1738 | 1739 | 1740 | 1741 | 1742 | 1743 | 1744 | 1745 | 1746 | 1747 | 1748 | 1749 | 1750 | 1751 | 1752 | 1753 | 1754 | 1755 | 1756 | 1757 | 1758 | 1759 | 1760 | 1761 | 1762 | 1763 | 1764 | 1765 | 1766 | 1767 | 1768 | 1769 | 1770 | 1771 | 1772 | 1773 | 1774 | 1775 | 1776 | 1777 | 1778 | 1779 | 1780 | 1781 | 1782 | 1783 | 1784 | 1785 | 1786 | 1787 | 1788 | 1789 | 1790 | 1791 | 1792 | 1793 | 1794 | 1795 | 1796 | 1797 | 1798 | 1799 | 1800 | 1801 | 1802 | 1803 | 1804 | 1805 | 1806 | 1807 | 1808 | 1809 | 1810 | 1811 | 1812 | 1813 | 1814 | 1815 | 1816 | 1817 | 1818 | 1819 | 1820 | 1821 | 1822 | 1823 | 1824 | 1825 | 1826 | 1827 | 1828 | 1829 | 1830 | 1831 | 1832 | 1833 | 1834 | 1835 | 1836 | 1837 | 1838 | 1839 | 1840 | 1841 | 1842 | 1843 | 1844 | 1845 | 1846 | 1847 | 1848 | 1849 | 1850 | 1851 | 1852 | 1853 | 1854 | 1855 | 1856 | 1857 | 1858 | 1859 | 1860 | 1861 | 1862 | 1863 | 1864 | 1865 | 1866 | 1867 | 1868 | 1869 | 1870 | 1871 | 1872 | 1873 | 1874 | 1875 | 1876 | 1877 | 1878 | 1879 | 1880 | 1881 | 1882 | 1883 | 1884 | 1885 | 1886 | 1887 | 1888 | 1889 | 1890 | 1891 | 1892 | 1893 | 1894 | 1895 | 1896 | 1897 | 1898 | 1899 | 1900 | 1901 | 1902 | 1903 | 1904 | 1905 | 1906 | 1907 | 1908 | 1909 | 1910 | 1911 | 1912 | 1913 | 1914 | 1915 | 1916 | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | 1930 | 1931 | 1932 | 1933 | 1934 | 1935 | 1936 | 1937 | 1938 | 1939 | 1940 | 1941 | 1942 | 1943 | 1944 | 1945 | 1946 | 1947 | 1948 | 1949 | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 | 2051 | 2052 | 2053 | 2054 | 2055 | 2056 | 2057 | 2058 | 2059 | 2060 | 2061 | 2062 | 2063 | 2064 | 2065 | 2066 | 2067 | 2068 | 2069 | 2070 | 2071 | 2072 | 2073 | 2074 | 2075 | 2076 | 2077 | 2078 | 2079 | 2080 | 2081 | 2082 | 2083 | 2084 | 2085 | 2086 | 2087 | 2088 | 2089 | 2090 | 2091 | 2092 | 2093 | 2094 | 2095 | 2096 | 2097 | 2098 | 2099 | 2100 | 2101 | 2102 | 2103 | 2104 | 2105 | 2106 | 2107 | 2108 | 2109 | 2110 | 2111 | 2112 | 2113 | 2114 | 2115 | 2116 | 2117 | 2118 | 2119 | 2120 | 2121 | 2122 | 2123 | 2124 | 2125 | 2126 | 2127 | 2128 | 2129 | 2130 | 2131 | 2132 | 2133 | 2134 | 2135 | 2136 | 2137 | 2138 | 2139 | 2140 | 2141 | 2142 | 2143 | 2144 | 2145 | 2146 | 2147 | 2148 | 2149 | 2150 | 2151 | 2152 | 2153 | 2154 | 2155 | 2156 | 2157 | 2158 | 2159 | 2160 | 2161 | 2162 | 2163 | 2164 | 2165 | 2166 | 2167 | 2168 | 2169 | 2170 | 2171 | 2172 | 2173 | 2174 | 2175 | 2176 | 2177 | 2178 | 2179 | 2180 | 2181 | 2182 | 2183 | 2184 | 2185 | 2186 | 2187 | 2188 | 2189 | 2190 | 2191 | 2192 | 2193 | 2194 | 2195 | 2196 | 2197 | 2198 | 2199 | 2200 | 2201 | 2202 | 2203 | 2204 | 2205 | 2206 | 2207 | 2208 | 2209 | 2210 | 2211 | 2212 | 2213 | 2214 | 2215 | 2216 | 2217 | 2218 | 2219 | 2220 | 2221 | 2222 | 2223 | 2224 | 2225 | 2226 | 2227 | 2228 | 2229 | 2230 | 2231 | 2232 | 2233 | 2234 | 2235 | 2236 | 2237 | 2238 | 2239 | 2240 | 2241 | 2242 | 2243 | 2244 | 2245 | 2246 | 2247 | 2248 | 2249 | 2250 | 2251 | 2252 | 2253 | 2254 | 2255 | 2256 | 2257 | 2258 | 2259 | 2260 | 2261 | 2262 | 2263 | 2264 | 2265 | 2266 | 2267 | 2268 | 2269 | 2270 | 2271 | 2272 | 2273 | 2274 | 2275 | 2276 | 2277 | 2278 | 2279 | 2280 | 2281 | 2282 | 2283 | 2284 | 2285 | 2286 | 2287 | 2288 | 2289 | 2290 | 2291 | 2292 | 2293 | 2294 | 2295 | 2296 | 2297 | 2298 | 2299 | 2300 | 2301 | 2302 | 2303 | 2304 | 2305 | 2306 | 2307 | 2308 | 2309 | 2310 | 2311 | 2312 | 2313 | 2314 | 2315 | 2316 | 2317 | 2318 | 2319 | 2320 | 2321 | 2322 | 2323 | 2324 | 2325 | 2326 | 2327 | 2328 | 2329 | 2330 | 2331 | 2332 | 2333 | 2334 | 2335 | 2336 | 2337 | 2338 | 2339 | 2340 | 2341 | 2342 | 2343 | 2344 | 2345 | 2346 | 2347 | 2348 | 2349 | 2350 | 2351 | 2352 | 2353 | 2354 | 2355 | 2356 | 2357 | 2358 | 2359 | 2360 | 2361 | 2362 | 2363 | 2364 | 2365 | 2366 | 2367 | 2368 | 2369 | 2370 | 2371 | 2372 | 2373 | 2374 | 2375 | 2376 | 2377 | 2378 | 2379 | 2380 | 2381 | 2382 | 2383 | 2384 | 2385 | 2386 | 2387 | 2388 | 2389 | 2390 | 2391 | 2392 | 2393 | 2394 | 2395 | 2396 | 2397 | 2398 | 2399 | 2400 | 2401 | 2402 | 2403 | 2404 | 2405 | 2406 | 2407 | 2408 | 2409 | 2410 | 2411 | 2412 | 2413 | 2414 | 2415 | 2416 | 2417 | 2418 | 2419 | 2420 | 2421 | 2422 | 2423 | 2424 | 2425 | 2426 | 2427 | 2428 | 2429 | 2430 | 2431 | 2432 | 2433 | 2434 | 2435 | 2436 | 2437 | 2438 | 2439 | 2440 | 2441 | 2442 | 2443 | 2444 | 2445 | 2446 | 2447 | 2448 | 2449 | 2450 | 2451 | 2452 | 2453 | 2454 | 2455 | 2456 | 2457 | 2458 | 2459 | 2460 | 2461 | 2462 | 2463 | 2464 | 2465 | 2466 | 2467 | 2468 | 2469 | 2470 | 2471 | 2472 | 2473 | 2474 | 2475 | 2476 | 2477 | 2478 | 2479 | 2480 | 2481 | 2482 | 2483 | 2484 | 2485 | 2486 | 2487 | 2488 | 2489 | 2490 | 2491 | 2492 | 2493 | 2494 | 2495 | 2496 | 2497 | 2498 | 2499 | 2500 | 2501 | 2502 | 2503 | 2504 | 2505 | 2506 | 2507 | 2508 | 2509 | 2510 | 2511 | 2512 | 2513 | 2514 | 2515 | 2516 | 2517 | 2518 | 2519 | 2520 | 2521 | 2522 | 2523 | 2524 | 2525 | 2526 | 2527 | 2528 | 2529 | 2530 | 2531 | 2532 | 2533 | 2534 | 2535 | 2536 | 2537 | 2538 | 2539 | 2540 | 2541 | 2542 | 2543 | 2544 | 2545 | 2546 | 2547 | 2548 | 2549 | 2550 | 2551 | 2552 | 2553 | 2554 | 2555 | 2556 | 2557 | 2558 | 2559 | 2560 | 2561 | 2562 | 2563 | 2564 | 2565 | 2566 | 2567 | 2568 | 2569 | 2570 | 2571 | 2572 | 2573 | 2574 | 2575 | 2576 | 2577 | 2578 | 2579 | 2580 | 2581 | 2582 | 2583 | 2584 | 2585 | 2586 | 2587 | 2588 | 2589 | 2590 | 2591 | 2592 | 2593 | 2594 | 2595 | 2596 | 2597 | 2598 | 2599 | 2600 | 2601 | 2602 | 2603 | 2604 | 2605 | 2606 | 2607 | 2608 | 2609 | 2610 | 2611 | |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-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| TL 13/V3a | Grid Ref. | LOCALITY | | Cadwell Marsh: | | SOUTH EAST | | | | | | | | | | | |
|-----------|-----------|---------------------------------|----------------------------------|----------------|----------|------------|-------|----------|-----|--------|-------|------|-------|--------|------|----------|------|
| | | V3 Marshy ground, Cadwell Lane. | | Date | V.C. No. | | | | | | | | | | | | |
| | | | | 10-5-76 | 20 | | | | | | | | | | | | |
| | | HABITAT | Scirpus sedge marsh / riverside. | | V.C. | Herts. | | | | | | | | | | | |
| | | | | | Alt. | Code No. | | | | | | | | | | | |
| 8 | Acer | cam | 207 | Astra | dan | 361 | Carex | dum | 538 | Colch | ant | 771 | Eupho | evi | 961 | Helic | pra |
| 9 | Acer | pse | 208 | | gly | 363 | | dia | 540 | Gnlu | mac | 772 | | hel | 962 | | pub |
| 6 | Acer | ant | 211 | Athy | gl | 368 | | distans | 541 | Conop | naj | 777 | | peplus | 963 | Ilerac | spl |
| 7 | Achil | mil | 212 | Atrip | gla | 367 | | disticha | 544 | Convo | arj | 2243 | Euphr | ang | 964 | Hiera | pil |
| 9 | | pta | 214 | | bas | 368 | | divisa | 548 | Cornu | san | 783 | | ang | 979 | Hippo | com |
| 12 | Acino | arv | 217 | | lit | 369 | | divulsa | 554 | Coron | var | 783 | | neu | 980 | Hippo | rha |
| 13 | Acoru | cal | 218 | | pat | 370 | | ech | 551 | Coron | did | 801 | | pse | 981 | Hippo | lan |
| 15 | Adora | mos | 216 | | sab | 371 | | ela | 552 | | squ | 804 | | ros | 983 | Holu | lan |
| 20 | Aegop | pod | 220 | Avena | fat | 373 | | eri | 553 | Coryd | cla | | | | 984 | | mei |
| 21 | Aescu | lup | 221 | | lud | 374 | | ext | 558 | | lut | | | | 988 | Honke | pop |
| 21 | Aethu | cys | | | | 376 | | flacca | | | | | | | 989 | Horde | mar |
| 22 | Agrim | eup | 224 | Balde | ran | 381 | | hir | | | | 813 | Festu | aru | 991 | Horde | mar |
| 23 | | odo | 225 | Dallo | nig | 382 | | bos | 570 | | oxy | 816 | | gig | 992 | | mur |
| 26 | Agrop | can | 226 | | | 385 | | lae | 571 | Crept | bis | 821 | | *ovi | 993 | | sec |
| 28 | | jun | 231 | Belli | per | 386 | | las | 572 | | cap | 823 | | pra | 995 | Hotto | pal |
| 32 | | pao | 232 | Berbe | vul | 387 | | lep | 578 | | tar | 824 | | *rub | 996 | Humud | pal |
| 33 | | rep | 234 | Berul | tre | 393 | | nig | 583 | Cuscus | epi | 830 | Filag | ger | 998 | Hydro | mor |
| 35 | Agros | can | 235 | Beta | mar | 396 | | otr | 589 | | epith | 831 | | nain | 999 | Hydro | vil |
| 36 | | gig | 240 | Betul | pub | 397 | | ova | 592 | Cymba | nur | | | | 1003 | Hyper | and |
| 39 | | sto | 239 | | ver | 398 | | pal | 598 | Cynos | off | 834 | | vul | 1004 | | cal |
| 40 | | ten | 241 | Diden | cor | 399 | | pal | 597 | Cynos | cri | 835 | Foeni | vul | 1006 | | dub |
| 41 | Alra | car | 242 | | tri | 400 | | panicca | | | | 836 | Fraga | ana | 1008 | | elo |
| 42 | | pra | 243 | Black | per | 401 | | panicula | 607 | Dactyl | glo | 839 | | ves | 1011 | hirsutum | |
| 46 | Ajuca | rep | 244 | Blech | spl | 404 | | pen | 617 | Daplin | lau | 839 | Frang | aln | 1011 | | hum |
| 57 | Alche | ves | 245 | Elytra | com | 405 | | pill | 620 | Dauca | car | 844 | | | 1014 | | per |
| 60 | xan | 248 | Eotyri | lum | 406 | | | pol | 627 | Desch | cae | 847 | Fumar | cap | 1015 | | pul |
| 62 | Alism | lan | 249 | Brach | pin | 407 | | pse | 628 | | fe | 849 | | mo | 1016 | | tet |
| 63 | | pla | 250 | | syl | 408 | | put | 630 | Descu | pos | 854 | | off | 1018 | Hypoc | glad |
| 64 | Allia | pet | 251 | Brass | nsp | 412 | | rem | 434 | Desuna | mar | 856 | | par | 1020 | | |
| 75 | Alliu | ura | 252 | | nig | 413 | | rip | 435 | | nig | 858 | | vai | | | |
| 76 | | vio | 253 | | ole | 414 | | ros | 640 | Digit | pur | | | | 1022 | Iberi | ama |
| 77 | Alnus | gliu | 254 | | rap | 419 | | ser | 644 | Diplo | nur | | | | 1023 | flex | aqu |
| 79 | Alope | seq | 256 | Eriza | med | 421 | | syl</ | | | | | | | | | |

11/023

| | | | |
|---|----------|---|---|
| T213/V3c+d. | | | |
| Grid Ref. | | | |
| 5 | 2 | 1 | 8 |
| 7 | 3 | 1 | 4 |
| LOCALITY | | | |
| Cedwell : Rd Bedford railway line - have neighboring green lanes. | | | |
| Discard railway embankments, scrub, bedrock permanent way, grassy track. | | | |
| SOUTH EAST | | | |
| Date | V.C. No. | | |
| 18/5/77 | 20 | | |
| Herford | | | |
| U.C. No. | | | |
| Cotnam | | | |

| | | | | | | | | | | | | | | | | | |
|-----------|--------|------|------|--------|------|------|----------|--------|------|-------|----------|------|--------|--------|------|---------|------|
| 1191 | Least | ley | 1343 | Nardi | pas | 1514 | Polys | ser | 1697 | Ribes | uva | 1908 | Serra | tin | 2091 | Trifo | pra |
| 1192 | Lapide | can | 1344 | Nardu | str | 1515 | | vul | 1701 | Rorip | sup | 1912 | Sbers | arr | 2092 | | rep |
| 1193 | | rud | 1345 | Narth | oss | 1521 | Polys | amp | 1703 | | tal | 1913 | Siegl | dec | 2094 | | aca |
| 1194 | Ligne | vol | 1346 | Nasta | mic | 1522 | | avi | 1704 | | syi | 1916 | Silau | ail | 2095 | | squ |
| 1147 | Limon | bei | 1347 | | od | 1527 | | bsa | 1705 | Rosa | agg | 1923 | Silen | cuc | 2097 | atrium | mar |
| 1148 | | bin | 1348 | | od | 1527 | | con | 1707 | | arv | 1932 | Sinap | alb | 2101 | Trigi | pal |
| 1149 | | bum | 1349 | o a m | | 1530 | | hyd | 1708 | | *can | 1935 | | arr | 2102 | | fla |
| 1154 | | vul | 1352 | Neotti | nld | 1531 | | lap | 1714 | | *rub | 1934 | Silau | amo | 2103 | Trise | lar |
| 1161 | Liner | rep | 1356 | Nupha | lut | 1536 | | mit | 1719 | | spi | 1933 | Slayun | alt | 2108 | Tunei | ang |
| 1164 | | vul | 1358 | Nymph | alb | 1537 | | nod | 1720 | | sty | 1938 | | off | 2110 | Typha | lat |
| 1168 | Lirura | cat | 1360 | Nymph | pei | 1544 | Polyp | per | 1722 | | *vul | 1938 | | ori | 2111 | | |
| 1173 | Lito | ova | | | | 1544 | Polys | lob | 1728 | Rubus | cae | 1944 | Sium | lat | | | |
| 276 | Litho | arr | 1361 | Odont | ver | 1548 | | set | 1728 | | *fru | 1945 | Smyrn | ole | 2112 | Ulex | cur |
| 1174 | | off | 1362 | Oenan | aqu | 1549 | Popul | alb | 1729 | | lda | 1947 | Solan | dol | 2114 | | min |
| 1182 | Lolia | mul | 1363 | | cro | 1551 | | can | 1735 | Rumex | | 1949 | | nlg | 2119 | Ulmus | glu |
| 1183 | | per | 1364 | | fra | 1554 | | nig | 1736 | | *ace | 1951 | Solid | vir | 2122 | | pro |
| 1186 | Lonic | per | 1365 | | fra | 1554 | | scr | 1734 | | ace | 1952 | Sonch | arv | 2126 | Urtic | *vul |
| 1191 | Lotte | cor | 1366 | | lac | 1555 | | col | 1741 | | acostosa | 1953 | | asp | 2128 | | |
| 1193 | | ten | 1370 | Oenot | ble | 1561 | Potam | cri | 1742 | | crispus | 1954 | | ole | 2132 | | |
| 1194 | | ull | 1375 | Oenot | vic | 1563 | | den | 1745 | | byd | 1957 | Sorbu | *ad | 2136 | Vacc | myr |
| 1201 | Luzul | cam | 1377 | Oenot | rep | 1569 | | luc | 1747 | | mar | 1960 | | suo | 2139 | Valer | dio |
| 1202 | | for | 1378 | | spi | 1570 | | nat | 1748 | | obt | 1961 | | ram | 2140 | | off |
| 1204 | | mul | 1379 | Onopo | aca | 1574 | | pec | 1749 | | pal | 1963 | | sim | 2143 | Valer | den |
| 1207 | | pil | 1381 | Ophio | vul | 1574 | | per | 1751 | | pul | 1968 | Spart | low | 2145 | | loc |
| 1208 | | syi | 1382 | Ophry | api | 1575 | | rol | 1753 | | san | 1124 | Specu | hyb | 2146 | | rim |
| 1210 | Lycha | chl | 610 | Orchi | eri | 1576 | | pra | 1756 | | ten | 1957 | Sperg | arv | 2150 | Verba | nig |
| 1211 | Lyciu | chl | 608 | | fuc | 1577 | | ang | 1760 | Ruscu | acu | 1961 | Sperg | marv | 2157 | thapsus | off |
| 1212 | | hai | 1387 | | mas | 1583 | Poten | ans | 1761 | Sagin | spe | 1992 | | rub | 2159 | Verba | off |
| 1218 | Lycop | arv | 1389 | | mor | 1584 | | arg | 1762 | | cil | 1990 | | sal | 2161 | Veron | agr |
| 1219 | Lycop | eur | 1393 | Origa | vul | 1585 | | era | 1763 | | mar | 1997 | Spira | spi | 2163 | | ana |
| 1221 | Lysim | nem | 1396 | Ornit | umb | 1598 | | pal | 1765 | | nod | 2001 | Stach | arv | 2165 | | arv |
| 1223 | | sum | 1397 | Ornit | per | 1592 | | rep | 1766 | | pro | 2003 | | off | 2166 | | bec |
| 1225 | | vul | 1401 | Oroba | ela | 1594 | | lte | 1767 | | sag | 2005 | | pal | 2167 | | cat |
| 1227 | Lythr | sal | 1404 | | min | 1596 | | tab | 1771 | Sagit | agg | 2007 | Stell | als | 2171 | | had |
| 1228 | Maboa | aqu | 1424 | Papav | arg | 1598 | Poter | pol | 2242 | Salic | alb | 2008 | | ape | 2172 | | mon |
| 1230 | Malva | syi | 1426 | | dub | 1599 | | san | 1784 | Salix | aur | 2008 | | gra | 2173 | | off |
| 1232 | Malva | nuc | 1427 | | hyb | 1600 | Primu | ela | 1788 | | *cap | 2010 | | bol | 2178 | | per |
| 1233 | | neg | 1430 | | roo | 1605 | | ver | 1789 | | *can | 2011 | | *med | 2178 | | pol |
| 1236 | | syi | 1435 | Parie | dif | 1607 | | vul | 1793 | | fra | 2012 | | med | 2179 | | acu |
| 1238 | Marru | vul | 1436 | Paris | qua | 1610 | Prone | vul | 1801 | | pur | 2013 | | neg | 2180 | | scr |
| 1239 | Matri | cha | 1437 | Paria | pal | 1611 | Prone | avi | 1802 | | rep | 2015 | | pal | 2184 | Vibor | lan |
| 1241 | | mar | 1440 | Pastl | sat | 1614 | | dora | 1804 | | tri | 2018 | Sued | fru | 2185 | | opt |
| 1242 | | mat | 1441 | Pedlo | pal | 1616 | | ped | 1805 | | vim | 2019 | | mar | 2186 | Vicia | ang |
| 1247 | Medio | ara | 1442 | | syi | 1617 | | spi | 1806 | Salso | kal | 2021 | Succi | pra | 2188 | | gra |
| FOLD HERE | | | | | | | | | | | | | | | | | |
| 1248 | | lal | 1443 | Penta | sem | 1618 | Pteri | aqu | 1809 | Salvi | hor | 2024 | Symph | off | 2191 | | hir |
| 1249 | | his | 1444 | Pepil | por | 1620 | Pucci | dis | 1814 | Sambu | ebu | | | | 2194 | | lat |
| 1250 | | lup | 1446 | Petas | fra | 1622 | | mar | 1815 | | nig | 2032 | Famus | com | 2197 | | sat |
| 1252 | | sat | 1447 | | hyb | 1625 | Pulic | dys | 1817 | Samol | val | 2033 | Tanac | vul | 2198 | | sep |
| 1253 | | var | 1450 | Petro | seg | | | | 1818 | Sangu | off | 2034 | Taras | *agg | 2201 | tenus | |
| 1256 | Meiana | pra | 1453 | Proce | pal | 1638 | Querc | pet | 1819 | Sanio | eur | 2036 | | *las | 2202 | | tet |
| 1258 | Meian | alb | 1454 | Phlea | are | 1640 | | reb | 1821 | Sapon | off | 2035 | | *off | 2204 | Vinea | maj |
| 1261 | | noc | 1459 | Phlea | are | 1641 | Radio | lin | 1822 | Sarot | sco | 2039 | Taxus | bae | 2205 | | min |
| 1263 | | rub | 1461 | | nod | 1641 | Ranun | scr | 1830 | Saxil | gra | 2041 | Teesd | oud | 2206 | Viola | arv |
| 1265 | Mello | uni | 2247 | | *pra | 1642 | | aqu | 1843 | | tri | 2048 | Taur | | 2207 | | can |
| 1264 | Mellu | alb | 1483 | | pra | 1643 | | arv | 1846 | Scati | onj | | | scored | 2210 | | hir |
| 1265 | | alt | 1485 | Phrug | com | 1644 | | arv | 1847 | Scand | pec | 2048 | Thali | fla | 2214 | | odo |
| 1267 | | off | 1486 | Phyll | sco | 1645 | | aur | 1851 | Schoe | lac | 2049 | | min | 2215 | | pal |
| 1272 | Menth | aqu | 1471 | Picri | ech | 1647 | | bul | 1852 | | tab | 2052 | Thely | pal | 2217 | | rel |
| 1273 | | arv | 1472 | | hie | 1648 | | cir | 1853 | Schoe | nig | 2058 | Thlas | arv | 2218 | | riv |
| 1280 | Menya | tri | 1475 | Pimpi | maj | 1649 | | tic | 1860 | Scirp | mar | 2060 | Thymu | dru | 2220 | | tri |
| 1290 | Mercu | ann | 1476 | | sax | 1651 | damnuila | | 1861 | | syi | 2061 | | pul | 2223 | Vinea | alb |
| 1291 | | per | 1481 | Pingu | vul | 1652 | | flu | 1862 | Scler | ann | 2063 | Tilla | cor | 2225 | Vulpi | amb |
| 1296 | Milla | eff | 1484 | Pinus | syi | 1653 | | bed | 1863 | Scrop | aqu | 2064 | | pia | 2226 | | bro |
| 1308 | Minua | ten | 1485 | Mant | cor | 1654 | | len | 1867 | | nod | 2065 | | vul | 2227 | | mem |
| 1306 | Moebr | tri | 1487 | | lan | 1659 | | par | 1872 | Scute | gal | 2067 | Tilla | nus | 2228 | | myr |
| 1307 | Molli | cae | 1488 | | maj | 1660 | | repens | 1873 | Sedum | scr | 2068 | Toril | arv | | | |
| 1312 | Monti | *fon | 1489 | | mar | 1662 | | sar | 1877 | | ang | 2069 | | jap | 2237 | Zanni | pal |
| 1315 | Mycei | mur | 1490 | | med | 1663 | | ace | 1881 | | ref | 2070 | | nod | 223 | Zerna | cre |
| 1317 | Myoso | arv | 1492 | Plata | bi | 1664 | | tri | 1883 | | tel | 2074 | Trago | pra | 273 | | ram |
| 1319 | | cae | 1493 | | chl | 1667 | Rapba | rap | 1891 | Sense | aqu | 1858 | Trich | cae | | | |
| 1321 | | dis | 1495 | Poa | ann | 1672 | Reaed | lut | 1896 | | eru | 2077 | Trifo | arv | | | |
| 1329 | | his | 1499 | | oom | 1673 | lutola | | 1898 | | int | 2080 | | cam | | | |
| 1322 | | pal | 1504 | | nem | 1675 | Rhamu | cat | 1899 | | jac | 2081 | | dub | | | |
| 1328 | Myoso | aqu | 1506 | | pra | 1678 | Rhina | *mun | 1902 | | aqu | 2083 | | fra | | | |
| 1329 | Myrio | gal | 1507 | | tri | 1691 | Rhync | alb | 1903 | | syi | 2087 | | med | | | |
| 1331 | Myrio | spi | 1512 | Polys | cal | 1694 | Ribes | nig | 1904 | | vis | 2088 | | mic | | | |
| 1332 | | ver | 1513 | oxy | | 1696 | | syi | 1905 | | vul | 2090 | | och | | | |

Other Species
Salix sp. (hybrid) - planted, 1968.
Populus

* in river.

Hiz, Oughton and Purwell River Corridor Sections Grid References (All TL)

| Code | Downstream | Upstream | Notes |
|------------------------------|------------|----------|--|
| Hiz and Purwell to branching | | | |
| PUR 001 | 187326 | 187322 | As CIVE 007 opposite way (River Hiz) |
| PUR 002 | 187322 | 185317 | As CIVE 006 opposite way (River Hiz) |
| PUR 003 | 185317 | 186313 | As CIVE 005 opposite way (River Hiz) |
| PUR 004 | 186313 | 187308 | As CIVE 004 opposite way (River Hiz) |
| PUR 005 | 187308 | 190305 | As CIVE 003 opposite way (River Hiz) |
| PUR 006 | 190305 | 195303 | As CIVE 002 opposite way (River Hiz/Purwell) |
| PUR 007 | 195303 | 197299 | As CIVE 001 opposite way (River Purwell) |
| PUR 008 | 197299 | 201296 | Pool and two branches of river (River Purwell) |
| PUR 009 | 210296 | 204293 | (River Purwell) |
| Willian Branch of Purwell | | | |
| PUR 010 | 204293 | 208295 | |
| PUR 011 | 208295 | 211297 | ends off river |
| PUR 012 | 209297 | 211302 | |
| PUR 013 | 211302 | 214306 | |
| PUR 014 | 214306 | 216312 | |
| PUR 015 | 212304 | 217307 | ends off river |
| PUR 016 | 215306 | 219303 | |
| PUR 017 | 219303 | 223306 | |
| PUR 018 | 221303 | 224301 | |
| Ash Brook (of Purwell) | | | |
| PUR 019 | 204293 | 206288 | |
| PUR 020 | 204291 | 202286 | |
| PUR 021 | 202286 | 203282 | |
| PUR 022 | 203282 | 201277 | |
| PUR 023 | 201277 | 200272 | |
| PUR 024 | 200272 | 204274 | |
| PUR 025 | 204274 | 208275 | |
| PUR 026 | 208275 | 213274 | |
| St Ipps Brook (of Purwell) | | | |
| PUR 027 | 202286 | 198284 | |
| PUR 028 | 198284 | 195281 | |
| PUR 029 | 195281 | 194275 | |
| PUR 030 | 194275 | 196271 | |
| PUR 031 | 195268 | 196266 | |
| PUR 032 | 196266 | 198262 | |
| PUR 033 | 198262 | 202260 | |
| PUR 034 | 198262 | 198259 | |

Extension of Purwell (St Ipps Brook) to Knebworth Woods

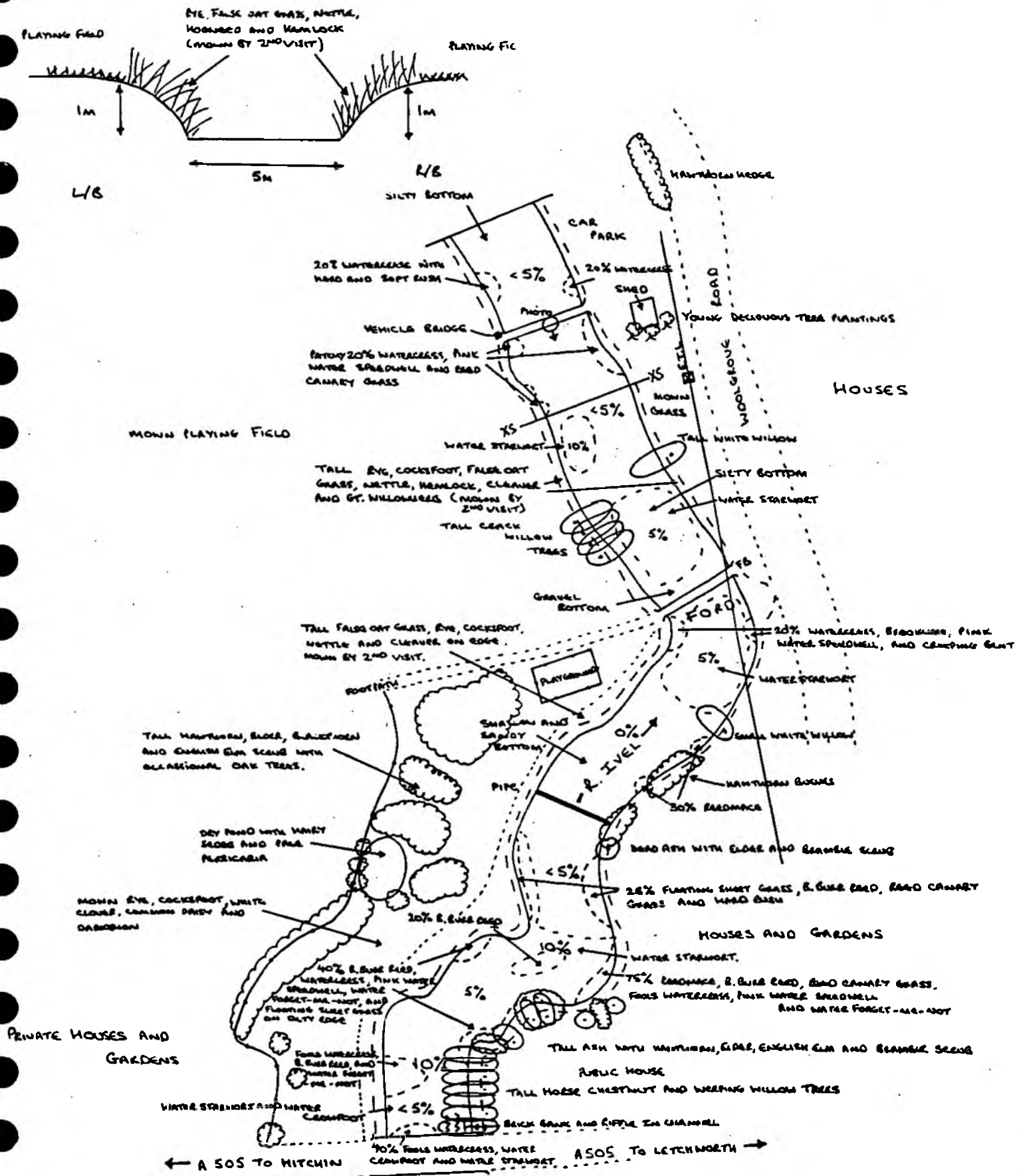
| | | |
|---------|--------|--------|
| PUR 035 | 205246 | 207242 |
| PUR 036 | 207242 | 211237 |
| PUR 037 | 211237 | 215234 |
| PUR 038 | 215234 | 220231 |

Hiz after branching from Purwell

| | | |
|---------|--------|--------|
| HIZ 001 | 191304 | 189300 |
| HIZ 002 | 189300 | 186295 |
| HIZ 003 | 186295 | 185291 |
| HIZ 004 | 185291 | 183287 |
| HIZ 005 | 183287 | 180284 |
| HIZ 006 | 180284 | 179280 |
| HIZ 007 | 179280 | 174275 |

Oughton after branching from Hiz

| | | |
|---------|--------|--------|
| OUG 001 | 184314 | 182312 |
| OUG 002 | 182312 | 178310 |
| OUG 003 | 178310 | 173308 |
| OUG 004 | 173308 | 169305 |
| OUG 005 | 169305 | 166303 |
| OUG 006 | 166303 | 163299 |
| OUG 007 | 163299 | 161299 |
| OUG 008 | 169305 | 169301 |
| OUG 009 | 169301 | 168300 |



CIVE 001

Plant Communities

A narrow river section, tightly meandering upstream and straight downstream. The A505 road bridge forms the upstream boundary, with a mid-section footbridge and ford and a downstream vehicle bridge. The left side has an area of amenity grassland and scrub and open playing fields. The right side has private housing, a road, and wide, mown verge of amenity grassland with a car park.

The left bank, upstream is open, except for a short stretch of crack willow trees and dominated by perennial rye grass, false oat grass, nettle, hemlock, cleavers and great willowherb, which was again mown by the second visit.

The right bank upstream is heavily shaded by tall horse chestnut, willow and ash, trees with hawthorn, elder, English elm, and bramble scrub. Beyond gardens with occasional willow, elder, hawthorn and English elm bushes, the bank downstream is open with one white willow over perennial rye grass, cock's-foot, false oat-grass, nettle, hemlock and great willowherb, mown by the second visit.

The branched bur-reed, reed canary grass, reedmace, pink water speedwell, brooklime, floating sweet grass, hard rush, soft rush, water forget-me-not, creeping bent and fool's water-cress of both fringes is infrequent and patchy.

Water starwort occurs throughout the section and with fool's water-cress and water crowfoot gives up to 40% cover.

80 species recorded.

Birds

18 species were recorded. Of these, 12 species (Mallard, Moorhen, Collared Dove, Wren, Dunnock, Blackbird, Song Thrush, Blue Tit, Great Tit, Starling, Chaffinch and Greenfinch) probably held breeding territories which included the river corridor and 6 species (Woodpigeon, House Martin, Rook, House Sparrow, Goldfinch and Linnet) fed in the corridor but bred elsewhere.

The main habitats for birds include the patches of tall scrub set back from the left bank and tall trees scattered along the right bank, both habitats being restricted to the stretch above the first footbridge.

Management suggestions

CIVE 001

Dredge out left side pond - involve Herts and Middlesex
Wildlife trust and/or local schools.

RIVER CODE CIVE 00
Survey Year 1990.

DATA ON FLUVIAL GEOMORPHOLOGY

GENERAL FORM:

Braided Meandering ✓ Straight (tick one)
Steep Moderate ✓ Low ✓
(falls) (riffle/pool sequence) (ponded lengths with no steps) (tick one)

Fixed Heads in Section 0

No. of Riffles in Section: — 1

Weirs, narrow bridges, rock outcrops and other physical features can act as fixed heads along a river course, maintaining an extensive ponded area, with little evidence of more natural physical processes. This is especially true in low lying fenland areas and navigable lengths, where many rivers are effectively elongated pools with a fixed level (head) at the downstream end controlled by a structure, such as a weir or the foundations of a bridge. These need to be clearly marked on each map.

Photographs: for each 500 m section a photo should be taken to indicate general form, and if relevant also any specific prominent fluvial features.

DIMENSIONS:

Widths: i. Current Wetted channel width — 4-5m.
ii. Bankful channel width — 5m.
iii. Flood capacity channel width (where there are raised banks on either side), including berms —

Depth: 5cm - 1/2m

Flow: FAST TO SLOW

RIVER BED SEDIMENTS AND RIVER BANK SEDIMENTS:

For both bed and bank sediments, an assessment should be made in broad terms and reported as approximate percentages as below. A separate table will be required for bed and for bank sediments.

| | RIVER BANK | RIVER BED |
|-----------|------------|-----------|
| Boulders | 2 | 5 |
| Cobble | 2 | |
| Gravel | 2 50 | 15 |
| Sand | 2 | 20 |
| Silt/clay | 2 50 | 60 |



CIVE 002

Plant Communities

A narrow, meandering river section culverted under a mid-section railway line and a downstream road. The left side land use is playing field, railway embankment, works and private housing. The right side has mown amenity grass, a sports hall, railway embankment, works and private housing.

The left bank upstream has scattered crack willow trees and grey willow bushes over couch, false oat-grass, cleavers, hemlock, hogweed and nettle. Between the two culverts the bank is inaccessible with tall bramble, false oat-grass, cock's-foot, nettle, cleavers and creeping thistle, and a patch of dense yew, sycamore elder and blackthorn scrub. Downstream the bank is up to 3m high and fenced along the top with tall lawson cypress trees, sycamore and elder scrub and a white willow tree shading the channel over nettle, cleavers, garlic mustard and greater celandine. The fringe comprises infrequent patches of branched bur-reed, hard rush and soft rush.

The right bank upstream is predominantly open and dominated by couch, false oat-grass, cleavers, nettle, hemlock and cow parsley with crack and white willow trees shading a short stretch in mid-section. Immediately downstream of the railway bridge the bank is tall, with English elm and elder scrub; further downstream gardens run down to the river. Downstream of the road bridge the bank is shaded by the sycamore, horse chestnut, ash and Italian poplar trees with elder and snowberry over sterile brome, nettle, cleavers, cow parsley and garlic. The fringe has a little hard rush, soft rush, water-cress, water forget-me-not and reed canary grass.

Channel vegetation consists of one upstream patch of water starwort and a stand of branched bur-reed in mid-section, giving cover, with the fringes, up to 50%.

77 species recorded.

CIVE 002

Birds

19 species were recorded. Of these, 18 species (Mallard, Moorhen, Woodpigeon, Grey Wagtail, Wren, Dunnock, Robin, Blackbird, Song Thrush, Blackcap, Willow Warbler, Blue Tit, Great Tit, House Sparrow, Chaffinch, Greenfinch, Goldfinch and Linnet) probably held breeding territories which included the river corridor and one species (Swift) fed in the corridor but bred elsewhere.

The main habitats for birds include the willow bushes and trees along the left bank above the railway; dense bushes on both sides of the railway line; willows and dense brambles on the left bank between the railway and Grove Road, and trees and bushes along the right bank below Grove Road.

Other

Little Grebe recorded on 29 May.

RIVER CODE CIVE 00
Survey Year 1990.

DATA ON FLUVIAL GEOMORPHOLOGY

GENERAL FORM:

Braided Meandering ✓ Straight (tick one)
Steep (falls) Moderate (riffle/pool sequence) ✓ Low (ponded lengths with no steps) ✓ (tick one)

Fixed Heads in Section 2 No. of Riffles in Section: — ≈ 2.

Weirs, narrow bridges, rock outcrops and other physical features can act as fixed heads along a river course, maintaining an extensive ponded area, with little evidence of more natural physical processes. This is especially true in low lying fenland areas and navigable lengths, where many rivers are effectively elongated pools with a fixed level (head) at the downstream end controlled by a structure, such as a weir or the foundations of a bridge. These need to be clearly marked on each map.

Photographs: for each 500 m section a photo should be taken to indicate general form, and if relevant also any specific prominent fluvial features.

DIMENSIONS:

Widths: i. Current Wetted channel width — 3-5m.
ii. Bankful channel width — up to 6m
iii. Flood capacity channel width (where there are raised banks on either side), including berms —

Depth: 5cm - 1/2m

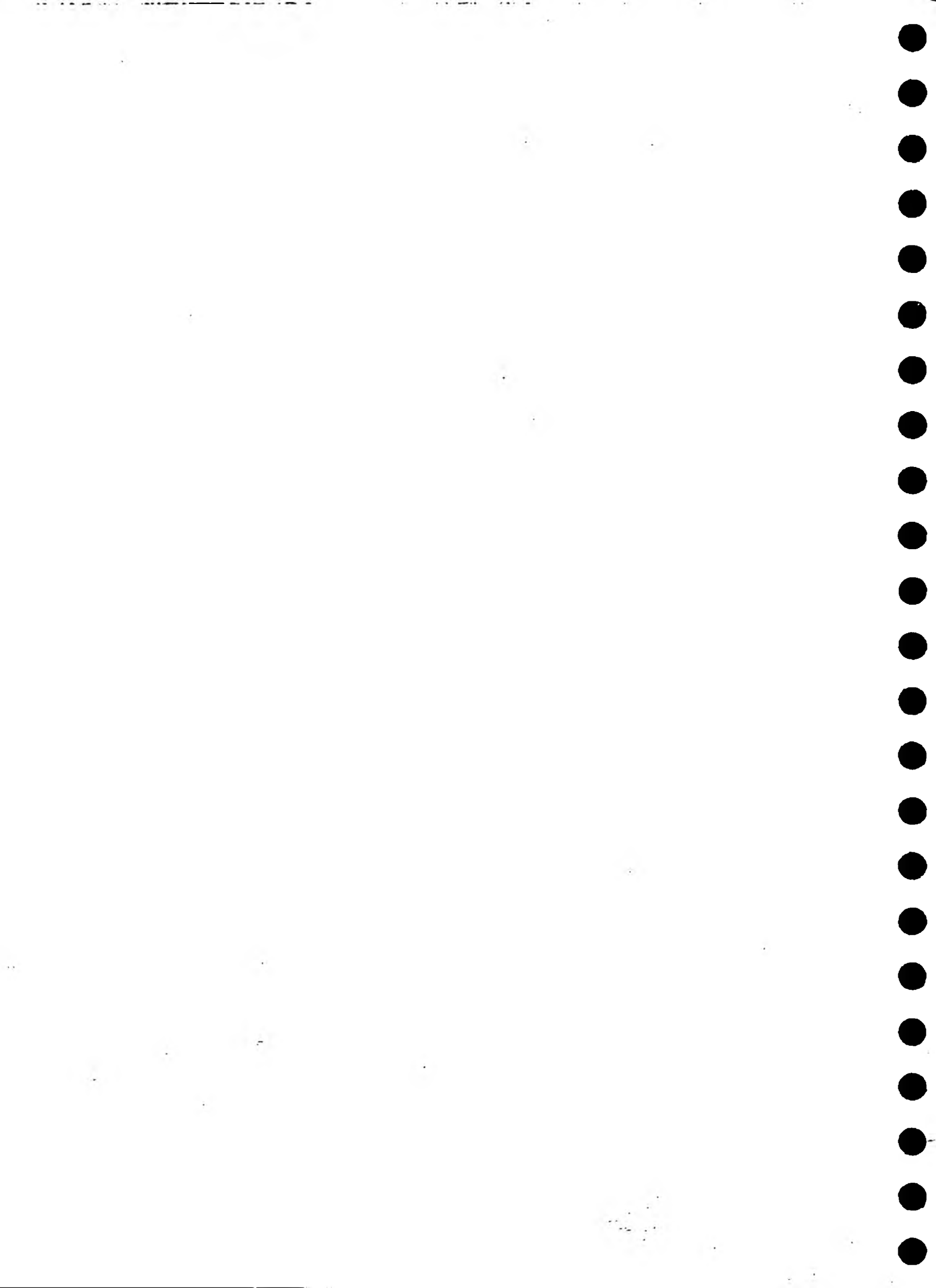
Flow: SLOW TO FAST

RIVER BED SEDIMENTS AND RIVER BANK SEDIMENTS:

For both bed and bank sediments, an assessment should be made in broad terms and reported as approximate percentages as below. A separate table will be required for bed and for bank sediments.

| | RIVER BANK | RIVER BED |
|-----------|------------|-----------|
| Boulders | 2 | 5 |
| Cobble | 2 | |
| Gravel | 2 50 | 20 |
| Sand | 2 | |
| Silt/clay | 2 50 | 75 |





Plant Communities

A narrow, meandering river section crossed by a railway bridge toward the downstream end. The land use on the left is private houses, scrub covered railway embankment and Hitchen sewage treatment works. On the right is playing fields, small industrial works, railway embankment and a breakers yard.

The left bank upstream has scattered elder, hawthorn, rose and willow scrub and tall conifer trees over tall false oat-grass, sterile brome, nettle, great willowherb and bramble. The mid-section has the heavy shade of ash and white willow trees and hawthorn scrub over tall nettle, garlic mustard and great willowherb. The downstream bank is fenced with willow and elder scrub over tall nettle, cleavers and bramble.

The right bank upstream is dominated by tall sycamore, alder, crack willow scrub over nettle, cleavers, garlic mustard, clustered dock and bramble. Below this the bank is steep sided with scattered lombardy poplar, Italian poplar, ash and sycamore trees with elder, hawthorn, rose and bramble scrub over tall false oat-grass, cock's-foot, nettle, great willowherb and cleavers. The low downstream bank has occasional elder and willow bushes with tall common reed, false oat-grass, great willowherb, nettle and bramble.

Both fringes include branched bur-reed, reedmace, reed canary grass, fool's water-cress, yellow iris, water-cress and water forget-me-not, sometimes extending well into the channel.

Unbranched bur-reed, water crowfoot and water starwort occurs downstream giving, with the fringes, 20-50% cover.

93 species recorded.

Birds

23 species were recorded. Of these, 17 species (Woodpigeon, Wren, Dunnock, Robin, Blackbird, Song Thrush, Sedge Warbler, Whitethroat, Blackcap, Chiffchaff, Willow Warbler, Blue Tit, Great Tit, Starling, Chaffinch, Greenfinch and Bullfinch) probably held breeding territories which included the river corridor and 6 species (Mallard, Grey Wagtail, Magpie, Rook, House Sparrow and Goldfinch) fed in the corridor but bred elsewhere.

The main habitats for birds include the bramble scrub and nettles along the left bank above the railway; dense tall scrub along the railway embankment, and willow bushes along the left bank downstream of the railway.



DATA ON FLUVIAL GEOMORPHOLOGY

GENERAL FORM:

Braided Meandering ✓ Straight ✓ (tick one)
Steep (falls) Moderate (riffle/pool sequence) ✓ Low (ponded lengths with no steps) ✓ (tick one)

Fixed Heads in Section | No. of Riffles in Section: — ≈ 2.

Weirs, narrow bridges, rock outcrops and other physical features can act as fixed heads along a river course, maintaining an extensive ponded area, with little evidence of more natural physical processes. This is especially true in low lying fenland areas and navigable lengths, where many rivers are effectively elongated pools with a fixed level (head) at the downstream end controlled by a structure, such as a weir or the foundations of a bridge. These need to be clearly marked on each map.

Photographs: for each 500 m section a photo should be taken to indicate general form, and if relevant also any specific prominent fluvial features.

DIMENSIONS:

Widths: i. Current Wetted channel width — 3-4m
ii. Bankful channel width — UP TO 6m
iii. Flood capacity channel width (where there are raised banks on either side), including berms —

Depth: UP TO 30cm

Flow: SLOW TO FAST

RIVER BED SEDIMENTS AND RIVER BANK SEDIMENTS:

For both bed and bank sediments, an assessment should be made in broad terms and reported as approximate percentages as below. A separate table will be required for bed and for bank sediments.

| | RIVER BANK | RIVER BED |
|-------------------|------------|-----------|
| Boulders/BRICKS % | | 5 |
| Cobble % | | |
| Gravel % | 50 | 45 |
| Sand % | | |
| Silt/clay % | 50 | 50 |



CIVE 004

Plant Communities

A narrow, meandering river section. On the left is an area of tall willow trees and herbage, allotments and arable; on the right a fenced breakers yard, rough grassland and a willow plantation.

The left bank is fenced upstream and dominated by tall nettle, cleavers, comfrey and great willowherb. Through the mid-section the high bank is dominated by tall couch, sterile brome, nettle, hogweed and cleavers, growing on allotment rubbish under a line of live and dead Italian poplars. The bank downstream has a little hawthorn scrub and a few small ash over the same species. The fringe of branched bur-reed and fool's water-cress forms extensive patches upstream, elsewhere it is patchy.

The right bank upstream is dominated by tall nettle, comfrey, great willowherb, false oat-grass and cleavers, with a little hawthorn and elder scrub. The mid-section is wetter, with reed canary grass, common reed, nettle, broad-leaved dock and cleavers and an area of extensive hawthorn and elder. The bank downstream has scattered hawthorn, elder, ash, rose and osier bushes over tall false oat-grass, sterile brome, reed canary grass, cleavers, great willowherb and water figwort. The fringe of branched bur-reed is restricted to one large upstream stand.

Water crow foot and water starwort occur throughout the section, with unbranched bur-reed and curled pondweed, along with the extensive upstream branched bur-reed fringe gives up to 40% cover.

79 species recorded.

Birds

18 species were recorded. Of these, 15 species (Mallard, Turtle Dove, Grey Wagtail, Wren, Dunnock, Blackbird, Sedge Warbler, Blackcap, Chiffchaff, Willow Warbler, Blue Tit, Great Tit, House Sparrow, Chaffinch and Greenfinch) probably held breeding territories which included the river corridor and 3 species (Moorhen, Woodpigeon and Song Thrush) fed in the corridor but bred elsewhere.

The main habitats for birds include the dense comfrey and nettles along both banks at the upstream end; scattered willows and poplars mainly along the left bank and two sections of hedge - one along the downstream part of the left bank and the other joining the mid-section of the right bank.

DATA ON FLUVIAL GEOMORPHOLOGY

GENERAL FORM:

Braided Meandering ✓ Straight ✓ (tick one)

Steep (falls) Moderate (riffle/pool sequence) ✓ Low ~~✓~~ (ponded lengths with no steps) (tick one)

Fixed Heads in Section 0

No. of Riffles in Section: — ^{COVERING UP TO} 80% OF CHANNEL

Weirs, narrow bridges, rock outcrops and other physical features can act as fixed heads along a river course, maintaining an extensive ponded area, with little evidence of more natural physical processes. This is especially true in low lying fenland areas and navigable lengths, where many rivers are effectively elongated pools with a fixed level (head) at the downstream end controlled by a structure, such as a weir or the foundations of a bridge. These need to be clearly marked on each map.

Photographs: for each 500 m section a photo should be taken to indicate general form, and if relevant also any specific prominent fluvial features.

DIMENSIONS:

Widths: i. Current Wetted channel width — 3-4m.
ii. Bankful channel width — 4m-
iii. Flood capacity channel width (where there are raised banks on either side), including berms —

Depth: 5cm - 30cm

Flow: SLOW TO FAST

RIVER BED SEDIMENTS AND RIVER BANK SEDIMENTS:

For both bed and bank sediments, an assessment should be made in broad terms and reported as approximate percentages as below. A separate table will be required for bed and for bank sediments.

| | RIVER BANK | RIVER BED |
|-----------|------------|-----------|
| Boulders | % | |
| Cobble | % | |
| Gravel | % 50 | 50 |
| Sand | % | 10 |
| Silt/clay | % 50 | 40 |

CIVE 004



Plant Communities

A meandering river section. The River Oughton has a split channel confluence with the section at the upstream end. Further downstream a vehicle bridge and footbridge cross the section. On the left is arable, rough semi-improved grassland, private houses, arable and more housing. On the right is a white willow plantation and fenced amenity grassland. A derelict scrub covered railway embankment forms the downstream boundary.

The left bank upstream spans the River Oughton confluence, where it is dominated by tall couch, sterile brome, false oat-grass, nettle and cleavers. An island at the mouth on the Oughton is shaded by white willow, ash, alder and sycamore trees and hawthorn, willow and elder scrub over false oat-grass, cock's-foot, great willowherb, nettle, creeping thistle and bramble. In mid-section the bank has frequent hawthorn, English elm and elder scrub with occasional Italian poplar and ash trees over false oat-grass, couch, cock's-foot, timothy and ribwort plantain. Downstream of the vehicle bridge ash, grey willow, hawthorn and elder bushes shade the bank, with white willow trees, bordering the private gardens. There is a patchy fringe of branched bur-reed and water-cress occasionally spanning the channel.

The right bank upstream has scattered elder, hawthorn, grey willow and white willow over false oat-grass, cock's-foot, nettle, cleavers, hogweed and great willowherb. Downstream of the footbridge the bank is fenced with occasional sycamores and a little elder, guelder rose and silver birch scrub. The railway embankment is dominated by hawthorn, elder and blackthorn scrub with lombardy poplar and ash trees. The fringe of branched bur-reed is extensive in mid-section but very patchy elsewhere.

The upstream arm of the River Oughton has patchy branched bur-reed. A pool, formed by the derelict sluice system has up to 70% reed sweet grass, reed canary grass, great willowherb and water dock. The downstream branch of the channel is heavily shaded with a reed sweet grass and branched bur-reed stand. Great tussock sedge occurs on the shallow right side bank.

Dnbranched bur-reed, fennel-leaved pondweed, water crowfoot, broad-leaved pondweed, Canadian pondweed and water starwort with the mid-section branched bur-reed fringe gives up to 30% channel cover.

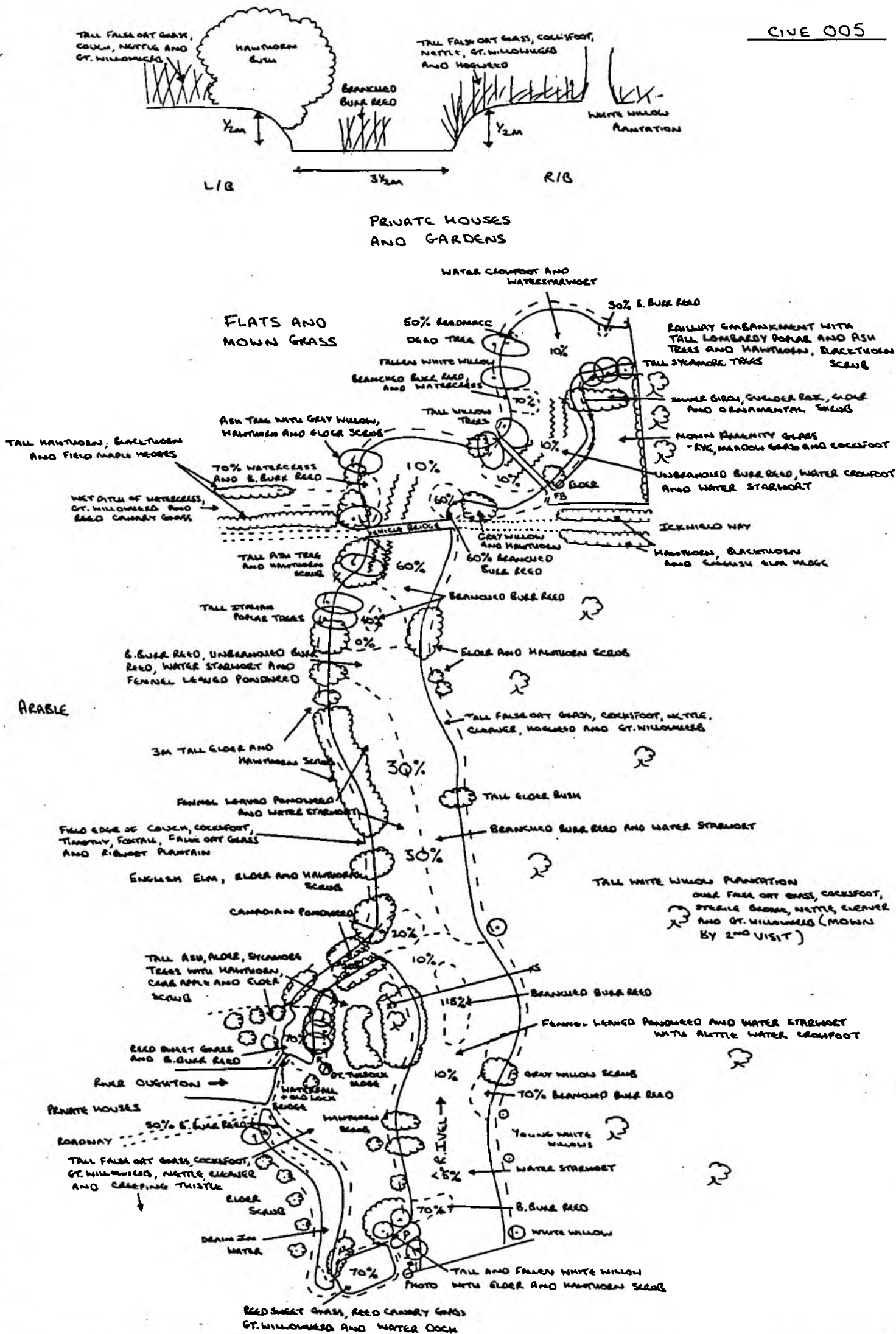
99 species recorded.

CIVE 005

Birds

27 species were recorded. Of these, 25 species (Little Grebe, Mallard, Moorhen, Stock Dove, Woodpigeon, Collared Dove, Wren, Dunnock, Robin, Blackbird, Song Thrush, Sedge Warbler, Reed Warbler - two pairs, Whitethroat, Garden Warbler, Chiffchaff, Willow Warbler, Long-tailed Tit, Blue Tit, Great Tit, Starling, House Sparrow, Chaffinch, Greenfinch and Reed Bunting) probably held breeding territories which included the river corridor and 2 species (Grey Wagtail and Pied Wagtail) fed in the corridor but bred elsewhere.

The main habitats for birds include dense brambles and bushes on the left bank near the junction with the branch from the Mill; emergent vegetation in mid-section; a dense hedge on the south side of the playground opposite Icknield Close and dense tall scrub on the railway embankment at the northern end.



RIVER CODE CIVE 005
Survey Year 1990.

DATA ON FLUVIAL GEOMORPHOLOGY

GENERAL FORM:

Braided Meandering ✓ Straight (tick one)
Steep (falls) Moderate (riffle/pool sequence) ✓ Low (ponded lengths with no steps) ✓ (tick one)

Fixed Heads in Section 0 No. of Riffles in Section: — 2.

Weirs, narrow bridges, rock outcrops and other physical features can act as fixed heads along a river course, maintaining an extensive ponded area, with little evidence of more natural physical processes. This is especially true in low lying fenland areas and navigable lengths, where many rivers are effectively elongated pools with a fixed level (head) at the downstream end controlled by a structure, such as a weir or the foundations of a bridge. These need to be clearly marked on each map.

Photographs: for each 500 m section a photo should be taken to indicate general form, and if relevant also any specific prominent fluvial features.

DIMENSIONS:

Widths: i. Current Wetted channel width — 3-4m.
ii. Bankful channel width — 4m
iii. Flood capacity channel width (where there are raised banks on either side), including berms —

Depth: 10cm - 30cm

Flow: SLOW TO FAST

RIVER BED SEDIMENTS AND RIVER BANK SEDIMENTS:

For both bed and bank sediments, an assessment should be made in broad terms and reported as approximate percentages as below. A separate table will be required for bed and for bank sediments.

| | RIVER BANK | RIVER BED |
|-----------|------------|-----------|
| Boulders | z | |
| Cobble | z | |
| Gravel | z 50 | 40 |
| Sand | z | |
| Silt/clay | z 50 | 60 |



CIVE 006

Plant Communities

A meandering river section. On the left are private houses, gardens and semi-improved pasture. On the right is grazed, semi-improved pasture with a parallel soak drain and arable land beyond.

The left bank gardens have frequent weeping, white and crack willow trees with ornamental and mown lawns. Downstream the bank edge is fenced, with tall false oat-grass, reed canary grass, nettle, great willowherb, bramble and a little hawthorn and elder scrub. There is a patchy fringe of reed canary grass, water-cress, branched bur-reed, yellow iris, reed sweet grass and greater pond sedge.

The right bank is fenced throughout, with a small drinking bay downstream. Tall false oat-grass, reed canary grass, nettle, great willowherb and water figwort dominate, with scattered hawthorn, elder, osier, dogweed and rose scrub. The fringe is patchy, with a very little water-cress, branched bur-reed and reed-mace.

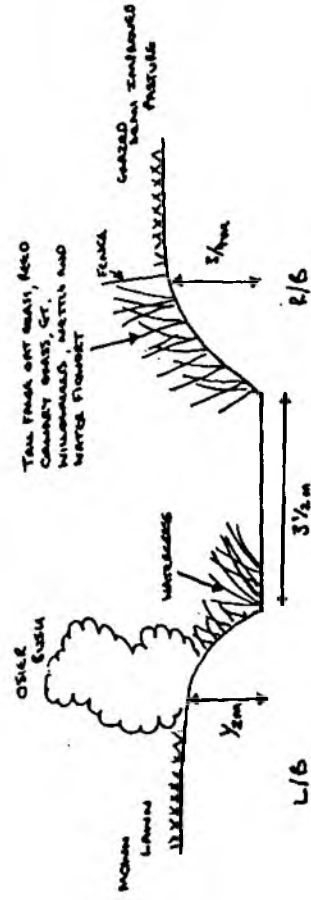
Water crowfoot, water starwort and fennel-leaved pondweed give up to 10% channel cover.

91 species recorded.

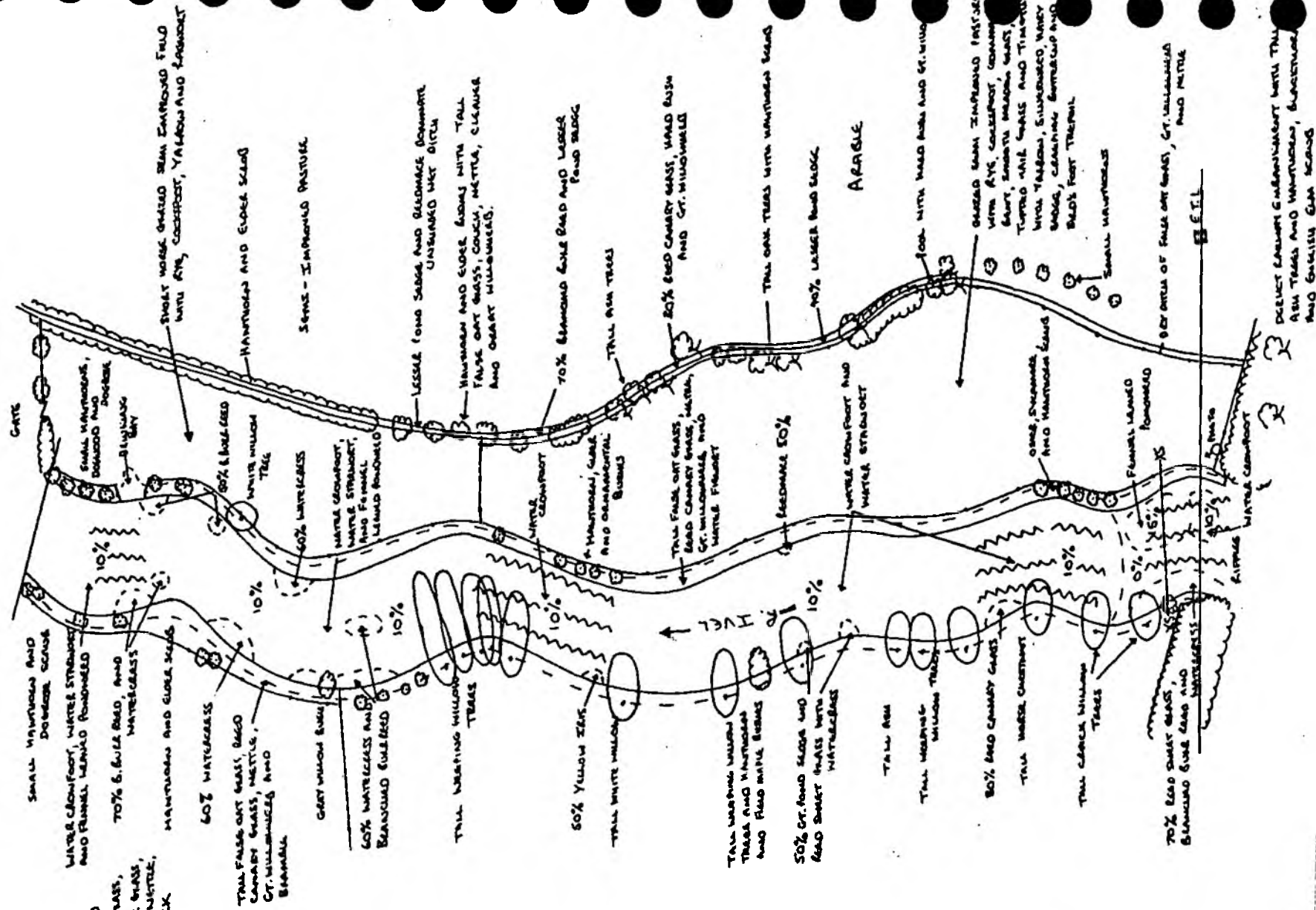
Birds

17 species were recorded. Of these, 12 species (Little Grebe, Mallard, Moorhen, Collared Dove, Grey Wagtail, Wren, Dunnock, Robin, Blackbird, Song Thrush, Blue Tit and Greenfinch) probably held breeding territories which included the river corridor and 5 species (Woodpigeon, Swallow, Long-tailed Tit, Magpie and Goldfinch) fed in the corridor but bred elsewhere.

The main habitats for birds include trees and scrub along the old railway embankment; willows and bramble scattered along the left bank and patches of bramble and bushes near the downstream end.



TAN SOON ENLARGED
PASTURE ON FAUCI ART GRASS,
COLEFOOT, TURTLE WIRE GRASS,
TIMOTHY, WARD BUSH, WATTLE,
AND SAND LENSSED DOCK.



PRIVATE HOUSES
AND GARDENS

DATA ON FLUVIAL GEOMORPHOLOGY

GENERAL FORM:

Braided Meandering ✓ Straight (tick one)
Steep (falls) Moderate (riffle/pool sequence) ✓ Low (ponded lengths with no steps) (tick one)

Fixed Heads in Section 0 No. of Riffles in Section: — 4.

Weirs, narrow bridges, rock outcrops and other physical features can act as fixed heads along a river course, maintaining an extensive ponded area, with little evidence of more natural physical processes. This is especially true in low lying fenland areas and navigable lengths, where many rivers are effectively elongated pools with a fixed level (head) at the downstream end controlled by a structure, such as a weir or the foundations of a bridge. These need to be clearly marked on each map.

Photographs: for each 500 m section a photo should be taken to indicate general form, and if relevant also any specific prominent fluvial features.

DIMENSIONS:

Widths: i. Current Wetted channel width — 3-4m.
ii. Bankful channel width — 4-5m
iii. Flood capacity channel width (where there are raised banks on either side), including berms —

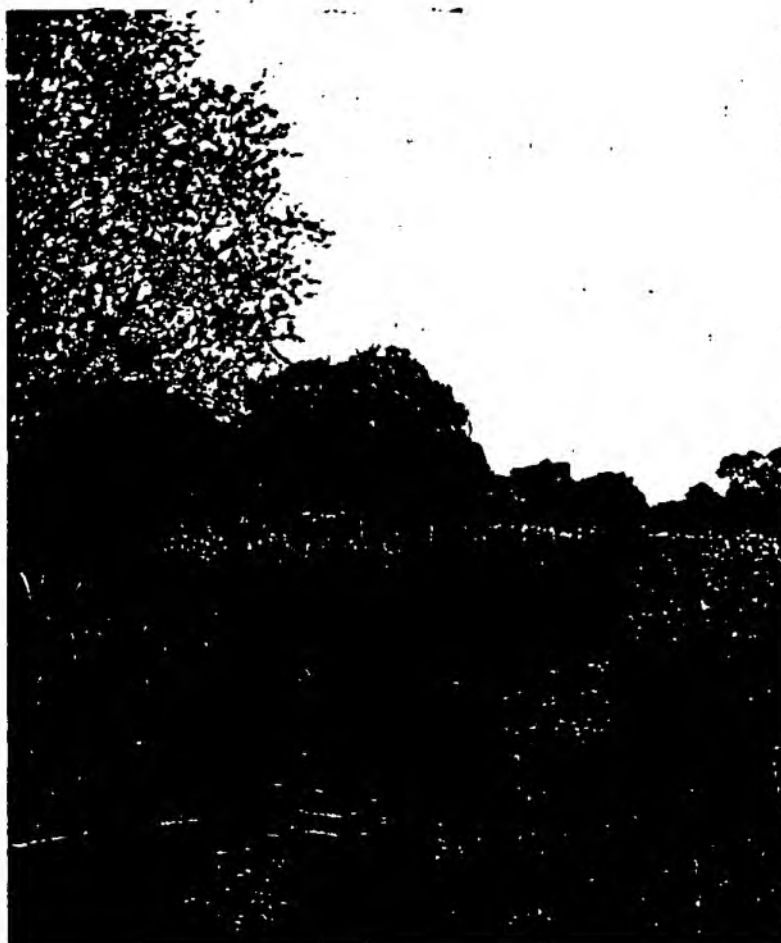
Depth: 5cm - 1/2m

Flow: FAST.

RIVER BED SEDIMENTS AND RIVER BANK SEDIMENTS:

For both bed and bank sediments, an assessment should be made in broad terms and reported as approximate percentages as below. A separate table will be required for bed and for bank sediments.

| | RIVER BANK | RIVER BED |
|-----------|------------|-----------|
| Boulders | % | |
| Cobble | % | |
| Gravel | % 50 | 50 |
| Sand | % | |
| Silt/clay | % 50 | 50 |



CIVE 007

Plant Communities

A meandering river section with a road bridge upstream. The left side has semi-improved pasture, mown common, a small fenced electrical sub-station and further grazed, semi-improved pasture. On the right is a house and garden and grazed pastures.

The left bank is dominated by false oat-grass, cock's-foot, red fescue, nettle, hogweed and great willowherb. Scattered elder and hawthorn bushes occur in mid-section, with white willow trees and saplings downstream. There is a patchy fringe of water-cress and branched bur-reed.

Above the road bridge the right bank forms part of a private garden. Immediately below the bridge three white poplars shade the channel and downstream there is a continuous cover of hawthorn and elder scrub with one ash. The fenced bank edge is dominated by tall false oat-grass, sterile brome, reed canary grass, nettle, cleavers and great willowherb. The fringe consists of an extensive mid-section patch of water-cress.

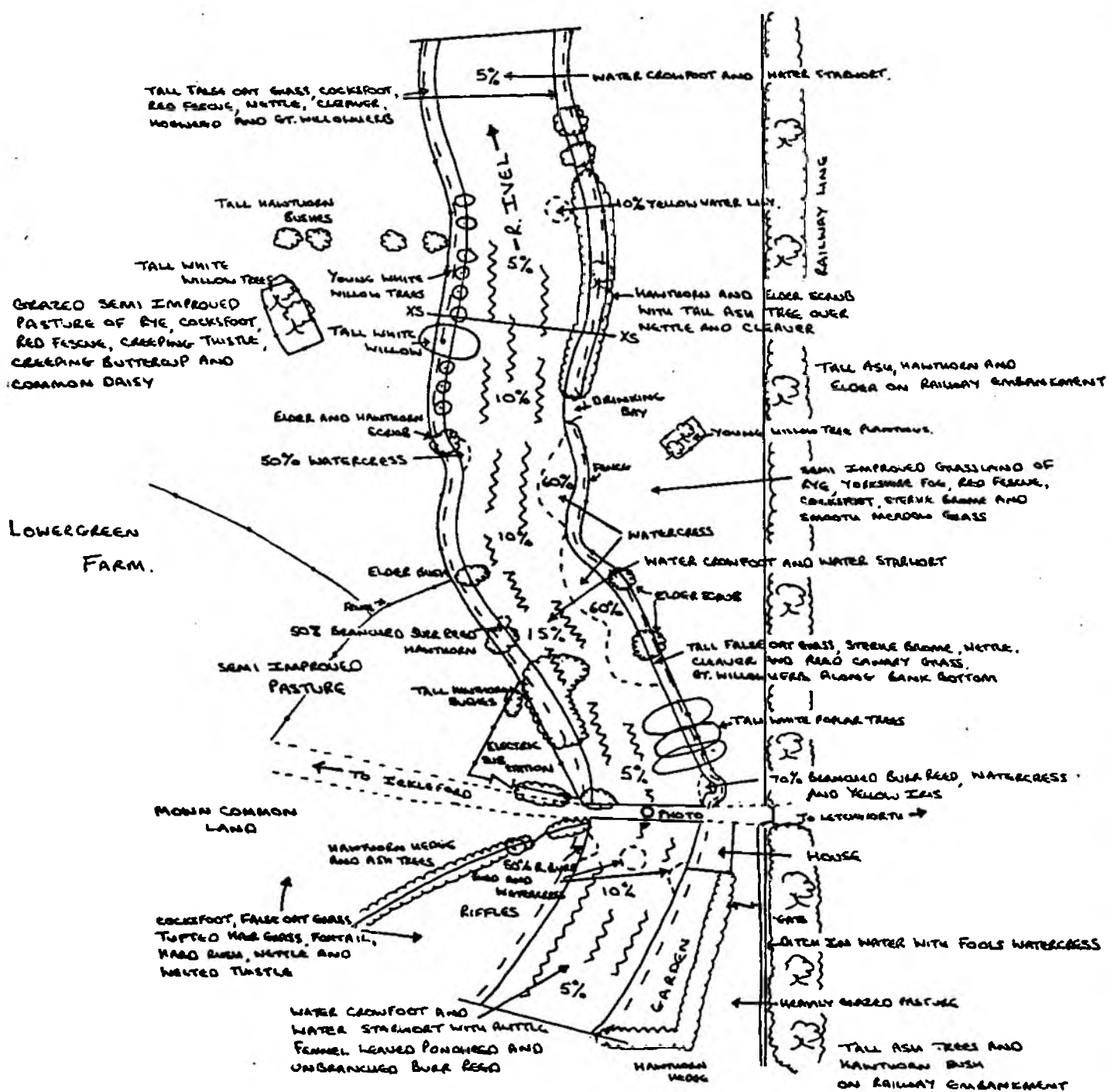
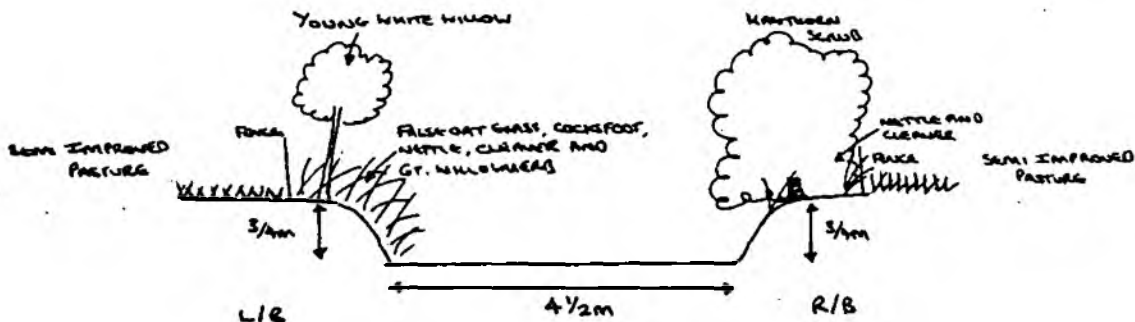
Water crowfoot, water starwort, a little unbranched bur-reed, fennel-leaved pondweed and yellow water lily occur throughout the section and give up to 10% cover.

70 species recorded.

Birds

16 species were recorded. Of these, 11 species (Mallard, Moorhen, Woodpigeon, Wren, Dunnock, Blackbird, Song Thrush, Sedge Warbler, Chaffinch, Linnet - one pair and Reed Bunting) probably held breeding territories which included the river corridor and 5 species (Turtle Dove, Swallow, Blue Tit, House Sparrow and Greenfinch) fed in the corridor but bred elsewhere.

The main habitats for birds include the bushes and trees scattered along both banks, particularly near the Pump House and in mid-section.



RIVER CODE CINE 007
Survey Year 1990.

DATA ON FLUVIAL GEOMORPHOLOGY

GENERAL FORM:

Braided Meandering ✓ Straight (tick one)
Steep (falls) Moderate (riffle/pool sequence) ✓ Low (ponded lengths with no steps) (tick one)

Fixed Heads in Section 0 No. of Riffles in Section — up to 80% of section

Weirs, narrow bridges, rock outcrops and other physical features can act as fixed heads along a river course, maintaining an extensive ponded area, with little evidence of more natural physical processes. This is especially true in low lying fenland areas and navigable lengths, where many rivers are effectively elongated pools with a fixed level (head) at the downstream end controlled by a structure, such as a weir or the foundations of a bridge. These need to be clearly marked on each map.

Photographs: for each 500 m section a photo should be taken to indicate general form, and if relevant also any specific prominent fluvial features.

DIMENSIONS:

Widths: i. Current Wetted channel width — 4-5m
ii. Bankful channel width — 5m
iii. Flood capacity channel width (where there are raised banks on either side), including berms —

Depth: 5cm - 30cm

Flow: FAST

RIVER BED SEDIMENTS AND RIVER BANK SEDIMENTS:

For both bed and bank sediments, an assessment should be made in broad terms and reported as approximate percentages as below. A separate table will be required for bed and for bank sediments.

| | RIVER BANK | RIVER BED |
|-----------|------------|-----------|
| Boulders | % | |
| Cobble | % | |
| Gravel | % 50 | 60 |
| Sand | % | |
| Silt/clay | % 50 | 40 |

CIVE 007



RIVER OUGHTON & OUGHTONHEAD COMMON

General Reference Material

- (i) Oughtonhead Common Management Plan
- (ii) Oughtonhead Nature Reserve Management Plan

OUGHTON HEAD COMMON

Synopsis of management proposals submitted to North Herts. District Council.

Aims of the plan

The study was undertaken at the instigation of the Council, with the support of the Hertfordshire & Middlesex Trust for Nature Conservation.

The aims were to collect all relevant information regarding the Common, to identify the needs and difficulties in proposing future management, and to present outline recommendations from these facts.

The factual study and the problems arising.

Local pressure on the authority to carry out active management of the Common has been mounting for some time. The Common's derelict state, its proneness to damage by vandals, fire, dumping, and its gradual overgrowth by bushes attracted criticism. However, the study draws attention to the fact that the problems are wide. In particular water levels in the river Oughton and also in the Common's peat bed have been drastically reduced, thus reducing the biological importance of the site and adding to scrub growth. Damage caused by this has been exacerbated by fire damage and lack of management of the grassland, ditches, etc.

The biological importance of the Common has been greater than it is now, and it has been regarded as a nationally important site for certain groups of marsh plants, as well as of more local importance for birds and insects. In 1953, the Nature Conservancy recognised this importance by registering the site as a Site of Special Scientific Interest under the National Parks and Access to the Countryside Act, 1949. In 1970, however, this listing was cancelled as a result of the drying out of the peat, and general reduction in biological diversity. However, many local biologists regard the site as still of great value, and of even greater potential. Recognition of the area's interest has recently been made by the declaration of the alder/willow carr on the Oughton's north bank as an educational nature reserve.

Problems of access and vandalism, dumping etc. are closely linked with the use and abuse of rights of way. General access to the Common is not strictly legal, but at present unchecked, causing much damage and adding to the problem of satisfactory management. Public rights of way in and around the Common consist of both footpaths and bridleways. The latter do not cross the Common itself, although horses, as well as motorcycles freely use the Common.

Recommendations

The study only proposes outline recommendations, and details of future action must be agreed upon. It is however essential that early action be taken to carry out some of the proposals.

1. The National Parks Act makes particular mention that there should be a duty on local authorities to maintain a representative flora and fauna particularly in areas designated as open spaces and as nature reserves. While Oughton Head Common is not a nature reserve, its particular biological importance means that the prime aim of management should be to conserve its wildlife.

2. From the main recommendation above, and following the already agreed principle outlined by the former Hitchin Urban District Council, a Management Liaison Committee should be convened at the earliest opportunity, consisting of officers of the Council, the Museums Service and actively interested local bodies. This Committee should draw up a full management plan for the Common after carrying out further necessary studies.
3. From 1 above, the most urgent problem is control of water levels in both the river and the Common's peat. Repairs to the sluices at West Mill to retain water at higher levels is recommended. Also the feasibility of constructing a retaining dyke and sluice at the outfall of the Common's drainage ditches should be looked into. This would be very valuable in maintaining reasonable water levels in the peat, in controlling fire, and in restricting access across the centre of the Common, which is the most valuable area. Connected with this, the possibility of providing a duct from the river to the Common's drainage channels should be explored, particularly for supplying water in times of flood. Finally, to facilitate control of water in the river as a whole, the feasibility of the Water Authority carrying out some kind of river support system like that tried at Ashwell should be considered.
4. Management of the Common's habitats should be looked at overall in relation to the value of particular parts. Studies are needed for this. Some scrub removal is recommended to start with in the formerly marshy areas, as well as mowing occasionally in other parts to retain open grassland. Some of the ditches should be cleared, in relation to proposed water level control.
5. Access control is necessary, but must be seen in terms of the whole surrounding area. In particular fencing and stiling around parts of the Common is necessary to curb dumping, vandalism and use by motorcycles, ~~gypsies~~, etc. Further tightening of access to surrounding farmland should be looked into.
6. Rubbish clearance is a preliminary necessity. Access control would help in the future, as would the provision of suitable litter bins, and more widespread advertisement of the Council's rubbish collection service.
7. Regulations for the Common are seriously out of date and need revision. The appointment of an official warden, possibly for various local Commons, should be urgently looked into. The provision of simple fire-fighting equipment is also recommended.
8. For more general public use, especially for picnics and so on, Burford Ray could be improved considerably by clearance of bushes, drainage of the wetter parts and provision of litter bins, or even picnic places.
9. Dereliction along the stretch of river at Oughton Head is considerable, and it is recommended that an agreement be entered into for the improvement of this stretch with the landowners.
10. Before large-scale management is carried out on scrub and grass/marsh areas it is necessary to carry out detailed biological surveys.
11. The Common has provided schools and others with important field material. To make the best use of this, it is recommended that in the event of a satisfactory management operation being undertaken, the provision of guidance on the Common's natural features should be made. This might take the form of inconspicuous nature trails and an explanatory booklet.

difficult of access.

To the south side of this Common are areas of semi-derelict allotments, and the hedgerow between the two is very thin, allowing easy passage from one to the other.

There is some dumping of rubbish, and a number of dead trees. Surface drains from Westmill Estate empty into the river at intervals, and have caused some pollution at times.

5. Historical notes

Oughton Head Common really has two histories: the origin and decline of its botany and fauna, and the history of local uses of and attitudes to it. Perhaps the high points of both are summed up in statements by the local botanist, Thomas Bates Blow, in 1880:

"I know of no more interesting place for the study of the sedges than Oughton Head. It can be safely said that for its size, it has not its equal in England."

and:

"To see the dusty London Road on a Sunday evening crowded with walkers would make one think there was no such place as Oughton Head, with its river winding under the leafy alders, with seats erected by that true naturalist, the late Samuel Lucas. Here you may walk and not see a dozen people, so little are its beauties known or appreciated."

A fairly good account of the Common's history may be found in two articles by Cyril Moore in "Hertfordshire Countryside", March-April, 1967. Most of his material need not be repeated here, although some details of past use and management are essential to understanding its importance.

It has been said that the marsh habitats of the Common are not entirely natural, owing to the creation of a raised water level in the millstream some time in the late 16th Century. But there is evidence that the present high level millstream is fairly recent, because a map of 1782 shows a different

river system from that at present, with the stream splitting clearly into two at the north-east end of the Common and rejoining below the mill. As many features of the vegetation are evidently far older than this, it would seem that the marsh is a genuinely natural wetland. There is some evidence also that canalization took place in the mid 19th Century, as the town Surveyor, George Beaver, is known to have surveyed the levels there because of complaints that water levels had become insufficient to turn the mill. If this is so, it might well be that from that date the river has become increasingly less likely to flood the Common because of lowering water levels and the raising of its southern bank. The present deep overflow channel from the north-east corner of the Common towards West Mill is evidently the result of excavation to make the millstream from the original bed of the river's southern fork.

This may well explain why the wetlands north of the river have retained more of their original character and flora till very recently, as within the last 30 years winter flooding of the adjacent fields was regular.

Apart from the natural origins of the flora, management has played a vital role in its maintenance, especially since the reduction in regular flooding. The Common's history as a cow grazing is well-known, and this use was the main regulating feature of management. Linked with it was the regular scouring of the open drains across the Common. Obviously this would have had the effect of reducing the area of permanent marsh, although it must be pointed out that the main drain from south to north is a modified natural stream which originally rose as a subsidiary spring, well within living memory.

Paintings by Samuel Lucas indicate the open nature of the Common in the mid 19th Century and later, with a considerable area of wet marsh remaining nearer the river. It was this area which was especially valuable botanically, as well as the private lands to the north. Hedges were low and trees few. In 1843, Samuel Lucas was granted part of the Common as compensation for another piece of land, and this he planted with trees, now forming the beech grove in the south-west. He also planted many trees along the river bank west of the Common, especially alders and horse chestnuts. Many of

the large beeches were there already.

Coupled with the open character of the Common itself, the river also presented a different aspect. Its flow was far greater, especially in spring, and it was appreciably wider, flowing between densely marshy banks. Water levels began to drop at least by the end of the First World War, and certainly by 1930, although the worst effects have been felt since about 1950.

Management of the Common and riverside was therefore constant, if light, in the 19th Century, and the same would be true of the north bank, where there were marshy meadows behind willow groves. The willows were regularly cut for fencing into the 1920's, and there were also pollards for the same purpose. Some planting of 'bat willows' is recorded in the early part of this Century.

Subsequent changes have been gradual, but the expansion of Hitchin in the 1920's brought the estates nearer. There were complaints of trespass and damage, and cars brought trippers to the Common regularly for picnics. About this time also, a number of prominent local naturalists made thorough studies of the Common, and most older records stem from their work. The date from which grazing ceased is uncertain, but seems to have been about 1914. Scrub growth was impeded for a while by both the wet conditions and the presence of rabbits. But after the introduction of myxomatosis in the 1950's scrub growth has been rapid.

In the 1950's, serious outbreaks of fire destroyed much of the grass and marsh vegetation, including the remains of the reed bed. Vandalism, dumping, and camping by gypsies have also played their parts.

Possibly the two most important factors in recent history have been the sinking of the borehole at Oughton Head for water supply, and the dredging of the river bed in the mid 1950's to increase drainage for the farmland. The real effects of the first are uncertain but the material from the dredging has created a more effective barrier against flooding on the Common, hence aggravating its tendency to dry out.

6. Biological importance

6.1 The Common area is an alkaline marsh founded upon peat deposits, shading off into grassland on a thin layering of glacial drift over chalk.

The peat formation is the especially valuable habitat, and was formed by deposition in a wet hollow retained by glacial deposits of boulder clay and gravel.

6.2 Oughton Head springs are alkaline springs arising from the Melbourn Rock stratum of the Middle Chalk. The Oughton is therefore a strongly alkaline stream flowing through peat which tends towards acidity. This would naturally produce fen carr.

6.3 The unusual geology has resulted in a very diverse flora which has been the Common's most valuable aspect. Plants of particular importance in the past have included various orchids, (~~water-violet~~) grass of Parnassus, brookweed, bogbean and a wide range of sedges, many of which indicate the antiquity of its flora.

6.4 Owing to the reduced water level in the marsh, the spread of scrub plants and the lack of maintenance of ditches, damage by fire, etc., much of this valuable flora has apparently been lost. This process has been a slow one, and Dr J. Dony, author of the "Flora of Hertfordshire", has remarked that probably no living person has seen the Common at its best, botanically speaking.

6.5. The Common has also been highly regarded for its bird life. Reference to "A History of the Birds of Hertfordshire" by B. L. Sage will show the various rare species recorded there in the past. Marsh and water birds, such as bittern, bearded tit, spotted crake, little crake, kingfisher, oystercatcher and so on are among the most notable, but large and regular breeding populations of commoner species are also important. With the decline in the marsh habitats, many species have disappeared, such as the reed warbler; and destruction of nests, shooting, etc. has taken its toll. At present the breeding populations of various species are fairly high, owing mainly to the good supply of food with insects and seeds.

- 6.6 The Common's insect life does not appear to have been studied recently, but it was a noted site for butterflies and beetles in the 1930's.
- 6.7 With the existence of a chalk stream and marsh, the site was also noted for freshwater life, especially fish. Again, with the reduction of water levels much of this has no doubt been lost, although little recent study of these groups seems to have been carried out. The river and ditches are still an important breeding area for toads and frogs.
- 6.8 The Common, with the springs, river and north bank woods were listed by the Nature Conservancy in 1953 as a Site of Special Scientific Interest. This listing was cancelled in 1970, owing to the reduction in biological importance caused by the drying of the peat marsh, and the lack of flow from the springs.
- 6.9 Despite this lessening in importance, the Common and the river remain an important area for a wide range of living organisms. As the surrounding farmland becomes more and more intensively cultivated this importance will increase, even if there is no improvement in the Common's habitats. On the other hand the spread of scrub and the continued drying out of the soil will gradually reduce the diversity of life it can support.

7. Status and Rights

7.1 Previous status.

Oughton Head Common and Burford Ray were, along with Walsworth Common and Butts Close formerly used as cattle grazing for the people of Hitchin. The sole common right was that of grazing held by those houses which were in existence or were on the site of one in existence by the 13th year of the reign of Elizabeth 1st. (1572).

7.2 Present status.

Under the Commons Act, 1899, and the Law of Property Act, 1925, provision is made for general public access to commons within urban districts, of which Oughton Head Common is one.

8. Management

8.1 Oughton Head Common

Some mention has already been made of the main management techniques. Periodic grazing of the major part of the Common kept herb levels low. This applied also to the banks of the river near West Mill, now bush covered. There is no evidence that the Common was ever mown regularly, or that the marsh vegetation was cut, although this is possible.

There were two main drainage ditches, with various smaller drains, shown well on the Ordnance Survey 6" map, 1880/1. The Hitchin Board of Health Map, 1852, shows a different pattern of drains, but still includes the main drain from the south end. All these ditches were cleared regularly, and were the site for the water violet which T.B. Blow noted as growing profusely in newly-cleared ditches about 1880.

Hedges. Early paintings by Samuel Lucas indicate that the Common only had very low hedges. About 1900 the pathway from Oughton Head to the Common crossed a stile. At least the west side of the Common was hedged at an early date, but there is evidence that the east side was open up to about 1800. The ownership and maintenance of these hedges is not clear.

An attempt at ploughing the Common in the Second World War was given up.

Present management

For some time, management has been passive. Grazing stopped about 1914, and the ditches have not been cleared for many years. Footpaths over the Common have occasionally been cleared, and barriers against cars put up along Oughton Head Lane, West Mill Lane, and Burford Ray entrances. Rubbish is cleared occasionally. Some tree planting (ash, oak, and beech) has been carried out in 1974, mainly around the eastern perimeter, with two groves along the western edge (one of which has almost been destroyed by vandals since).

8.2 Burford Ray

Past management of this strip of land is unclear, it probably being used as access to Bedford Road from the Common, as well as a flood plain. Early photographs show it as short turf.

Recent management has been minimal. The overflow ditch to the south is nearly obliterated. Much of the area is overgrown with thorn. There has been some disturbance of the ground for the laying of land drains from Westmill Estate, as well as a recent pipeline near the junction with Bedford Road. Some ornamental willows were planted by the river at Bedford Road.

8.3 River Oughton

General management of the river by the Common has been carried out by Hitchin Urban District Council with financial assistance from Hertfordshire County Council. In 1915/16 the County Council smallholdings committee were responsible for at least part of this clearance, when weeds were cleared from the watercourse.

Recently the whole length of the river beside the Common has been regularly cleared of encroaching weed. Some herbicide has been used. Fallen trees have been removed from the river.

Most importantly, silt has sometimes been cleared, especially in the mid 1950's when the Great Ouse River Authority carried out large-scale dredging, to lower the bed of the river. This silt has been heaped up on the south bank, adding to the existing bridleway bank. This has helped to prevent flooding of the Common, while increasing the river's drainage capacity for the neighbouring farmland.

Water levels in the millstream are controlled by two sluices: one on the site of the old West Mill, the other an overflow above the mill. Both consist of boards inserted in grooved pillars, and replace permanent sluices built in the 19th Century. There is considerable leakage from both sluices at low levels.

Above the Common, river maintenance has been minimal for some time. The springs are completely silted, as is the watercourse until it nears the Common. Several fallen trees and much rotten wood lie in the stream.

Recently a management committee for the north bank woods has been clearing some of the springs along that side of the river.

Rubbish accumulation in the river is patchy. It is occasionally cleared from the Common area, but not from Oughton Head. The Hertfordshire and Middlesex Conservation Corps have carried out some clearing toward the Head recently.

8.4 Surrounding Land

Most surrounding land is cultivated arable. One field east of the Common is kept as rough grass for recreation. Another field south of Burford Ray is semi-derelict allotments. North of Burford Ray, two parcels of land are unused grassland, and there is a new plantation of poplars.

The Hertfordshire County Council woods north of the Common are passively managed as a nature reserve by the Education Department. Formerly, they were willow and osier coppice, with some pollarded willows, used for fencing. A small area at the east end of the Common by West Mill is used as pens for greyhounds.

The trees south of Oughton Head were mainly planted in the 19th Century. No management is now carried out.

Hedgerows to the west of the Common are large, mostly unmanaged, with many gaps. Farmland to the north of the Common has few remaining hedges, most of which are kept low.

A corner of one field beside the bridleway to the Pirton Road is fenced off and mown, housing the Lee Valley Water Company's borehole equipment.

9. Public Use

9.1 The number of footpaths and attractions in and around Oughton Head Common mean that the Common itself is only one part of the area's overall attraction. The map showing public access shows the general pattern.

Part 2. Problems

10.1 Introductory

The facts outlined in part 1 illustrate the history, importance, public use and status of the Common in relation to its surrounding landscape. It has been impossible to state these facts without reference to the all-too-evident difficulties they portray.

It is clear the problems are both social and technical, and that both are influenced considerably by if not dependent upon the particular historical context.

In any set of proposals, the various conflicting interests must be weighed against each other, against the known technical problems, and their likelihood of solution, and against the need or otherwise to maintain or improve the natural features of the site.

10.2 Management principles

Clearly, the first problem is to define an attitude toward Oughton Head Common, in order to know what the aims of management are going to be.

Part of the problem here is that the Common cannot be isolated in terms of attractions or importance, although surrounding lands are not under Council control. This problem applies particularly to footpaths and access, the management of Oughton Head itself, and the technical complexities of water supply from the bore-hole.

Leaving these matters aside for the moment, we must note that, from the public and official points of view, some desire has been shown to protect the natural features of the Common, and its wild-life. Many private individuals have said they want the Common 'kept wild'. The Hertfordshire & Middlesex Trust for Nature Conservation has also been keen to protect and foster the wild-life of the Common. Hitchin Urban District Council agreed that this should be the main management principle. (See the report of the Engineer and Surveyor, 8th June, 1973, reference JB/VR).

The scientific importance of the site has been noted. Current management

and some public uses have reduced this importance. It must therefore be decided whether to embark on a full-scale programme of improvement from the point of view of wildlife, or whether to modify this with reference to public uses. In making this decision, note must be taken of the effects of vandalism and/or over-use by the public on both the works being carried out and on the wild-life during and after the first years of management. Thought must also be given to the fact that it is not good enough to merely let things go if the wild-life is to prosper. The processes of deterioration in habitat, especially in marsh habitats are very rapid, and in order to maintain the habitat at any one particular level, active management is essential.

10.3 Water levels

Assuming that a conservationist attitude dictates management techniques, the crucial problem for maintenance and improvement of the Common as a natural habitat is lack of water.

Extraction of water from the bore-hole at Oughton Head is not proved to have caused the reduction in flow from the springs. Serious reductions in flow occurred in 1921 and 1934. The bore-hole was opened in 1944. But the relationships between water-extraction from the chalk aquifer as a whole (including Offley Temple End and Charlton wells) and reduction in flow of the Oughton (as well as the Hiz and Purwell) need to be examined. Rainfall has been low for five years.

Connected with this, questions of whether or not to increase water levels in the peat; and whether to try and increase river flow, must all be weighed against the technical problems, the cost, and the effect of such action on public activities. More water in the marsh would stop most people from crossing the middle of the Common.

10.4 Vegetation management

As a botanical site, the Common is suffering not only from continued desiccation, but also from encroaching scrub. To some extent the two are related, especially in the formation of dry willow carr, and in the encroachment of thorn on former marshland.

If some of the marsh flora and grassland areas are to be conserved, some early action is essential. But the problem exists how this is to be balanced against habitat requirements for other wild-life species, notably birds and mammals. For example, many bush-nesting birds might suffer if excess scrub-clearance were carried out in the wrong places. It might also be necessary to consider the expansion of vandalism if more of the Common were accessible.

Further points to consider should be the extent to which it is desirable to open up certain areas as attractions to the general public. Present picnic sites are few and untidy. One particular difficulty is that people would prefer riverside sites, which are also important for wild-life. There is however, the possibility of improving the attractions of Burford Ray for this purpose.

Control of river vegetation should also be considered with regard, not only to the drainage of farmland, but also to the importance of the botany. The use of chemical herbicides in particular should be examined.

10.5 Access

The linked problems of access and vandalism are very important. There is clearly a need to determine such questions as the use of footpaths, the unrestricted movement of people through neighbouring farmland, and the use of the Common for activities like horse-riding, motorcycling, gypsy camping, and so on. As this is a wider question than management merely of the Common, it must be seen in terms of the whole surrounding district.

Access should also be considered with regard to the previous points above, and to the likelihood of any particular course of action creating more or less pressure on the Common.

10.6 Vandalism

This problem, like 10.5 above, is not restricted to the Common. It is partly a function of nearness to the town, partly of the neglected state of both the Common and its immediate surrounds.

Deliberate vandalism includes the shooting of wild-life, rifling of nests, the picking and removal of plants, widespread theft of peat, cutting and stealing of trees, and the firing of the undergrowth. Tresspass on farmland and especially on the County Council reserve north of the river, and the dumping of rubbish can be included in the problem.

Outside the Common, certain places are particularly vulnerable. Oughton Head suffers from use as a motorcycle scramble, as well as a convenient dump, while Ducklands Cottages attract anyone interested in destruction. Once again, both are attractive because of inadequate maintenance and supervision, and their continued presence will be a threat to any management of the Common itself.

Part 3. Outline Recommendations

11.1 Introductory

In making these recommendations, thought has been given to the relative merits of the Common and its surrounds from both an amenity and scientific point of view, but no detailed attempt has been made to assess prospective use of the Common in the event of any particular course of action being followed. It is also recognised that before any firm action can be undertaken, especially regarding habitat management, more factual surveys are essential, and more consultation with relevant bodies is needed. Some of this information is already available, but its use depends upon the particular line of approach eventually decided upon.

11.2 Recommended aims and terms of management

Considering that the Common itself is primarily important as a regional reservoir of wildlife, and that most active public interest in the Common either depends upon this (with private naturalists or school parties), or is fairly non-intensive (walking, picnics, and so on), the primary aim of management should be the protection, fostering and improvement of the Common's wildlife potential.

This is especially important in relationship to the existing use of the river's north bank as an educational nature reserve.

With the existing rights of way and with public access to the Common assured in law, there seems no reason why such access cannot be controlled with this prime aim in view. This might mean that the general public should be passively discouraged from entering certain parts of the Common, especially at certain times of the year (e.g. the breeding season for birds). Any scheme to open up the Common for more active public use, or to actively encourage more public use, would be detrimental to the recommended primary aim of management.

Burford Ray, on the other hand, is of less biological importance, and is capable of considerable improvement as an attraction for the general public.

11.3 Public liaison

It is recommended that if this study is accepted, even in outline, a Management Liaison Committee be set up consisting of members of the Council's Technical Officer's Department, the Hertfordshire & Middlesex Trust for Nature Conservation, the Museums Service Natural History Department, and representatives of private interests actively involved with the Common. From this Committee, studies should be undertaken and specific plans be drawn up for action by the Council. It is essential that the first steps in active conservation be taken as soon as possible.

It should be noted that the formation of this Committee has already been agreed to by the Engineer and Surveyor, in his report to the Council of 8th June, 1973, reference JB/VR. and agreed in principle by the Council General Purposes and Museums Committee on 14th June (Minute 35, 1973/4).

11.4 Water level control

It is recommended that attempts be made to increase water levels in the Common's peat areas. Two main courses of action should be examined: firstly, the possibility of ducting some water from the river round the artificial raised bank into the marsh drainage channels; secondly, the practicability of creating controlled water levels in the peat by constructing an outfall sluice at the Common's north-east point, below the junction of the two drainage ditches. Connected with this, it is recommended that certain stretches of these ditches be cleared and repaired, but only with reference to botanical habitats, and not so as to allow free drainage from the Common's peat bed. These channels would then act as a deterrent to excess trampling as well as a reservoir for pond life and aquatic vegetation.

Secondly, it is recommended to examine the practicability of establishing a minimum flow in the river. The question of river support systems is being looked into by the East Anglian Water Authority, especially for providing a minimum flow downstream in the Great Ouse. In the process, experiments have been conducted to see if artificial supply of ground water to Ashwell Springs is feasible, in order to protect the springs' biological importance.

This is necessary because pumping of water from the chalk to supply river systems in the summer months would mean a drying up of river-head springs. Various rivers in the Hitchin district might be even more severely affected if such a scheme were used for the Cam, and it is suggested that the Council take this matter up with the Water Authority to see if a scheme like that operated at Ashwell is possible for the Oughton. It is recognised that some more public support might be more forthcoming for a scheme involving the Hiz, due to its presence in Hitchin town centre, but if such a scheme is possible, the great amenity and biological importance of the Oughton should not be forgotten.

In relation to the question of water levels in the Oughton, it is possible to carry out some measures for immediate improvement. It is recommended that the sluices above West Mill be repaired and improved, so as to retain water at a higher level along this stretch of the river. This might restrict the flow, and initially cause some silting, but not appreciably more than there is already.

11.5 Oughton Head Common: habitat management

i) scrub control.

It is essential to control scrub, particularly thorn, if the open grassland is to be maintained and its botanical variety improved. There are, however, qualifications to this. The continued development of some areas would produce mature woodland, and might provide a new diversity of habitat for a variety of wildlife species. These areas should be determined by comprehensive field surveys.

The development of willow carr on former peat marsh is less damaging to the overall botany, as long as it is restricted. This carr provides good habitat for animal life dependent on wetlands.

An overall study of scrub development and its differential value to wildlife must be undertaken as soon as possible. In the mean time the growth of young thorn in previously marshy areas should be stopped by scrub clearance. In the event of a partial return to marshy conditions some of this growth would be retarded.

ii) mowing.

To retain a diverse flora in grassland, periodic mowing is essential. This controls the spread of woody plants and rank grasses. In marshy areas, this management should be very carefully supervised and infrequent. When a study of scrub has been carried out, it will be possible to operate a system of mowing, the times of which should be researched in advance. A further complication is the existence on the Common of large colonies of ants. Their hills are an important habitat feature, not only for plants but also for insects and birds. Any mowing technique must not damage this feature unduly.


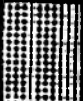



While the scrub study is being undertaken, it is recommended that areas of particular botanical importance be researched and control of young scrub and rank vegetation be exercised. There may be a possibility of employing the Hertfordshire and Middlesex Conservation Corps to help with this work.

iii) Ditches.

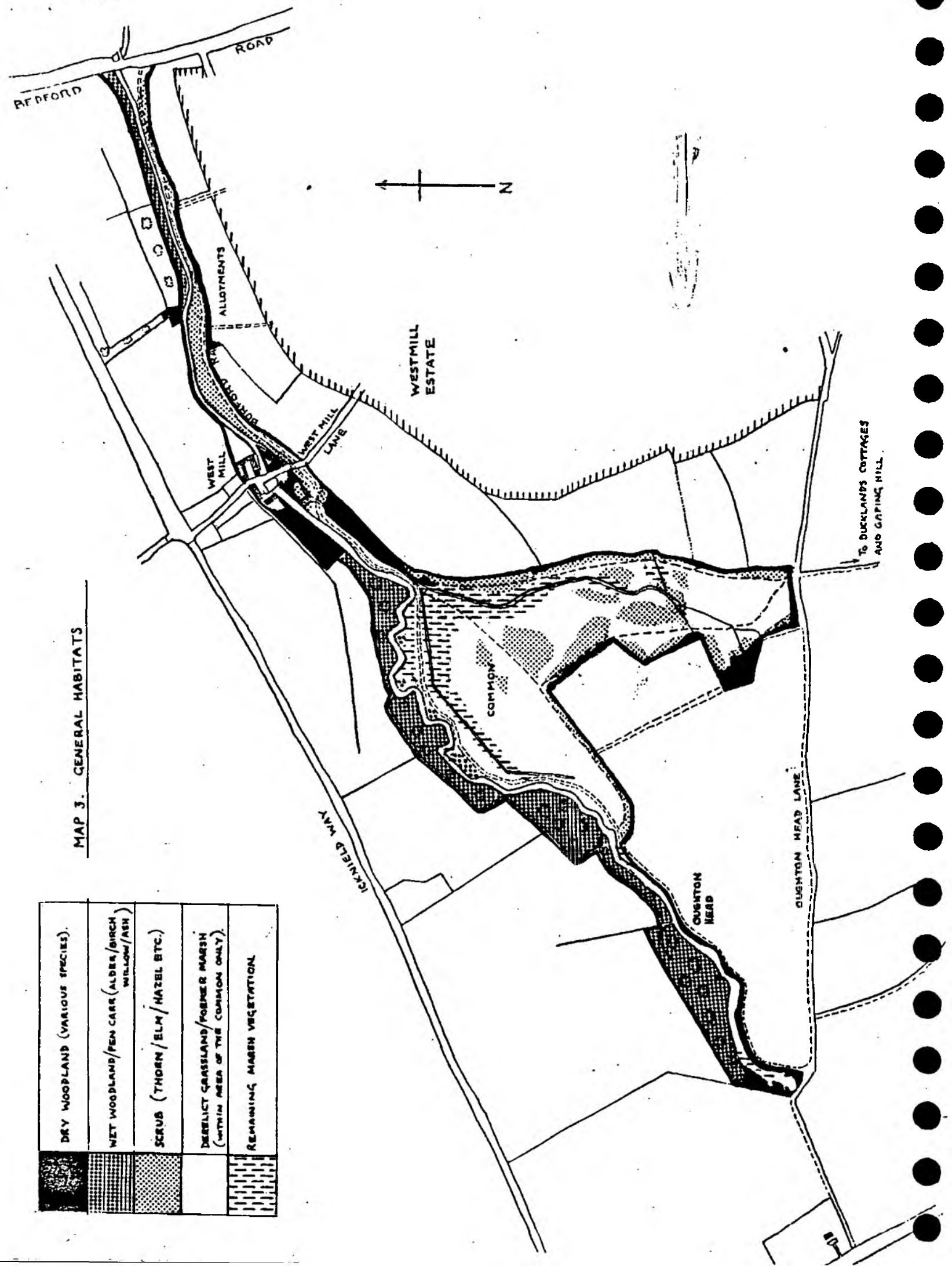
If water levels in the Common can be controlled by way of a sluice, it would then be possible to clear the main drainage channels, as mentioned in 11.4 above. These ditches act as an important source of water for the remaining wetland flora, as well as freshwater life of various sorts. Willow carr developing along their banks is often important for birds, and any clearance should take this into consideration. Dredged material should not be allowed to form banks.







iv) paths.

Raising of water levels and the clearance of drainage ditches will not affect present major paths, except for the recent path across the middle of the Common. It is recommended that some improvements be made to the path along the east side of the Common where it is wet, and that a bridge from this path to the riverside path be erected in conjunction with the recommended sluice. At this point it should be possible to restrict public use of the path across the Common, thus keeping the centre of the Common more free from human disturbance.

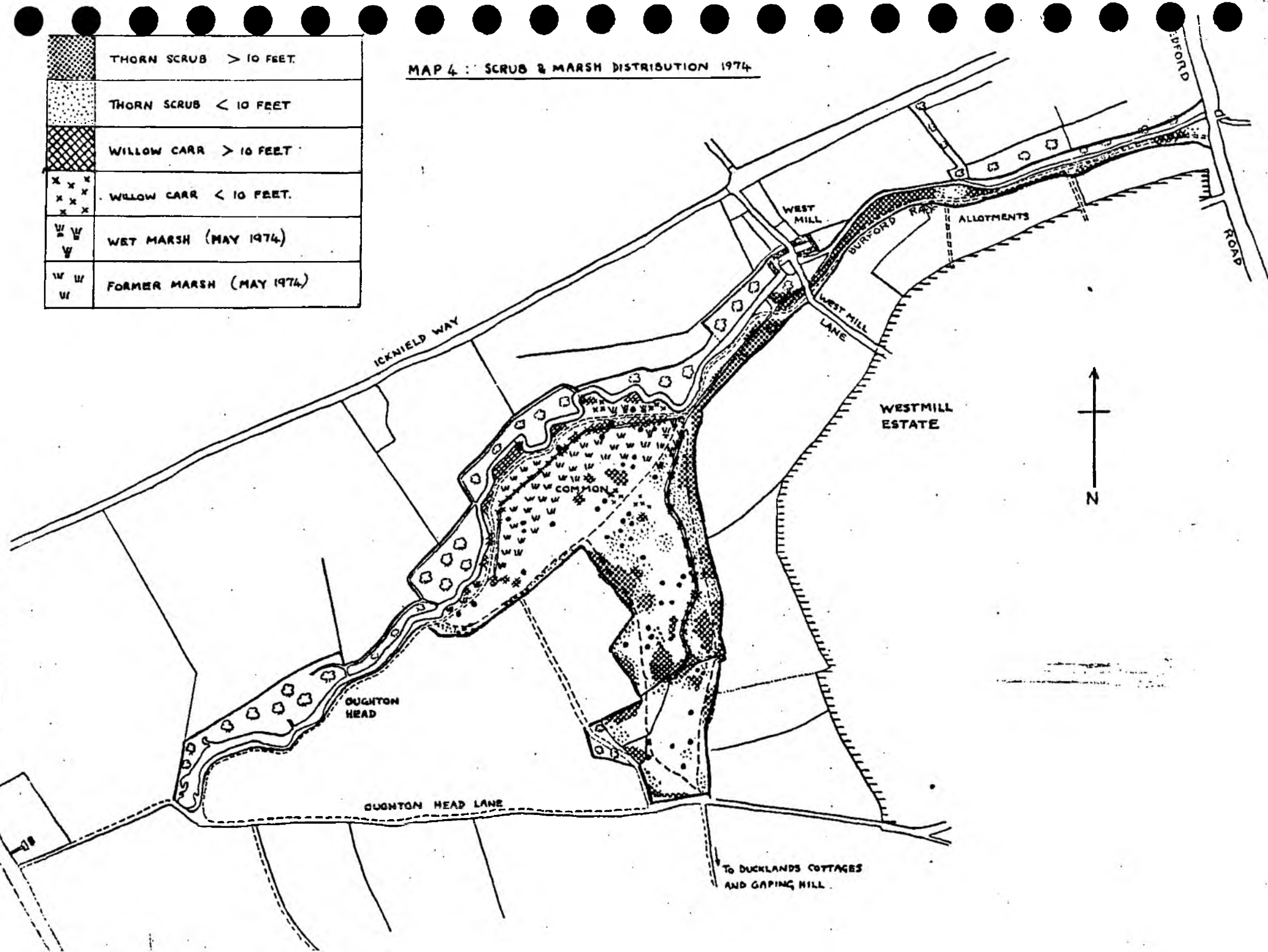
| | |
|---|---|
|  | DRY WOODLAND (VARIOUS SPECIES). |
|  | WET WOODLAND/FEN CARR (ALDER/BIRCH WILLOW/ASH) |
|  | SCRUB (THORN/ELM/HAZEL ETC.) |
|  | DERELICT GRASSLAND/FORMER MARSH (WITHIN AREA OF THE COMMON ONLY) |
|  | REMAINING MARSH VEGETATION |

MAP 3. GENERAL HABITATS



| | |
|---|-------------------------|
|  | THORN SCRUB > 10 FEET. |
|  | THORN SCRUB < 10 FEET |
|  | WILLOW CARR > 10 FEET |
|  | WILLOW CARR < 10 FEET. |
|  | WET MARSH (MAY 1974) |
|  | FORMER MARSH (MAY 1974) |

MAP 4 : SCRUB & MARSH DISTRIBUTION 1974



NORTH HERTFORDSHIRE DISTRICT COUNCILRECREATION AND AMENITIES COMMITTEE, 19th December, 1974.REPORT OF THE DIRECTOR OF MUSEUM SERVICES.Oughton Head Common: Management proposals.1) The need for management: origin of the scheme.

The scheme originates from a decision of the General Purposes and Museums Committee of Hitchin Urban District Council dated 14th June, 1973(Minute 35 1973/4) in which the outline recommendation of the Engineer and Surveyor that a scheme of management be drawn up was accepted. It was agreed that a detailed management plan was necessary because of the continuing public pressure over the state of the Common, and especially from the Hertfordshire & Middlesex Trust for Nature Conservation, who had drawn attention to the biological importance of the site. This scheme has therefore been prepared by the Natural History Department of the Museums Service, in consultation with the Trust and other interested parties.

2) The problems involved.

Oughton Head Common is not only an area of public amenity but also a site of biological importance. It consists of a chalk river running through a deep peat bed, which supports an important marshland flora and fauna. Its value was recognised in 1953 when the Nature Conservancy listed it as a Site of Special Scientific Interest under the National Parks Act, 1949. Lack of management, however, and especially a reduction in the height of water levels in both the marsh and the river have resulted in a lessening of its biological richness, and resulted in 1970 in its removal from the Conservancy's list. Other problems have been worsened by this overall decline, notably overgrowth by scrub, dumping of rubbish, vandalism, theft of peat, and its unofficial use as a motorcycle race-track.

The most important factors in proposing a management scheme for the Common are therefore:

- i) an improvement in the biological habitat to conserve the remaining flora and fauna.
- ii) effective control of the environment to improve general amenity for the public.

2(cont.)

In considering this scheme, other factors have been considered, notably the widespread damage through vandalism and trespass in neighbouring farmland, the existence of a County Council Educational Nature Reserve on the north bank of the River Oughton, and the effect of inadequately defined public rights of way upon all these aspects. In particular, it should be noted that the Common only has public footpaths across it, not bridleways.

3) Recommended action.

3. 1 Public use of the Common is considerable, but mainly passive, consisting of walking, picnics, and educational use from schools, etc. All these activities depend on the naturalness and rich environment of the Common. Any action should therefore attempt to improve the natural environment both for biological reasons, and for public amenity.

3. 2 A management liaison committee should be established representing all actively interested parties. This was agreed in principle by Hitchin Urban District Council.

3.3 To improve the natural environment, control of water levels is essential. For this, 3 recommendations are made:

- i) the raising of river levels in the millstream by improving the existing sluices.
- ii) the conservation of water levels in the marsh by constructing a dyke and adjustable sluice across the Common's outfall stream; and the repairing of existing ditches. This would involve the obstruction of only one path over the Common: a recent one across the middle.
- iii) the addition of a flood-water overflow from the river to the marsh to avoid flooding of farmland and add water to the drying marsh. This requires permission from the Water Authority.
- iv) a further recommendation is made that future thought be given to a river support scheme in the event of river levels remaining permanently low.

3.4 Further improvement of the environment should consist of selective control of developing scrub especially in marsh areas, and the infrequent cutting of open grassland for its maintenance.

- 3.5 For effective control of dumping, peat theft and vandalism etc., it is necessary to define existing rights of way clearly throughout the area. It is therefore recommended that the bridleways near the Common be gated and their entrances fenced round to prevent access by motorcycles, etc. It is further recommended that only pedestrian access be allowed to the Common itself by fencing and gating/stiling against the bridleways, especially by Oughton Head Lane, at West Mill, and near Oughton Head. Further problems of unrestricted access arise from the Council's playing field between the Common and the Westmill Estate. This is unfenced. All fencing should be unobtrusive and rural in character.
- 3.6 Byelaws for the Common are seriously out of date, and should be revised. It is recommended that an official warden be appointed, perhaps for several of the Commons in north Herts. Financial help for this purpose might be available from the Countryside Commission.
- 3.7 As the Common itself would not allow much further development of public amenities like picnic sites without damage to the environment, it is suggested that Burford Ray be improved by scrub-clearance and path maintenance, etc., for this purpose.
- 3.8 Oughton Head Common, improved by the above recommendations, would present an attractive and valuable local asset. In particular its educational value would be strengthened, and it is recommended that future thought be given to the provision of educational guides, inconspicuous nature trails and so on.

4) Costs and Works involved.

The Technical Officer's Department has advised on the necessary works, especially in 3.3, 3.5, and 3.7 above. A summary costing has been made:

| | |
|-----------------------------------|----------------|
| i) Water level control | £ 3,000 |
| ii) Fencing and stiling of access | £17,000 |
| iii) Miscellaneous works | £ 3,400 |
| | <u>£23,400</u> |
| iv) Recurring expenditure | £ 600 p.a. |

Against this it should be noted that a provisional application for grant aid has been made to the Nature Conservancy Council for the water level works, and that there is also the possibility of a grant from the Countryside Commission towards other works for the improvement of public amenity. This might apply especially to the cost of fencing.

5) Time Scale

It is essential that some action be taken immediately for the preservation of the remaining marshland. Items in 3.3 are of first importance in this. Other works could be carried out over two or three years.

- 6) Is it the Committee's wish that this Management Plan be adopted in principle, to be implemented as soon as possible?

If '6' is agreed, there are three alternative courses of action.

- a) That provision be made in estimates for 1975/76 for the whole scheme.
Total cost £23,400
- b) That provision be made for part of the scheme, with the intention of completion in later years. If so, it is recommended that the work connected with water-level control should receive priority, bearing in mind that the Nature Conservancy Council may provide substantial grant aid towards the estimated £3,000 cost of this sector.

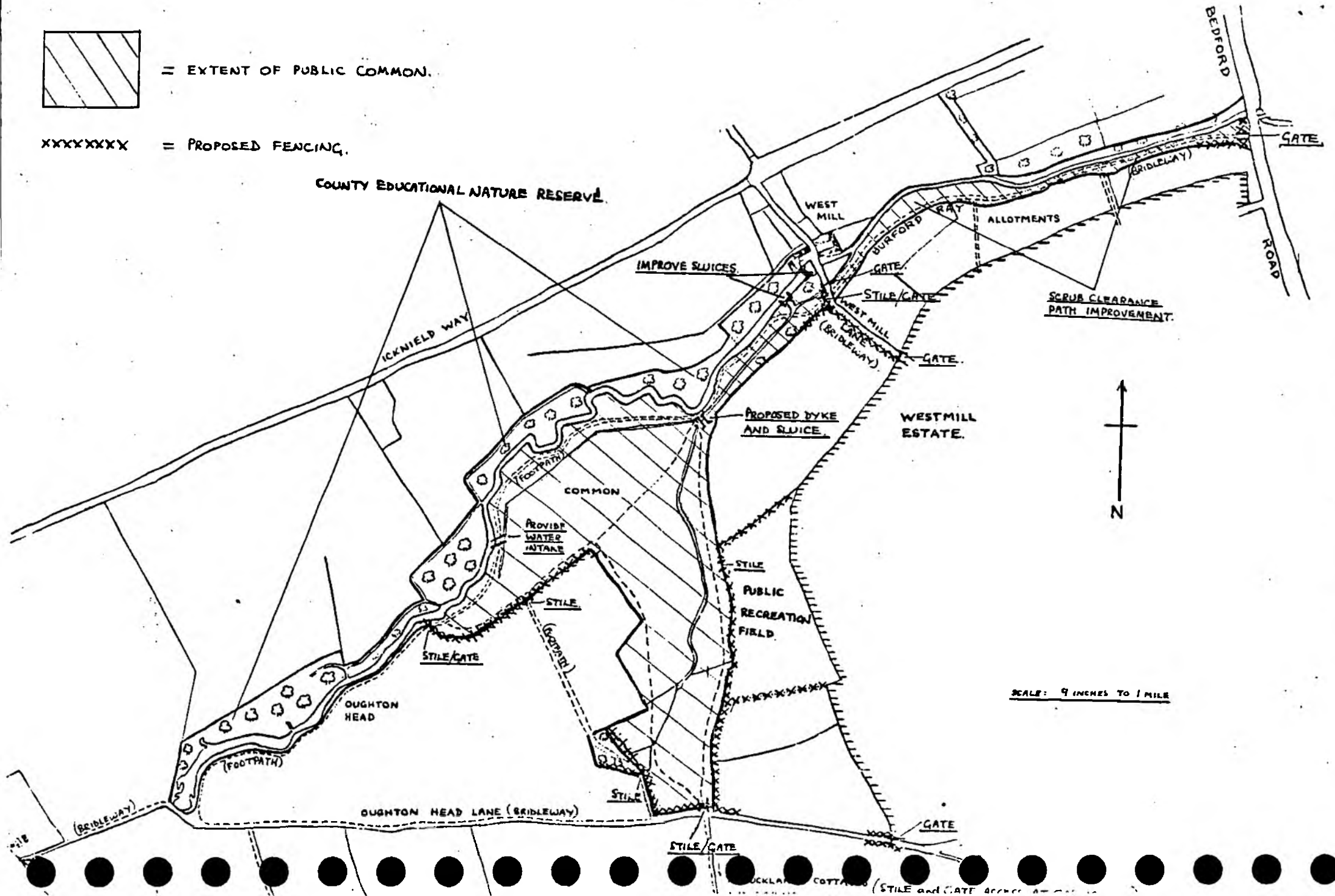
- 7) That in any case, an Oughton Head Management Advisory Committee be set up immediately, with representatives from the appropriate Council Departments and actively interested outside bodies.

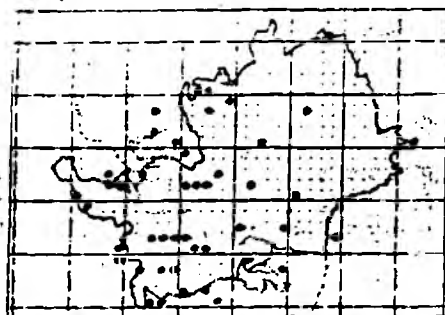
DOUGHTON HEAD COMMON: OUTLINE PROPOSALS.



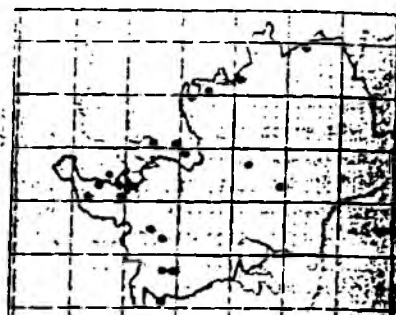
= EXTENT OF PUBLIC COMMON.

XXXXXXXX = PROPOSED FENCING.

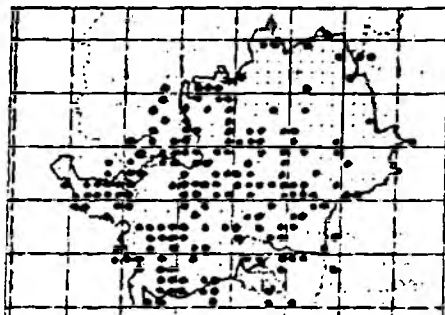




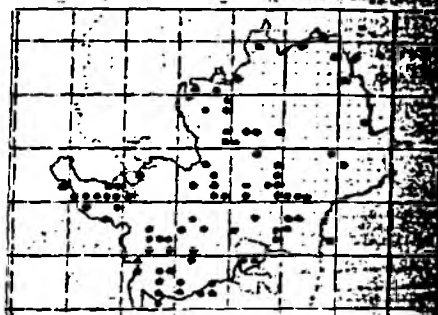
Didymium squamulosum



Abscisa crassipes



A All recorded squares



B Squares recorded by B. Ing

Acknowledgements

Thanks are due to Don Graham and Peter Holland who have made their field records available to me and to the Curator of the St Albans Museum for the loan of critical specimens from the Saunders collection. I am grateful to the Keeper and staff of the Botany Department, British Museum (Natural History) for allowing me regular access to the Herbarium and to the Lister Notebooks.

References

- Bentley, P. (1960). 'A paradise for moisture-loving plants', *Hertfordshire Countryside* 25 (138), pp.36-8.
- Ing, B. (1968). *A Census Catalogue of British Myxomycetes*, British Mycological Society.
- Ing, B. and Coker, P. D. (1967). 'Hertfordshire myxomycetes', *Transactions HNHS* 26 (4), pp.200-8.
- Keller, H. W., Aldrich, H. C., Brooks, T. E. and Schoknecht, J. D. (1975). 'The taxonomic status of *Badhamia orispora*: a myxomycete with unique spores', *Mycologia* 67, pp.1001-1004.
- Martin, G. W. and Alexopoulos, C. J. (1969). *The Myxomycetes*, Iowa University Press.
- Mitchell, D. W. (1977). 'The bark myxomycetes - their collection and identification', *School Science Review* 58, pp.444-55.
- Nannenga-Bremekamp, N. E. (1974). *De Nederlandse Myxomyceten*, Knutphen.

The Flora of Oughton Head, Hitchin

Trevor J. James

In his survey of the Hertfordshire flora, Dr Dony (1967) notes that Oughton Head Common is the largest marsh associated with the chalk and that it is 'rapidly drying out'. This statement summarises both the importance of the site and the particular problems of management which it poses.

Hertfordshire has few base-rich marshes, but their flora is often very diverse. Oughton Head Common and its complex of associated woodland, fen, scrub and river are still good examples of this type of habitat. The area is associated with the source of the River Oughton, north-west of Hitchin, which is a chalk river, rising at 200 ft. OD from the Melbourn Rock. Below its source, the river occupies a shallow basin before joining the River Hiz at Ickleford and becoming part of the headwaters of the Ivel. It is this shallow basin, partly dammed by a deposit of glacial gravels, which has become Oughton Head Common.

The area under study consists of the Common itself, about 16 hectares, various stands of woodland and fen carr along the north bank of the river, forming Oughton Head Nature Reserve, about 6.4 hectares, and two stands of trees on private farmland. The primary division between the Common and the fen of the Nature Reserve is fundamental, reflecting a strong contrast in soil structures, as well as flora. These in turn have much to do with the land use of each.

Land management history

Some study has been made of available records to ascertain past land uses which have affected the flora. It is evident that part of the area was grazed from an early date. The date of the establishment of Oughton Head as a town common for Hitchin is unknown, but its present shape dates back at least 200 years. Grazing of town cattle continued from pre-Reformation days to the beginning of this century and probably ceased about 1914.

North of the river, fen carr has developed over what was used until about 1920 as an osier bed and willow pollards for fencing etc. There is however no evidence that it was used at all recently for any other purpose apart from shooting, although one part was a sedge fen in the 19th century and may have been used as part of the adjoining meadow at an early date.

A late 16th century water mill at West Mill, probably on the site of an earlier one, is situated where the glacial gravels have been worn through by the river.

This must have had a strong influence on the survival, if not the creation of marshy conditions on the Common and in the fen carr. A raised millstream would have impeded drainage on the Common, and it is known to have been raised in the 19th century owing to decreasing river flows. In 1961, however, it was lowered again when the mill was burnt down.

Soil sampling from various parts of the area has supported what is known of its history. Soils on the Common away from the river are generally a light peaty loam over weathered chalk or loamy marl, ranging in pH from 7.02 to 7.16 in upper horizons. Nearer the river, the peat content rises in sub-surface soils, especially in an area demarcated from the former grazing land by a 19th-century ditch and between it and the river. Here the organic carbon content is over eight times as great as in the grazing area although the presence of alkaline water retains a fairly high pH of 6.30 even in almost pure peat. Soils in the fen area show less loam, indicating no recent grazing, and a good depth of peat, probably from sedges and similar vegetation.

Recent changes in water regime as well as land use have seriously affected the flora of the Common, and to a lesser extent that of the Nature Reserve. The extraction of water from the chalk for public consumption has increased over the last fifty years, culminating in the sinking of a bore within 300 yards of the springs at Oughton Head in 1944. While this may not have directly affected the springs, overall water levels have seriously declined, resulting in the steady desiccation of the surface soil. This has been exacerbated by the lowering of the millstream and the dredging of the river in 1959, so that the marsh areas of the Common have been reduced and are usually dry in summer.

Another important influence on the Common's flora has been public pressure and neglect. Now that low-grade grazing is uneconomic the relatively stable meadow and marshland flora which was maintained by continued grazing has been superseded by rank vegetation and scrub. The spread of Hitchin and subsequent increase in the use of the Common for recreation probably had much to do with this (vandalism and car-borne picnic parties were a problem as early as 1926). Some of the important flora was also dependent on a small natural stream and artificial ditches which were maintained across the Common when it was used for grazing. Although these still exist, they have become choked with silt and weed, and their marginal flora has suffered.

Botanical history

The Common's botanical history is closely connected with changes in land use, water levels, etc., and cannot be viewed in isolation from them. Three hundred and twenty species of vascular plants have been recorded in the area under study since recording began. With all the identified varieties and hybrids, this total would probably be nearer 330. We are fortunate that more or less reliable and consecutive records of the flora have been made by botanists from about 1840 to the present. Early records are sketchy, consisting of those made by Isaac Brown, Joseph Pollard and others up to about 1870. The first relatively complete list is from a series of articles on the flora of the Hitchin region by T. B. Blow of Welwyn in 1880. Records made after 1900 fall mainly into three periods. J.E. Little, who was active locally from about 1910 to his death in 1934, made a fairly detailed survey of the Common's flora, including notes on the more common species which had been earlier ignored. The survey of the County flora made mainly between 1950 and 1962 by Dr Dony provides us with a good list for the Common (in manuscript form), although the method of field recording by 2km. squares which he adopted

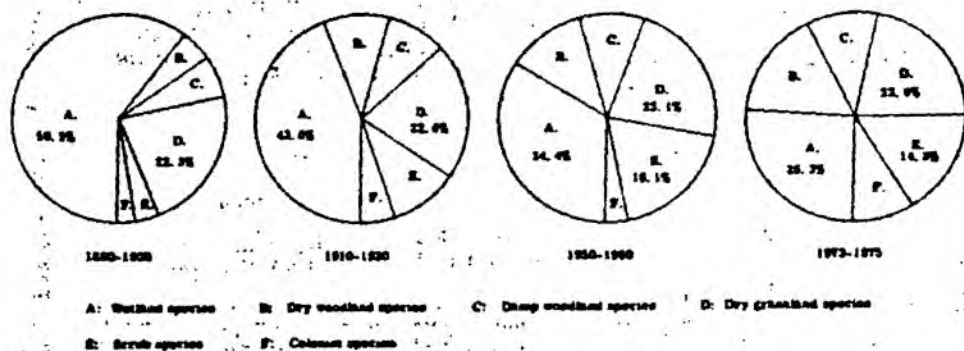
later meant that not all the species recorded for the appropriate squares can safely be assumed to exist on the Common itself. The present survey was commenced in 1973 in an attempt to compile a full species list for the Common and Nature Reserve, as well as to examine selected parts in detail.

Sources of information which give details of land management also provide clues to the past flora of the Common. Similarly, past flora records may, with care, give clues to past land management, although there is the danger of circular argument. The most important source of this information is the pictorial record of the area which can be built up from paintings and photographs. A series of water-colours by father and son, Samuel Lucas senior and junior between about 1840 and 1900 show details of the area at various seasons. Similarly, a collection of photographs by father and son, T. B. and T. W. Latchmore between 1865 and about 1939 gives a good idea of the appearance of the area at various times, which can be used to corroborate details from the paintings.

The nature of the flora during earlier periods is a matter for conjecture, especially as water levels have been controlled by the mill at least since the mid-18th century. The kinds of plants recorded at Oughton Head in the past, however, probably indicate that the flora was not of recent origin but had developed from natural marsh or fen remaining over from early times. In particular, the existence of rare species like Brookweed *Samolus valerandi*, Grass of Parnassus *Parnassia palustris*, Parsley Water Dropwort *Oenanthe lachenalii*, Bog Pimpernel *Anagallis tenella*, Bogbean *Menyanthes trifoliata*, Marsh Valerian *Valeriana dioica*, Southern Marsh Orchid *Dactylorhiza praetermissa*, Distant Sedge *Carex distans*, Tawny Sedge *C. hostiana*, Long-stalked Yellow Sedge *C. lepidocarpa*, Tufted Sedge *C. elata*, Lesser Tussock Sedge *C. diandra* and Dioecious Sedge *C. dioica*, as well as other species characteristic of East Anglian riverine fen, all support this idea. However well-managed the early landscape was, therefore, it is likely to have

Figure 1.

Oughton Head: relative habitat composition, 1880 - 1973.



remained a true wetland whose origins pre-date man's management of the habitat.

Analysis of past and present records illustrates the changes which have taken place over the last century. Figure 1 shows the results of analysing all available records. Presence or absence of all species in four main periods was tabulated and each species allotted according to its habitat preference to one of six broad habitat types. The proportions of species recorded for each habitat at each period were then assessed in order to demonstrate the nature of habitat change over the period 1880 to the present, and especially the change from a stable marshy meadow/fen/river environment to the present seral succession through scrub to dry woodland. The effect of other factors is also illustrated by this analysis, particularly water table reduction and habitat disturbance (especially noticeable with the increase of 'weed' species). The steady reduction in wetland species is paralleled by an increase in species of scrub and woodland. It is interesting to note that the proportion of species mainly associated with dry grassland has remained fairly constant throughout, no doubt because the wetland species have been replaced by these in the process of developing scrub.

There are limitations to the accuracy of this analysis. First, early records are incomplete, especially for the common species. An attempt has therefore been made to allow for this by assuming the presence of certain species if they have been recorded at other times and would have been likely to occur in the known habitats of the period in question. Second, the rigid allocation of species to habitats ignores their possible occurrence in other habitats. This applies particularly to scrub and dry grassland, or damp and dry woodland. This makes the habitat divisions to some extent unreliable, and therefore only general conclusions can be gained from the proportions indicated.

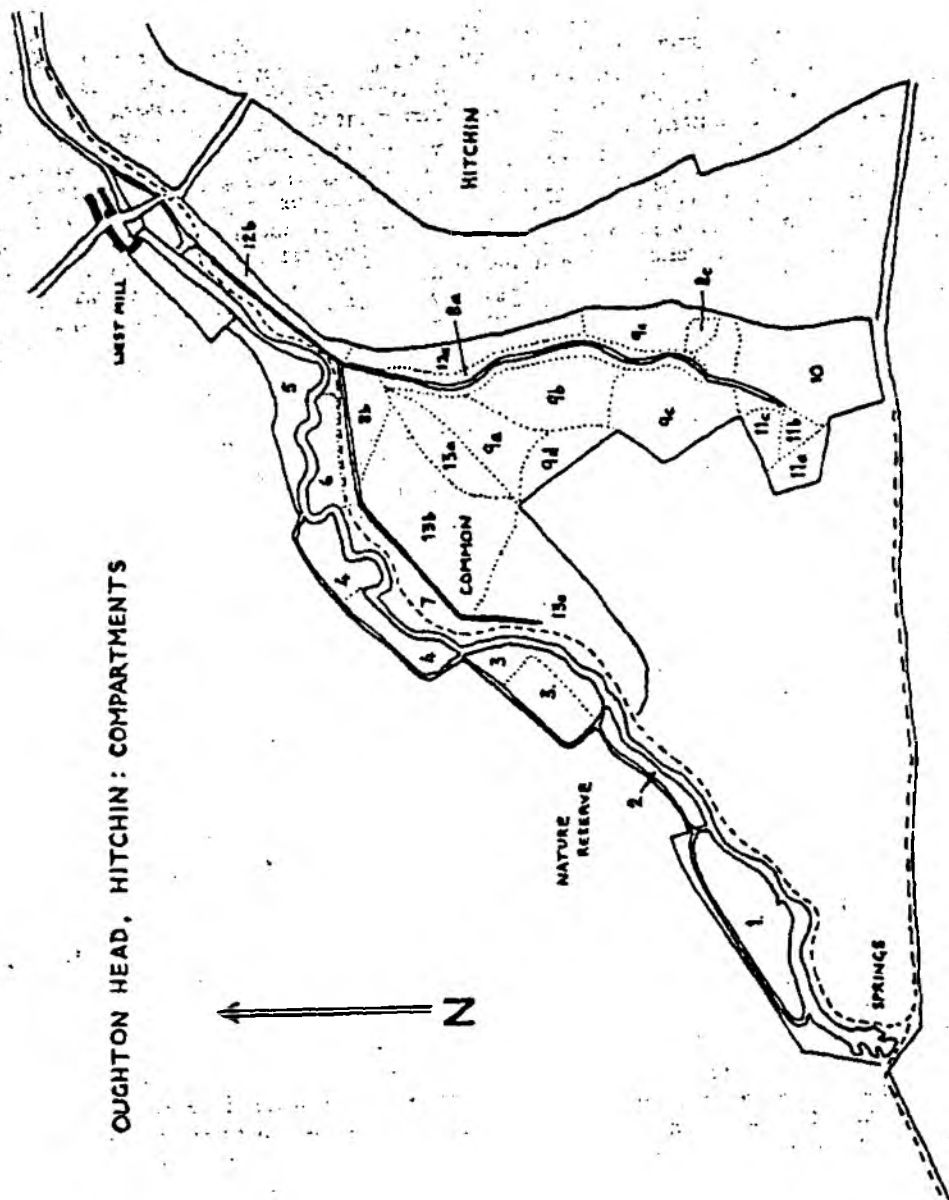
The present study

The establishment of an appropriate management plan for the area requires the collection of good information on the species present and only a most careful study of past and present flora can provide guidance for future action. The area was accordingly divided into compartments which reflected the main habitat divisions. Each compartment was first examined to build a full plant list, from which a total list for the area was compiled. Secondly, selected compartments were examined, using a quantitative sampling technique with a point-quadrat.

The overall species list hides the fact that several species are only just holding on. For example, Tormentil *Potentilla erecta*, Brown Sedge *C. disticha* and Water Dock *Rumex hydrolapatium* only occur in limited areas. Other sedges, for which the Common was once famous, are rapidly disappearing even from the marshy areas, while two of the Common's specialities, Southern Marsh Orchid and Marsh Valerian are mainly restricted to comparatively small areas. The development of the fen of the Nature Reserve is also restricting other species to marginal habitats, particularly Marsh Marigold *Caltha palustris*, Tussock Sedge *C. paniculata* and Yellow Iris *Iris pseudacorus*. Some species re-appear following management work, such as Lesser Spearwort *Ranunculus flammula* which appeared in a cleared ditch after an apparent absence of eighteen years; others may follow. Brookweed, for example, was present in 1880, last seen in 1920, but was re-discovered by a ditch in 1956, although it has not been seen again since.

The detailed study of selected parts of the flora emphasises the broader aspects of the habitats rather than the occurrence of particular scarce plants, and from that point of view better illustrates general habitat changes. Species diversity was assessed, as well as the proportion of cover of particular species, and the study

BOUGHTON HEAD, HITCHIN: COMPARTMENTS



areas chosen in order to illustrate the main habitats. More attention was paid to the wetlands than other habitats, because these are most at risk.

The Nature Reserve

The fen was divided into five compartments and three were studied in detail. The habitat is surprisingly varied and has developed in stages on plots of marshland. Compartment 5 was a bog, with Cotton Grass *Eriophorum angustifolium* as recently as 1920, and was planted with 'Cricket-bat Willows' *Salix alba* x *fragilis*. Subsequent development of Ash *Fraxinus excelsior* and Birch *Betula* spp. carr has nearly eliminated the former bog flora, and recent desiccation of the peat has produced stands of Nettles *Urtica dioica*. Other compartments also show the effects of planting. White Willow *S. alba* was planted in compartment 3, with some Elm *Ulmus* sp.. Otherwise, however, this and compartment 4 both show various stages of a similar succession. The stools of dead Tussock Sedge are dominated by Birch fen, itself being invaded by Oak *Quercus robur*. Compartment 3 shows a small percentage of Alder *Alnus glutinosa* spreading from compartments 1 and 2 where it is dominant. It was noted here as young trees in 1922, apparently having spread from planted trees south of the river and invading previously managed willow fen.

The shrub and ground floras of the reserve are varied and differ between compartments. Compartment 5 for example has appreciable amounts of Common Sallow *Salix cinerea*, while Hazel *Corylus avellana* is more widespread in the other compartments. Figures in Table 1 illustrate this variability.

The Common

While the succession of plants in the Reserve can be deduced from the survey, the Common's flora exhibits more variation, owing to interference with the natural habitat. The area was also divided into compartments, but with less precision, the only clearly defined areas being the two main marshy areas, 8a and 8b. The former is a strip of damp ground alongside the subsidiary stream across the Common, while the latter is the remnant of the former marshy meadowland which once stretched across most of the lower part of the Common. These two compartments differ considerably, the former being fairly rich, including the main colony of Southern Marsh Orchids, while the latter is less diverse, although supporting the remaining rare sedges. Evidence from the survey suggests that the original marsh community in compartment 8a of Red Fescue *Festuca rubra*, Cocksfoot *Dactylis glomerata* and Blunt-flowered Rush *Juncus subnodulosus* is being invaded by Oat Grass *Arrhenatherum elatius*. Tufted Hair-grass *Deschampsia caespitosa* is similarly invading compartment 8b, although this is also dominated by Oat Grass, with considerable stands of Meadowsweet *Filipendula ulmaria* and Hemp Agrimony *Eupatorium cannabinum*. Before the invasion of these coarser species, the meadowland was probably dominated by Yorkshire Fog *Holcus lanatus*, Blunt-flowered Rush and Red Fescue, with considerably larger populations of certain sedges, such as Lesser Pond Sedge *C. acutiformis* and Hammer Sedge *C. hirta*.

The drier parts of the meadow show a similar flora to compartment 8b but with greater variety and more coarse grasses. Oat Grass, Tufted Hair-grass and Tall Fescue *F. arundinacea* form a large proportion of the habitat, although finer grasses do survive in good quantity. The only marshland species present in numbers are Meadowsweet and Hammer Sedge. Elsewhere on the Common, each grassland community has a slightly different composition, the richest being compartment 10 at the drier end.

| | | | | |
|-------------|------------------------------|---------------|---------------|---------------|
| Field layer | Other species | 3.0 | 5.4 | 9.6 |
| | Grasses | 3.3 | 7.7 | 8.4 |
| | Sedges | - | 0.5 | - |
| | <i>Lonicera periclymenum</i> | 2.7 | 5.5 | 0.4 |
| | <i>Mercurialis perennis</i> | 41.0 | 4.5 | - |
| | <i>Circaea lutetiana</i> | 10.3 | 1.3 | - |
| | <i>Gallium aparine</i> | 6.0 | 3.0 | 59.2 |
| | <i>Hedera helix</i> | 43.7 | 54.0 | 28.4 |
| | <i>Urtica dioica</i> | 64.3 | 79.0 | 86.4 |
| Shrub layer | Other species | - | 2.9 | 9.0 |
| | <i>Rubus fruticosus</i> | 11.7 | 5.0 | 11.2 |
| | <i>Rosa canina</i> | 5.3 | 7.5 | 7.6 |
| | <i>Ligustrum vulgare</i> | 4.7 | 1.0 | - |
| | <i>Rhamnus catharticus</i> | - | 5.3 | - |
| | <i>Salix caprea</i> | - | 6.3 | 2.8 |
| | <i>Salix cinerea</i> | - | 8.3 | 15.2 |
| | <i>Sambucus nigra</i> | 12.7 | 4.0 | 1.6 |
| | <i>Crataegus monogyna</i> | 4.0 | 2.3 | 15.6 |
| | <i>Corylus avellana</i> | 32.7 | 24.0 | 1.6 |
| Canopy | <i>Prunus avium</i> | - | - | 4.0 |
| | <i>Betula pendula</i> | - | - | 16.0 |
| | <i>Alnus glutinosa</i> | 9.3 | - | - |
| | <i>Salix alba</i> | 16.7 | - | - |
| | <i>Salix fragilis</i> (x?) | - | - | 27.6 |
| | <i>Quercus robur</i> | 2.3 | 17.7 | 14.8 |
| | <i>Betula pubescens</i> | 85.3 | 55.7 | 25.6 |
| | <i>Fraxinus excelsior</i> | 32.3 | 30.5 | 32.0 |
| | | Compartment 3 | Compartment 4 | Compartment 5 |

Table 1. Plant communities in the Nature Reserve (percentage cover)

From the dominant species, the Common's herbaceous flora has suffered considerably. Certain plants still form part of the dominant community, especially Large Birdsfoot-trefoil *Lotus uliginosus*, Meadow Vetchling *Lathyrus pratensis* and Tufted Vetch *Vicia cracca* in various places. Interestingly, while Large Birdsfoot-trefoil is widespread in compartment 8a, it is infrequent in 8b, which illustrates the difference between these two adjacent wetland habitats. Most other species fall below 10% of the total cover everywhere, except local populations of Marsh Horsetail *Equisetum palustre* and some scrub species.

Apart from the open areas of the Common, other habitats were only summarily examined. Scrub species vary across the Common. Hawthorn *Crataegus monogyna* is dominant in most drier situations, but willow carr develops on former marshland with *Salix cinerea* and *S. caprea* predominant. Other species include Buckthorn *Rhamnus catharticus*, Guelder Rose *Viburnum opulus*, Privet *Ligustrum vulgare* and Hazel. Elm suckers have spread into the grassland in compartment 9d.

The quantitative survey

Samples of varying size were taken from each habitat studied, but were adjusted to a norm of 250 points per sample. From the samples it has been possible to calculate the percentage cover of the main species in each compartment studied. The results are shown in Table 1 for the nature reserve and in Table 2 for the Common. To avoid confusion, only species with 4% ground cover or more in at least one compartment are tabulated. This gives some idea of the basic species composition, although it does not reflect the real diversity in each compartment. In the tabulation, some attempt has been made to separate species according to the overall type of habitat indicated, so that the habitat pattern can be assessed at a glance.

Species diversity

Species diversity is often used as a tool in management to indicate 'better' habitat. The validity of this approach is doubtful, but diversity linked with the presence of unusual species is also useful in indicating the richness and stability of a particular habitat.

Two methods of calculating species diversity indices were used, and these gave slightly different results. The first, more usual method, reflects the ratio of the total number of contacts in the sample to the total species list of the area surveyed. This is obviously an open-ended calculation, as the total number of species in a large area of grassland is difficult to find. However, it does reflect to a great extent the overall richness of the area. Another method was tried, involving a calculation with the total number of contacts as before, but in proportion to the total number of species actually contacted during the survey. This gives a figure which relates specifically to the sampled area at one particular time, and might be seen to give a truer picture of the existing richness of the sampled area. The two equations for calculation were:

$$(a) \frac{\text{no. of species} - 1}{\text{log. of contacts}} \quad (b) \frac{\text{no. of species contacted} - 1}{\text{log. of contacts}}$$

and the results from each are shown in Table 2, columns (a) and (b) respectively.

The difference between the two methods of calculating diversity can be seen in the relative interpretation of results from compartments 8a, 10 and 13b. The second method (b) shows 8a to be clearly more diverse than the other two, which are more or less equally interesting. The more usual method (a), however, gives a higher index figure, and places compartment 10 at the top of the list. While this compartment is more varied than one would imagine, its diversity relies upon many occasional species rather than the more uniform but more genuinely varied community in 8a.

| | COMPARTMENT 6 Dewillet sedge marsh | COMPARTMENT 8a Basic marsh grassland | COMPARTMENT 8b Sedge marsh | COMPARTMENT 9a Sedge grass with scrub | COMPARTMENT 10 Dry grass | COMPARTMENT 13b Sedge grass, former marsh |
|--|---|---|----------------------------------|--|--------------------------------|--|
| Grasses | | | | | | |
| <i>Salix lanatum</i> | | | | | | |
| <i>Dactylis glomerata</i> | | | | | | |
| <i>Poa trivialis</i> | | | | | | |
| <i>Festuca rubra</i> | | | | | | |
| <i>Festuca ovina</i> | | | | | | |
| <i>Festuca pratensis</i> | | | | | | |
| <i>Phleum pratense</i> | | | | | | |
| <i>Phalaris arundinacea</i> | | | | | | |
| <i>Festuca arundinacea</i> | | | | | | |
| <i>Arrhenatherum elatius</i> | | | | | | |
| <i>Deschampsia caespitosa</i> | | | | | | |
| <i>Agropyron repens</i> | | | | | | |
| OTHER SPECIES | | | | | | |
| Sedges | | | | | | |
| <i>Carex acutiformis</i> | | | | | | |
| <i>Carex hirta</i> | | | | | | |
| OTHER SPECIES | | | | | | |
| Rushes | | | | | | |
| <i>Juncus subnodulosus</i> | | | | | | |
| <i>Juncus inflexus</i> | | | | | | |
| <i>Juncus effusus</i> | | | | | | |
| OTHER SPECIES | | | | | | |
| Other Flowering Plants | | | | | | |
| <i>Lathyrus pratensis</i> | | | | | | |
| <i>Vicia cracca</i> | | | | | | |
| <i>Lotus uliginosus</i> | | | | | | |
| <i>Angelica sylvestris</i> | | | | | | |
| <i>Ranunculus repens</i> | | | | | | |
| <i>Equisetum palustre</i> | | | | | | |
| <i>Equisetum arvense</i> | | | | | | |
| <i>Plantago reptans</i> | | | | | | |
| <i>Galium verum</i> | | | | | | |
| <i>Centauria nigra</i> | | | | | | |
| <i>Achillea millefolium</i> | | | | | | |
| <i>Poterium sanguisorba</i> | | | | | | |
| <i>Galium aparine</i> | | | | | | |
| <i>Eupatorium cannabinum</i> | | | | | | |
| <i>Cirsium palustre</i> | | | | | | |
| <i>Epilobium hirsutum</i> | | | | | | |
| <i>Filipendula ulmaria</i> | | | | | | |
| <i>Cirsium arvense</i> | | | | | | |
| <i>Lamium album</i> | | | | | | |
| <i>Galatella sepium</i> | | | | | | |
| <i>Urtica dioica</i> | | | | | | |
| <i>Morus fruticosus</i> | | | | | | |
| <i>Crataegus monogyna</i> | | | | | | |
| OTHER SPECIES | | | | | | |
| DIVERSITY INDICES | 11.17 | 22.05 | 15.86 | 21.01 | 24.65 | 22.24 |
| a | 7.21 | 15.53 | 10.69 | 11.02 | 12.32 | 10.32 |
| b | | | | | | |
| SAMPLE (Total no. of contacts made) | 150 | 200 | 200 | 200 | 150 | 300 |

Table 2.

Plant cover and species diversity (Histograms represent percentage of ground covered by each species).

Comparison with other sites

A recent study of a small marsh at Norton Common, Letchworth, (Sawford, 1974) concerned a similar habitat, boulder-clay marshland, but without the desiccation problem of Oughton Head. Comparison between the two sites can be made both through the species diversity indices, and the relative cover of particular species. Unfortunately, only method (a) was used to calculate diversity, and therefore comparisons with the perhaps more strictly accurate method (b) are not possible. The marsh at Norton Common had a species diversity of 20.52, comparing with 22.65 for the marsh community in compartment 8a at Oughton Head, which is not suffering so badly from desiccation and has remained fairly stable. The effect of desiccation and invasion by coarse species, however, can be seen in the diversity index of compartment 8b which was 15.86.

The real difference between the two sites, however, comes out in a comparison of species cover. Firstly, two species are present in quantity at Norton Common but absent from Oughton Head in the same quantity: Water Mint *Mentha aquatica* and Marsh Pennywort *Hydrocotyle vulgaris*; the latter being no longer at Oughton Head at all. However, the reverse is also true of other species. Large Birdsfoot-trefoil, Meadow Vetchling and Reed-grass *Phalaris arundinacea* are three such species. The Blunt-flowered Rush is frequent at both sites, but one of the other co-dominants at Oughton Head, Yorkshire Fog, is far less frequent at Norton Common. A comparison between compartment 8b and Norton Common reveals more similarities, although the former is drying out. Relatively low coverage of Cocksfoot and Red Fescue, as opposed to Oat Grass and Tufted Hair-grass, is a feature of both. At Oughton Head, however, Blunt-flowered Rush is less frequent, owing to the drier conditions. It is interesting that Marsh Pennywort once used to exist in compartment 8b, and so we appear to have two essentially similar habitats, one of which has suffered from drying out.

It is from tentative comparisons like this that tendencies within a habitat can be deduced. We can also be a little more sure what the original habitat of the wet meadow at Oughton Head would have been. If the marsh at Norton Common, itself undergoing change, represents a similar habitat to what compartment 8b (and presumably 13b also) at Oughton Head was once, then we can judge the effects of desiccation on this kind of grassland, and perhaps attempt to remedy the situation.

Even with a fairly detailed survey of the area, much remains to be studied to give a full picture of the flora of the site. The quantitative study of the nature reserve has thrown up some interesting questions which are not easily answered, such as the relative age of the various stands of woodland. In compartment 3, for example, Dog's Mercury *Mercurialis perennis* occurs in good quantity, while it is less common in compartment 4 and absent from compartment 5. We know that compartment 5 was an open habitat but we do not know the original composition of the other two compartments. The existence of a species like Dog's Mercury would suggest the existence of some kind of woodland over a considerable period, and yet higher water levels would surely have meant that wet fen carr was the original habitat. Other questions concern the local distribution of some plants, such as Wild Cherry *Prunus avium*, and the varying colonising abilities demonstrated by various species such as Oak and Ash.

The process of management in the future will have a fundamental influence on the survival of species. Management in the Nature Reserve is under way and changes have occurred since the original survey was carried out. Some work on the coarse vegetation of the Common has been carried out, and it is hoped to try and remedy some of the problems of water levels, within the restrictions of land drainage requirements and available water. The data from both past and more recent surveys are being provided to the knowledge of the management committee.

Notes on the rarer species

The following species are selected to illustrate the gradual alteration and degradation of habitat at Oughton Head. The records are taken from a variety of sources, in particular the field records and specimens of T. B. Blow, A. R. Pryor, J. E. Little, J. G. Dony, H. Brown, D. Meyer, J. Pollard, W. Dawson and J. D. Morell, as well as records from the recent survey. The initials of the appropriate recorder are given and the dates of relevant records. Full details of all records and the complete species list for the area are retained in North Hertfordshire Museums Natural History Department.

Polypodium vulgare In willow pollards (Letchworth Naturalists Society), 1908.

Last record (D. Meyer), 1958.

Ophioglossum vulgatum First record (TBB), ca 1880. Still present.

Ranunculus flammula First record (WD), 1837. Disappeared, 1956. Re-appeared after ditching, 1975.

R. penicillatus First record (ARP), 1886. Still present.

Polygala vulgaris Only record (TBB), 1880.

Sagina nodosa First record (WD), 1837. Last record (TBB), 1880.

Ononis spinosa First record (JEL), 1910. Still present.

Trifolium striatum First record (JP), 1868. Last record (JEL), ca 1910.

T. fragiferum First record (WD), 1837. Last record (British Naturalists Association), 1957.

Potentilla erecta 'Abundant, 1880' (TBB). Rare, 1977.

Parnassia palustris First record (JDM), ca 1835. Last record (JEL), 1910 (field notebook).

Epilobium palustre First record (TBB), 1880. Last record, 'few' (JEL), 1921.

Hippuris vulgaris First record (WD), 1837. Still present, rare.

Oenanthe fistulosa First record (HB), ca 1839. Not known by JEL.

O. lachenalii First record (Isaac Brown), 1844. Last record (Joshua Lamb), 1934.

Berula erecta First record (JEL), 1910. Still present.

Hydrocotyle vulgaris First record (WD), 1837. Last record, 'a little' (DM), 1959.

Rumex hydrolapathum First record (JEL), 1921. Still present, rare.

Salix pentandra First record (JEL), 1921. Still present.

Samolus valerandi First record (WD), 1837. Recorded (TBB), 1880; (JEL) until 1920. rediscovered (E. Bangerter), 1956.

Anagallis tenella First record (JDM), ca 1835. 'Frequent by the ditches cut on the Common' (TBB), 1880. Not recorded since.

Menyanthes trifoliata First record (WD), 1837. 'Very abundant' (TBB), 1880.

'Plenty' (DM), 1958. Destroyed by dredging, 1959.

Pedicularis palustris Only record (WD), 1837.

Pinguicula vulgaris 'In a ditch near West Mill, now filled up' (WD), 1837.

Galium uliginosum First record (JP), 1868. Still present.

Valeriana dioica First record (WD), 1837. Still present, but rare.

Taraxacum palustre Only record (JEL), 1912, 1913.

Hydrocharis morsus-ranae Only record (JP), 1868.

Triglochin palustre First record (HB), 1839. Last record (D. Meyer), 1959.

Juncus subnodulosus First record (HB), 1838. Still present.

Dactylorhiza praetermissa First record (JDM), ca 1835. Still present.

Ophrys apifera Recorded (JEL), 1896-1924.

O. insectifera First record (JDM), ca 1835. Last record (T. Lucas), 1912.

Eriophorum angustifolium First record (WD), 1837. Last record (in Dony, 1967), 1939.

Carex rostrata First record (JDM), ca 1835. Last record (JEL), 1921.

C. distans First record (TBB), 1880. Last record (JGD), 1959.

C. hostiana First record (J. Groves), 1878. Last record (JEL), 1910.

C. panicea First record (JEL), 1910. Last record (JGD), 1959.

C. nigra First record (JEL), 1910. Still present, but rare.

C. elata First record (Woods), 1840 (in Pryor, 1887). Last record (British

Naturalists Society), 1957.

C. acuta Only record (TBB), 1880.

C. paniculata Only record (TBB), 1880.
C. paniculata First record (TBB), 1880. Still present.
C. richardsonii First record (W.H. Coleman), 1849. Still present.
C. troica First record, 'near the river' (JDM), ca 1835. Last record (J. Groves), 1878.
C. pulicaris Only record (TBB), 1880.
C. diandra Only record (TBB), 1880.
C. echinata Only record (TBB), 1880.
Blysmus compressus Only record (JDM), ca 1835.
Molinia caerulea First record (JEL), 1928. Last record (DM), 1948.
Briza media First record (H. C. Littlebury), 1913. Last record (JGD), 1959.
Koeleria cristata Only record (ARP), 1886.

Acknowledgements

Much assistance in the field survey was given by Brian Sawford, and advice by Dr J. G. Dony. Apart from manuscript sources held by Hitchin Museum, records were examined for the Nature Reserve at Hertford County Record Office. Information from the Lucas watercolours mainly derives from the collections of Hitchin Museum but the collection of the late Mr F. Shillitoe also furnished some important views.

References

Published works

- Blow, T. B. (1880). 'Outlines of a flora of the Hitchin region', *Hertfordshire Express*. A series of articles.
 Dony, John G. (1967) *Flora of Hertfordshire*. Hitchin: Hitchin Museum.
 Pryor, A. R. (1887) *A Flora of Hertfordshire*, London: Gurney & Jackson.
 Sawford, B. R. (1974) 'The vegetation of a marsh at Norton Common, Letchworth', *Trans. HNHS*, XXVII, pp.303-6.
 Webb, R. H. and Coleman, W. H. (1849) *Flora Hertfordiensis*, London: William Pamplin.

Manuscript sources

- British Naturalists Association. Hertfordshire and North Middlesex Branch: *Bulletins*, 1950-, especially 1957. (Privately circulated typescript).
 Brown, Henry: *Catalogue of the Herbarium of Henry Brown*. (North Herts. Museums. Herbarium housed at the British Museum (Natural History)).
 Dawson, William: *List of a Few Plants Found in the Neighbourhood of Hitchin*, 1837. (North Herts. Museums).
 Dony, John G.: Annotated card index, based on Pryor's *Flora of Hertfordshire*, 1951-ca 1960. (North Herts. Museums).
 Letchworth Naturalists Society: Minute books, 1908-; Botanical reports. (North Herts. Museums).
 Little, J. E.: *Flora of Herts.: supplementary records*. (North Herts. Museums).
 Little, J. E.: Field notebooks, 1910-34. 14 volumes. (North Herts. Museums).
 Meyer, D.: Botanical notes regarding Oughton Head. (North Herts. Museums).
 Morell, J. D.: Annotations to sheets of Turner and Dillwyn's *Botanist's Guide to England and Wales* concerning Hertfordshire, ca 1835. (North Herts. Museums).
 North Hertfordshire Museums Natural History Department: card index of records for Oughton Head, 1973-
 Pollard, J.: List of plants, ca 1868. Four sheets stitched together. (North Herts. Museums).

Herbaria

The following herbaria were consulted in the study, all housed at North Herts. Museums Natural History Department: Hertfordshire County Herbarium (including material from Dr J. G. Dony); J. Pollard; H. C. Littlebury; Letchworth Naturalists Society (including T. A. Dymes); M. S. and H. Phillips; A. W. Graveson.

The Spotted Cat's Ear *Hypochoeris maculata*

Trevor J. James

Dr Dony in his *Flora of Hertfordshire*, stating that this nationally rare plant (only thirteen stations recorded in the *Red Data Book*) was made at Therfield Heath.

In 1978, during her Rare Plants Survey, I examined the distribution of the plant on the site. During her work, I found a negative in the A. W. Graveson collection of a non-flowering rosette of the species, labelled 'Hypochoeris maculata'. I recently, was contacted to confirm this, a recollection of the plant, he and his father took in 1924, when this photograph was taken.

Despite the long delay in bringing this first authenticated record for the County even more support to the note in Webb & H. Fordham 'thinks he has seen this on Roy's

References

- Dony, John G. (1967) *Flora of Hertfordshire*. Hitchin: Hitchin Museum.
 Perring, F. H. and Farrell, L. for SPNC (1977) *British Flora*. Nettleham, Lincoln: Society for the Promotion of the Study of British Flora.
 Webb, R. H. and Coleman W. H. (1843) *A Report on the Flora of Hertfordshire*. Hertford: The Author.

OUGHTON HEAD COMMON

Summary of facts concerning the history and natural history of the Common.

1. Origins

- 1.1. The river Oughton rises from a complex of springs at Oughton Head, deriving from a hard layer of the Middle Chalk called Melbourn Rock.
- 1.2. Post-glacial deposits in the Hitchin area blocked the course of the river from West Mill area eastwards, creating a large marshy hollow, which now forms most of the Common.

2. Ecology

- 2.1. Chalk-water flowing through accumulating peat from marshy vegetation produces natural fen. Oughton Head has affinities with the more well-known fens of East Anglia.
- 2.2. Mixed fen vegetation developed naturally, but has been modified by man's clearance of the original swamp and subsequent management.
- 2.3. North of the river swamp lands have been used to provide willows for fencing and firewood etc. South of the river, rough grazing has been maintained and has created a large area of marshy pasture.

3. History

- 3.1. The Common has probably been continuously grazed from early times, as the land would have been unsuitable for agriculture.
- 3.2. The Common formed an essential part of the common field system of Medieval Hitchin, allowing the grazing of cattle by the commoners while crops were growing in the other common fields.
- 3.3. Common right to graze was held by householders in houses built by 1572, or on the site of one built by then. Each commoner could graze 2 cows and 1 bullock each on the town commons.
- 3.4. A herd boy looked after the cattle by day, and they were returned to their owners by night. Access to the common was by the present bridleway, Oughton Head Lane, then also the road to Pirton. Grazing was allowed between 13th May and 14th February.
- 3.5. The commoners were also required to maintain ditches and fences on the Common.
- 3.6. Grazing decreased slowly, but finally stopped about 1914.
- 3.7. Recent use of the Common has been for public recreation only. Picnic parties became increasingly popular from 1920, and access by motor cars introduced problems from wear of the grass.
- 3.8. Development of Hitchin after 1920 brought the West Mill estate close to the Common's boundary by 1960.

4. The River

- 4.1. River levels have been decreasing for at least 150 years.
- 4.2. The mill at West Mill was built about 1600, but river levels became too low for its operation by the mid 19th century.
- 4.3. The millstream was raised about this time to give more power to the mill, and this probably increased the already wet conditions of the Common.
- 4.4. West Mill became uneconomic some time before 1912, and was burned down in 1960.
- 4.5. The river was dredged and the river level lowered again about the same time by the Great Ouse Water Authority and the Hertfordshire County Council, in order to drain neighbouring farmland. This has accelerated drying of the Common and a further reduction in river levels.
- 4.6. Water extraction from the chalk for public use began to affect river levels about 1920 when wells were bored at Charlton.
- 4.7. Oughton Head Well was sunk in 1944 and is licensed to abstract 365 million gallons per year. In 1973, 244.8 million gallons were abstracted, more than $\frac{1}{3}$ of Hitchin and district's annual demand. Demand for water is increasing.

5. Oughton Head Common and the law

- 5.1 The Common owes its status as a public open space to its former role as a common grazing for the town. In 1899, an act of Parliament declared that town commons should be available for public recreation.
- 5.2 The Commons Registration Act, 1967, required all Commons to be registered, along with their common rights.
- 5.3 The Oughton Head Common, and other Commons in the township of Hitchin were registered by Hitchin Urban District Council, but no commoner registered his common rights, and therefore no right to graze cattle now exists. There are no other rights of the public over the Common, except rights of way.
- 5.4 One right of way: a "road used as a public path", follows the river from the springs to the mill, across the common. Such a right of way indicates that all classes of vehicle have a right to its use, but that the Highway Authority is not obliged to maintain it as other than a footpath.
- 5.5 Byelaws affecting the Common were drawn up in 1922, and include restrictions on cutting wood, catching birds, camping, bathing, etc. The carriage or use of firearms is also prohibited.
- 5.6 The Common and neighbouring woodland, with the springs, were declared a Site of Special Scientific Interest in 1953, to protect their wildlife, but this was revoked in 1970, owing to deterioration of their importance.

6. Wildlife

- 6.1 Over 300 species of wild plant have been recorded, including many rare marshland species. Many have disappeared since the grazing of cattle ceased and since river levels declined.
- 6.2 Over 130 species of wild bird have occurred at the Common, many rare in Hertfordshire, including Bittern, Bearded Tit, Little Crake, Red-backed Shrike.
- 6.3 A wide range of insects: butterflies, moths, beetles, grasshoppers etc., as well as other groups such as spiders and molluscs, inhabit the Common.
- 6.4 The River and ditches are important local breeding areas for toads and frogs, and the River has supported a wide range of fish, including Trout, in the past, although is now less important.

7. Problems of present use and management

- 7.1 Vandalism caused by local children is considerable, ranging from destruction of trees to lighting of fires, rubbish dumping, injury to wildlife, nest robbing, etc.
- 7.2 Theft of peat, timber, and the shooting of wildlife for sport and food is occasional but regular.
- 7.3 Illegal use of the Common for motorcycle riding and horse-riding is regular.
- 7.4 Camping by gipsies and others, with subsequent rubbish dumping is regular.
- 7.5 The open ground of the Common has not been mown or grazed for 60 years and is becoming overgrown with bushes.
- 7.6 Ditches have not been cleared since grazing ceased. River cleaning has not been maintained except by the use of weedkillers and the dredging carried out in 1959. Fallen trees have been cleared occasionally.

T. J. James

North Herts Museums Service
October, 1977

**INVERTEBRATE SITE REGISTER
MASTER FORM**

11 / 001

Site number

89/30

Name(s)

OUGHTON HEAD

County(s)

Hertfordshire

Grid Ref.

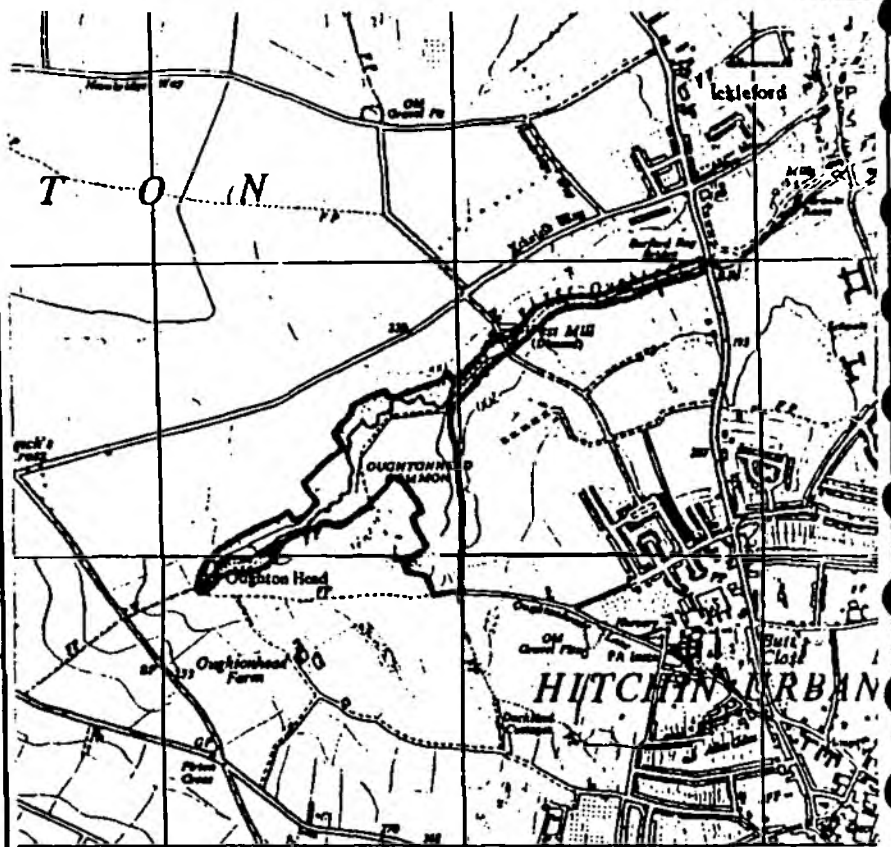
TL188304

Grade

C

Status

Descheduled SSSI
County trust reserve
Public Authority



Site description - Habitat

Mature alder and willow woodland, and springs supporting marsh.

Invertebrate interest - Coverage

The springs contain two species of coldwater flatworms, which in this part of the country are uncommon and confined to springs. Molluscs, Coleoptera, Trichoptera, Arachnida and Lepidoptera have been recorded. Though there are a number of local species in various of these groups, nationally uncommon species are few, and mostly of some age. The mollusc records show a quite rich fauna, and include several local species.

Comments - Conservation

The site has undoubtedly deteriorated: much of the marsh flora has been lost in recent years, and some of the fauna has no doubt also vanished. Nevertheless, it is still of invertebrate interest, and there is scope for further recording work in several groups. The chief management requirement is the maintenance of high water levels in the marsh: current management also aims to control sycamore invasion in the woodland.

Red Data Book and Notable species recorded for DOUGHTON HEAD

"a

| | | | |
|--|------------------|-------|-----------------|
| <i>Vertigo aculinsiana</i> | MOL:Vertiginidae | 1880? | Stratton(1954) |
| Habitat indicator of Reedbed, Fen, Carr or grazing marsh (2) | | | |
| <i>Aromia nuchata</i> (L., 1758) | COL:Cerambycidae | 1934 | Verdcourt(1984) |
| Musk beetle | | | |

Notable/Nb

| | | | |
|---|------------------|------|----------------------------|
| <i>Agapanthia villosa viridescens</i> (D) | COL:Cerambycidae | 1971 | Hertfordshire and Middlese |
|---|------------------|------|----------------------------|

Local

| | | | |
|--|-------------------|-----------|----------------------------|
| <i>Crenobia alpina</i> | TRI:Planariidae | 1963 | Ball(1964) |
| <i>Vertigo antivertigo</i> | MOL:Vertiginidae | 1880? | Stratton(1954) |
| Habitat indicator of Reedbed, Fen, Carr or grazing marsh (2) | | | |
| <i>Phloeophagus lignarius</i> (Marsham, | COL:Curculionidae | 1986 | Hertfordshire and Middlese |
| <i>Argynnis paphia</i> | LEP:Nymphalidae | 1981 | North Hertfordshire Biolog |
| 1608, Silver-washed Fritillary | | | |
| Possibly Released. | | | |
| <i>Lygephila pastinum</i> | LEP:Noctuidae | 1975 | Hertfordshire and Middlese |
| 2466, Blackneck | | | |
| <i>Dicymbium nigrum</i> (Blackwall) | ARA:Linyphiidae | 1982-1984 | Nellist, Dr D.R. |
| <i>Dismodicus bifrons</i> (Blackwall) | ARA:Linyphiidae | 1982-1984 | Nellist, Dr D.R. |
| <i>Xysticus ulmi</i> (Hahn) | ARA:Thomisidae | 1982-1984 | Nellist, Dr D.R. |

11 species listed

Invertebrate Index = 40

| | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|
| NATURE CONSERVANCY COUNCIL INVERTEBRATE SITE REGISTER | SITE NAME <i>DOUGHTON HEAD</i> | | GRID REFERENCE <table border="1"><tr><td>T</td><td>L</td><td>1</td><td>6</td><td>6</td><td>3</td><td>0</td><td>4</td></tr></table> | | T | L | 1 | 6 | 6 | 3 | 0 | 4 |
| | T | L | 1 | 6 | 6 | 3 | 0 | 4 | | | | |
| | DATE OR PERIOD OF VISITS <i>May 1982 to June 1984.</i> | | MODERN COUNTY <i>HERTS.</i> | | | | | | | | | |
| | RECORDER <i>D. Nellist</i> | | ALTITUDE M. <i>65 approx.</i> | | | | | | | | | |
| | | | | | | | | | | | | |

| | |
|--|--|
| <p>Site Status</p> <p>National Nat. Res. <input type="checkbox"/></p> <p>RSPB Reserve <input type="checkbox"/></p> <p>County Trust Res. <input checked="" type="checkbox"/></p> <p>SSSI <input type="checkbox"/></p> <p>Local Authority <input type="checkbox"/></p> <p>Common Land <input type="checkbox"/></p> <p>Forestry Commission <input type="checkbox"/></p> <p>Min. of Defence <input type="checkbox"/></p> <p>National Trust <input type="checkbox"/></p> <p>Private Owner <input type="checkbox"/></p> <p>Other, please state <input type="checkbox"/></p> <p>Confidentiality</p> <p>At discretion of NCC <input type="checkbox"/></p> <p>Consult recorder <input type="checkbox"/></p> | <p>Sketch Map (showing main areas of invertebrate interest)</p> |
|--|--|

Site Description (habitats of interest)

Mature Alder/Willow woodland. Discrete marshy areas.

Main Invertebrate Interest

little systematic recording as far as I know.

General Comments (Site importance, conservation problems etc)

Site is owned by Herts & Middx Trust.

(Please use back of sheet for further details - eg species lists, literature ref. etc)

Office use

Inverte Records

From Oughtonhead Common

Ephemeroptera

| | | |
|----------------------------|----------|----------------------------|
| <u>Ephemerella vulgata</u> | c. 1930. | R. Palmer in "Hine" p 108. |
| <u>Ephemerella danica</u> | c. 1930. | R. Palmer |
| <u>Baetis bicuspidatus</u> | - | - |
| <u>Baetis scambus</u> | - | - |
| <u>Baetis sp.</u> | c. 1965. | A. Trotman |
| <u>Cloëon</u> | c. 1965. | A. Trotman. |
| <u>Ephemerella ignita</u> | c. 1965. | A. Trotman. |

Odonata

| | | |
|---------------------------------|---------------|---|
| <u>Anax imperator</u> (Leach) | c. 1930. | (R. Palmer.) E Sharpe |
| <u>Sympetrum striolatum</u> | c. 1930. | R. Palmer. in "Hine" |
| [<u>Calopteryx splendens</u>] | c. 1930 | "at R. Oughton" in "Hine" |
| [<u>Agrion puella</u>] | c. 1930 | "in all suitable localities" R. Palmer. |
| [<u>Aeschna mixta</u> .] | 1 on 25.9.77. | T. James. — needs checking. |
| <u>Aeschna grandis</u> | 1975 | T. James. |
| <u>A. grandis</u> | 1977. | R. Webb |
| <u>A. cyanea</u> | 1977. | R. Webb. |
| <u>Agrion splendens</u> | 1977 | R. W. |
| <u>Ischnura elegans</u> | 20/7/81. | BRS/TJ. (one). |
| <u>Sympetrum striolatum</u> | 27/8/80. | TJ. |

..... HETEROPTERA.....

Velia cuneus, 1930. R. Palmer. in "Hine" p 113.

Nepa cinerea c 1965. A. Trotman

..... HOMOPTERA.....

Aphrophora alni 1930. R. Palmer. in "Hine" p 115.

Psylla alni c 1930. R. Palmer - - -

Psylla foersteri 1969. B. Ing. (Herts Trans. 27, 3, p 113).

Trichocheilus waltheri 1969. B. Ing. (- - - p 115)

TRICHOPTERA.

Anabolia nervosa. "very common" ^{c. 1930.} "in autumn." R. Palmer.
c. 1965 (Trotman).

Halesus digitatus Oct. 1925. R. Palmer

Chaetopteryx villosa "in autumn - uncommon." R. Palmer

Sericostoma personatum May 1922 R. Palmer.

Sericostoma sp. c. 1965 frequent. A. Trotman

Leptocerus aterimus "Common in spring" R. Palmer.

Limnophilus lanatus. "very common" R. Palmer. (1930s)

1969 - P. Taylor.

Limnophilus sp. c. 1965. A. Trotman.

Agapetus sp. : abundant c. 1965. A. Trotman.

Apatidea fimbriata. 1. Sep. 1969. P. Taylor.

Potomophylax circulator 1. Sep. 1969. P. Taylor.

Agroylea sp. frequent c. 1965 A. Trotman.

Stenophylax sp. occasional 1. 1965 A. Trotman.

DIPTERA : CHIRONOMIDAE

Chironomus plumosus. c 1965. A. Trotman

DIPTERA : SIMULIDAE.

Simulium spp. Abundant c 1965. A. Trotman.

COLEOPTERA : HELODIDAE

Heloda sp. : larvae in stream a common, abundant. c1965. A. Trotman.

COLEOPTERA : DYTISCIDAE

Dytiscus marginalis : R. Oughton. c1965. A. Trotman.

Hydroporus sp. c1965. A. Trotman.

Hyphydrous ovatus c1965. A. Trotman.

Agabus sp. c1965 A. Trotman.

COLEOPTERA

CARABIDAE

| SPECIES | DATE | NOTES. |
|------------------------------|-------|-------------------------|
| <i>Notiophilus aquaticus</i> | 1925. | R. Palmer in Hine p 142 |
| <i>N. palustris</i> | 1923. | R. Palmer - - - |

COLEOPTERA.

LUCANIDAE

Dorcus parallelepipedus : 1 at O. Head, 5/7/78 T.J.
 " " 1 found ~~at~~ in river, 25/10/78.

COLEOPTERA

POLYPHAGA: ~~CLAVICORNIA~~ MYCETOPHAGIDAE, COCCINELLIDAE etc

| SPECIES | DATE | NOTES |
|--------------------------------------|----------|---|
| <i>Mycetophagus quadripustulatus</i> | 1930 | "fairly common" R. Palmer in Hine p 146 |
| <i>Coccinella septempunctata</i> | 1975. + | T. J. |
| <i>Propylaea 14-punctata</i> | 13/4/80. | TJ. |
| <i>Chilocorus renipustulatus</i> | 13/4/80. | "several on willows" T. J. |

COLEOPTERA

PHYTOPHAGA: CERAMBYCIDAE

| SPECIES | DATE | NOTES |
|---|-----------|---|
| <i>Aronia moschata</i> | 1930. | Rarely. R. Palmer in Hine p 147 |
| <i>Agapanthia villosa</i> ^{villosa} lincolniensis | July 1924 | on Thistle etc. R. Palmer in Hine p 147. |
| <i>Aronia moschata</i> | 1974 | (also taken by R. Ferry 1950. 1940) 1 seen in flight TJ. |

CURCULIONIDAE

| SPECIES | DATE | NOTES. | |
|--|----------|--------------------|------|
| <i>Eutrichapion vorax</i> | 13/4/80. | 1 on Dogs Mercury. | T.J. |
| <i>Phyllobius pyri</i> | 16/5/80. | 1 | T.J. |
| <i>Rhycolites (Caenothinus) aequatus</i> | 24/4/80 | 1 in flight. | T.J. |

CRUSTACEA: ISOPODA.

Asellus aquaticus : frequent 1965. A. Trotman.

CRUSTACEA:

BRANCHIURA [Fish Lice].

Argulus foliaceus - R. Palmer in "Nat. Hist. Hist. Reg." p 97

CRUSTACEA: AMPHIPODA

Gammarus spp. : v. abundant. 1965, A. Totman.

Gammarus pulex : v. abundant. 1965. A. Totman.

Gammarus sp. : abundant 12-3-78 T.J.

| | | |
|---------|---|-----------------------|
| 5216-30 | LOCALITY Oughton Head Commn, nr Hitchin | DATE 8.1968 |
| 7.13/0 | HABITAT river, marsh, and banks | V.C. Herts |
| | | ALT. |
| | | RECORDER H.K. (Kenny) |

| | | | | | | | | |
|-----|------------------|----------------|-----|--------|------|------|--------|-----|
| 1 | Tbood | flu | 60 | Verti | sub | 121 | Arion | h |
| 2 | Vlrip | viv | 61 | | pyg | 122 | | at |
| 3 | | con | 62 | | gen | 122 | | at |
| 4 | Valva | cri | 63 | | mou | 123 | | ri |
| 5 | | mac | 64 | | lit | 124 | Lucen | ri |
| 6 | | pis | 65 | | alp | 125 | Vitre | cri |
| 7 | Pomat | ele | 66 | | ang | 125a | cry | q |
| 8 | Acicu | fus | 67 | Pupill | mus | 126 | | |
| 9 | Hydro | ven | 68 | Esuri | cyl | 127 | Oxych | dr |
| 10 | | ulv | 69 | | ang | 128 | | |
| 11 | Pseud | con | 70 | Abida | sec | 129 | | |
| 12 | Potam | jen | 71 | | | 130 | | h |
| 13 | Bythi | sch | 72 | | lam | 131 | Retin | ra |
| 14 | Biithy | ten | 73 | | | 132 | | |
| 15 | | lea | 74 | | pul | 133 | | |
| 16 | Assim | gra | 75 | | exc | 134 | Zonit | ca |
| 17 | Caryp | min | 76 | Ena | mon | 135 | | |
| 17a | min | agr | 77 | | | 136 | Vari | |
| 18 | | | 78 | Marpe | lam | 137 | | |
| 19 | Phyti | myo | 79 | | | 138 | | |
| 20 | Lymna | tru | 80 | | dub | 139 | Milax | gr |
| 21 | | gla | 81 | | rol | 140 | | |
| 22 | | pal | 82 | Lacin | bip | 141 | | so |
| 23 | | sia | 83 | Halea | per | 142 | | bu |
| 24 | | aur | 84 | | | 143 | Lintaa | te |
| 25 | | per | 85 | Testa | mau | 144 | | ma |
| 26 | | glu | 86 | | hal | 145 | | ci |
| 27 | Aplex | hyp | 87 | | scu | 146 | | fi |
| 28 | Phae | lon | 88 | Fruti | fru | 147 | Lehma | ma |
| 29 | | app | 89 | Helic | obv | 148 | Agrio | ag |
| 30 | Plano | cav | 90 | Helic | lap | 148a | agr | os |
| 31 | Menet | dil | 91 | Arian | arb | 149 | | |
| 32 | Plano | car | 92 | Theba | pis | 150 | | ca |
| 33 | | pla | 93 | | | 151 | | la |
| 34 | | vortic | 94 | | nem | 152 | Marga | me |
| 35 | | | 95 | | asp | 153 | Unio | pa |
| 36 | | leu | 96 | | pom | 154 | | ter |
| 37 | | lac | 97 | Hygro | lim | 155 | Anodo | cy |
| 38 | | alb | 98 | | cin | 156 | | an |
| 39 | | acr | 99 | | subr | 157 | | mi |
| 40 | | cri | 100 | | | 158 | Sphae | ra |
| 41 | | | 101 | | | 159 | | ca |
| 42 | Segne | com | 102 | | | 160 | | ti |
| 43 | | nit | 103 | | subv | 161 | | li |
| 44 | Acrol | lac | 104 | Monac | gra | 162 | Pixid | ani |
| 45 | Ancyl | flu | 105 | | car | 163 | | co |
| 46 | Catin | are | 106 | | | 164 | | pe |
| 47 | Succi | ohi | 107 | Helic | cap | 165 | | ob |
| 48 | | | 108 | | RIG | 166 | | mi |
| 49 | | pie | 109 | | | 167 | | pa |
| 50 | | ele | 110 | | neg | 168 | | su |
| 51 | Ateca | gno | 111 | | ita | 169 | | su |
| 52 | | | 112 | | ele | 170 | | he |
| 52a | lub | agr | 113 | Cochl | acu | 171 | | li |
| 53 | lutricella | | 114 | | | 172 | | li |
| 54 | Pyran | sup | 115 | Discu | rot | 173 | | hu |
| 55 | Colum | ede | 116 | Gemma | mac | 174 | | ni |
| 56 | Trunc | cyl | 117 | | | 175 | | pu |
| 57 | | bri | 118 | | | 176 | | te |
| 58 | Verti | pus | 119 | | | 177 | | te |
| 59 | | ant | 120 | | sub | 178 | Dreht | pa |

1) GASTROPODA.

Potamopyrgus jenkinsi (c. 1965 - Trotman) (R. Buckle, 1980).

Carychium minimum (8/68 - Kerney) (10/1/77 - T. James).

Carychium tridentatum (8/68 - Kerney) (17/8/80 - R. Buckle).

Physa fontinalis (8/68 - Kerney) (c. 1965 - A. Trotman).

Planorbis (Anisus) vortex (8/68 - Kerney).

Bathyomphalus contortus (8/68 - Kerney).

Succinea putrescens (8/68 - Kerney).

Cochlicopa lubrica (8/68 - Kerney) (24/2/78 - T.J.).

Lauria cylindracea (8/68 - Kerney).

Acanthinula aculeata (8/68 - Kerney).

Vallonia costata (8/68 - Kerney).

Eua obscura (8/68 - Kerney).

Clausilia bidentata (8/68 - Kerney).

Cecilioides acicula (8/68 - Kerney).

2)

GASTROPODA.

~~Helix~~ (Cepaea) hortensis (8/68 - Kenney)

(~~Hygromma~~ ^{Trichia}) striolata (8/68 - Kenney).

Trichia libesta (8/68 - Kenney).

Monacha cantiana (8/68 - Kenney) (1980 - P. Buckle)

Cermea virgata (8/68 - Kenney).

Punctum pygmaeum (8/68 - Kenney).

Arion intermedius (8/68 - Kenney).

Arion circumscriptus (8/68 - Kenney).

Arion hortensis (8/68 - Kenney).

Arion ater (agg). (8/68 - Kenney).

Euconulus fulvus (8/68 Kenney).

Vitreia contracta (8/68 Kenney).

Oxychilus cellarius (8/68 Kenney)

3) GASTROPODA.

Oxychilus allianus (8/68 - Kerney).

Aegopinella pura (8/68 - Kerney).

Aegopinella nitidula (8/68 - Kerney).

Vitrea pellucida (8/68 - Kerney).

~~*Agriolimax*~~ ^{*Deroceras*} *reticulatum* (8/68 - Kerney).

Ancylus fluviatilis (- few c. 1965. A. Trotman)

Lymnaea peregra. - frequent c. 1965. (Trotman). (common 23/3/80. T. J.)

Lymnaea palustris (c. 1965 - Trotman).

Arianta arbustorum (1977 - old shells).
(1: alive, 24/2/80 - T. J.).

Valvata cristata (old shells, on Common, 1978 - T. J.).

Lymnaea truncatula (old shells on Common, 1978 - T. J.).

Anisus leucostoma (old shells - 1978 - T. J., det. B. Rands).

Armiger crista (in River (163303), 17/2/80 - R. Buckle).

Oxyloma pfeifferi (old shells, 1978. - T. J. det. B. Rands).

4) GASTROPODA.

Vertigo pygmaea, (old shells in peat - 1978 - T. James).

Vallonia excentrica (old shells 24/2/78 - T.J.)

Nesovitrca hammonis (old shell 1978 - T.J.)

Cepaea nemoralis (1978 - T. James)

5) BIVALVES.

Pisidium personatum (old shells from peat, 24/2/78. - T. James.
det. M.P. Kerney).

PLATYHELMINTHES : TURBELLARIA.

Polycelis felina : very abundant - 1965. A. Trotman.
1964 (Ball).

Polycelis nigra : occasional - 1965. A. Trotman.
1964 (Ball).

Dendrocoelum lacteum : ^{in sandy tributary} on metal scrap. - 1965. A. Trotman.

Polycelis tenuis : 1964 (Ball).

Cerobbia alpina : 1964 (Ball) : ~~spring~~

ANNELLIDA : LUMBRICULIDAE.

Lumbriculus ^{variegatus} ~~sp.~~ c1965. A. Trotman.

ANNELLIDA : GLOSSIPHONIDAE.

Glossiphonia complanata : frequent c1965. A. Trotman.

Helobdella stagnalis : c1965. - ^{sandy} tributary A. Trotman.

ANNELIDA: HERPOBDELLIDAE

Herpobdella octoculata : frequent - 1965 A. Trotman

ANNELIDA: RHYNCHOBDELLIDAE

PISCIOLOIDAE

Pisciola geometra : frequent in metal in river - c 1965. A. Trotman.

SPONGILLIDAE

Ephydatia (*Spongilla*) *fluvialis*. c.1965. A. Trotman.
(prob. same species on dead wood. 23/3/1980 T.T.).

ROTIFERA.

Philodina spp. c.1965. A. Trotman.

HYDROZOA.

Hydra viridissima : sandy tributary (abundant) c1965 A. Trotman.

H. vulgaris : sandy tributary (abundant) c1965 A. Trotman.



11/001

TEL.: HEMEL HEMPSTEAD 50404

14. ROUGHDOWN ROAD,
BOXMOOR,
HERTS.,
HP3 9BJ

24th August 1980.

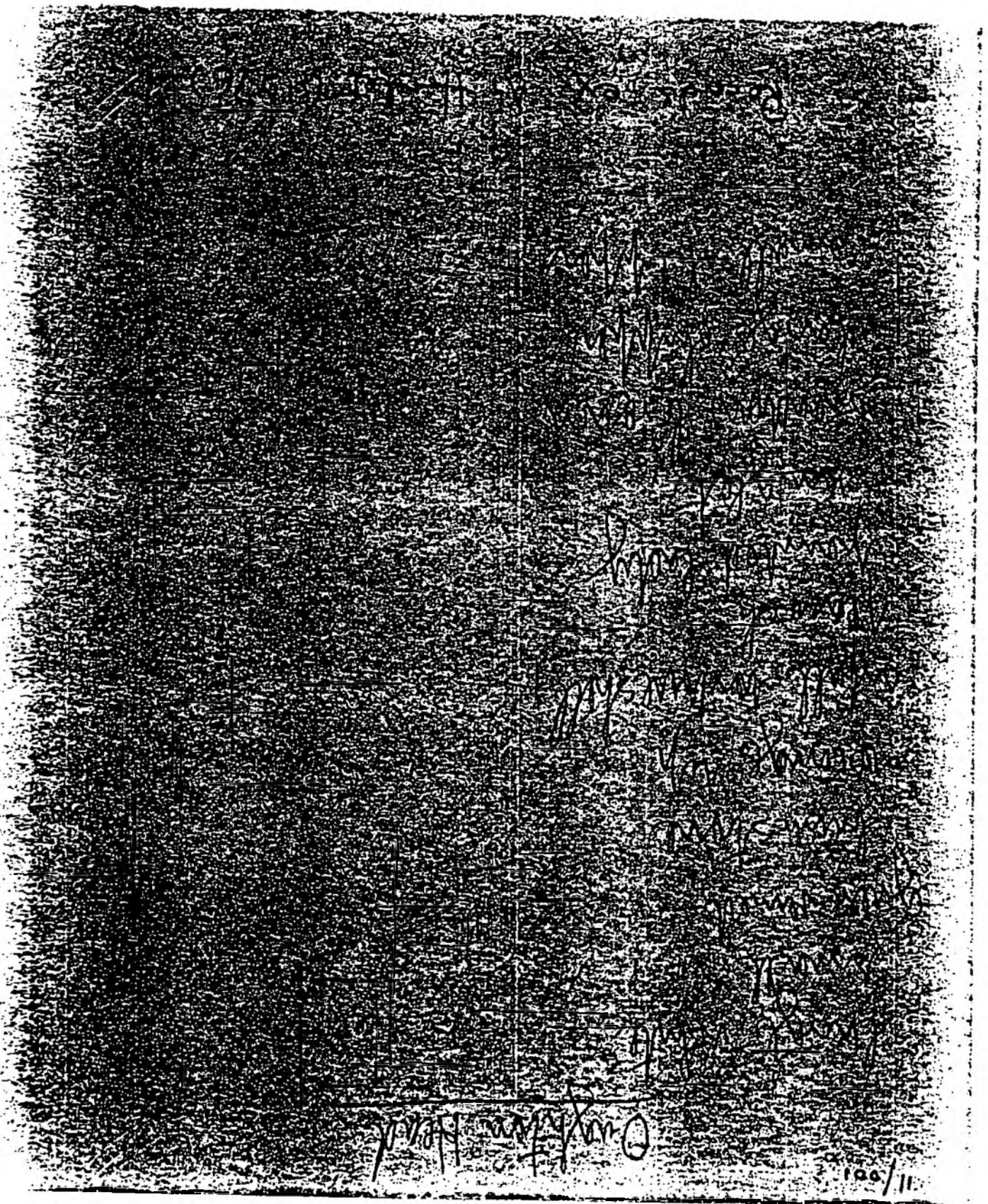
Dear Mr. James,

As I promised, here is
a list of the Molluscs I
found at Aughton Head Common
on 17th August 1980.

Potamopyrgus jenkinsii
Caryacium tridentatum
Planorbis cristata
Cochlicopa lubrica
Monacha cantiana

The mottled pink snail
which gyrovates its shell is, I
believe, a variety of *Monacha*
cantiana. I am attempting to keep
it alive, for the moment.

Yours sincerely
Roger Beckett.



| | | | | | | | | | | | |
|------|-------------|------------|------|--------------|-------------|------|--------------|-----------------|------|--------------|---------------|
| 864 | Eupithecia | vulgata | 1044 | Leucania | conigera | 1238 | Orthosia | advena | 1405 | Rusina | ferruginea |
| 868 | Euplexia | luci | 1046 | | impura | 1239 | | cruda | 1406 | Saturnia | pavonia |
| 871 | Euproctis | similis | 1048 | | litoralis | 1240 | | gothica | 1410 | Schrankia | costae |
| 873 | Eupulbia | trans | 1050 | | lythargyria | 1241 | | gracilis | 1411 | | taenialis |
| 875 | Eurois | occulta | 1052 | | pallens | 1242 | | incerta | 1415 | Scoliopteryx | lib |
| 877 | Euschis | comes | 1053 | | podorina | 1243 | | miniosa | 1417 | Scopula | conjugata |
| 878 | | intersecta | 1063 | Leucoma | salicis | 1244 | | munda | 1419 | | imitaria |
| 879 | | jambina | 1065 | | adusta | 1246 | | stabilis | 1421 | | impunctata |
| 880 | | orbosa | 1068 | Lithacodia | fas | 1248 | Ourapteryx | sam | 1422 | | lucata |
| 883 | Eustroma | retic | 1070 | Lithina | chloros | 1260 | Panemeria | teneb | 1424 | | ornata |
| 886 | Eumrotia | uncula | 1072 | Lithomoia | solid | 1262 | Panolis | flammea | 1426 | | ternata |
| 888 | Eusoa | cursoria | 1082 | Lithosia | com | 1266 | Paradiarsia | glar | 1431 | Selenis | bilunaria |
| 889 | | nigricans | 1084 | | griseola | 1270 | Parasemia | plani | 1432 | | lunaria |
| 891 | | tritici | 1085 | | lurideola | 1278 | Pelurga | comitata | 1438 | Semiothisa | litur |
| 897 | Gastropacha | quer | 1094 | Lobophora | hali | 1280 | Perconia | sirigi | 1441 | Sesia | apiformis |
| 899 | Geometra | papil | 1096 | Lomaspila | marg | 1282 | Peridroma | porph | 1447 | Smernithus | ocell |
| 906 | Gonodontis | bid | 1098 | Lophopteryx | cap | 1288 | Perizoma | affin | 1455 | Sphacia | bembeci |
| 909 | Gortyna | micacea | 1106 | Luperina | testa | 1289 | | albulata | 1457 | Sphinx | ligustri |
| 916 | Graphophora | aug | 1108 | Lyca | hirtaria | 1290 | | alchemillata | 1459 | Spilosoma | lubric |
| 918 | Gripoptera | april | 1110 | Lycophotia | varia | 1291 | | bifasciata | 1460 | | lutea |
| 920 | Gymnoscelis | pum | 1113 | Lycophaea | pus | 1292 | | blaudata | 1463 | Stauropus | fagi |
| 922 | Gypsitis | leucog | 1115 | Lygris | mellin | 1293 | | flavofasciata | 1465 | Sterrhia | aversata |
| 924 | Habrosyne | pyrit | 1116 | | populata | 1294 | | minorata | 1466 | | bisclata |
| 926 | Hada | nana | 1117 | | prunata | 1298 | Pesilampa | minim | 1470 | | dimidiata |
| 930 | Hadena | bicolor | 1118 | | pyralata | 1300 | Phalera | buceph | 1472 | | emarginata |
| 931 | | bicurrus | 1119 | | testata | 1302 | Phosia | gnoma | 1476 | | interpectaria |
| 939 | | lepidia | 1122 | Lymantria | mon | 1303 | | tremula | 1482 | | stramonata |
| 940 | | rivularis | 1124 | Lyncomeira | ocel | 1304 | Phigalia | pilos | 1483 | | subseri |
| 941 | | susua | 1130 | Macrothyl | rubi | 1306 | Philereme | trans | 1488 | Stilbia | anomala |
| 942 | | thalassina | 1133 | Malacosoma | neus | 1307 | | verulata | 1509 | Tetiza | duplaria |
| 948 | Harpyia | bifida | 1135 | Mamestra | brass | 1309 | Philodoria | potat | 1512 | | or |
| 949 | | furcula | 1139 | Melanchra | persi | 1311 | Philogophora | met | 1516 | Thalophila | mai |
| 959 | Heliothis | viri | 1141 | Melantheria | proc | 1317 | Phragmatobia | ful | 1518 | Thera | cognata |
| 961 | Hemaris | fuciflor | 1145 | Menophra | abrupt | 1319 | Phytometra | vind | 1519 | | firmata |
| 962 | | hyrus | 1147 | Meristis | irig | 1321 | Plagiodis | dolab | 1521 | | obeliscata |
| 964 | Hemisotia | immac | 1151 | Mesoseucia | albic | 1323 | Plemyria | rubigin | 1522 | | variata |
| 966 | Hemithea | aestiv | 1153 | Mesotype | virgata | 1329 | Plusia | chrysis | 1523 | Thanaos | rubicap |
| 968 | Hepialus | fuciflor | 1155 | Mitochristi | min | 1330 | | chrysoo | 1528 | Tholera | cespitis |
| 969 | | hecta | 1157 | Mimas | tiliae | 1332 | | festucae | 1529 | | popularis |
| 970 | | humuli | 1165 | Mormo | maura | 1334 | | gemma | 1533 | Thyatira | batis |
| 971 | | lupulina | 1167 | Mysticop | sexal | 1335 | | interrogationis | 1535 | Tiliacea | auraga |
| 972 | | sylvina | 1173 | Naenia | typica | 1339 | | jota | 1536 | | citraga |
| 974 | Hermippe | barbata | 1178 | Noctuia | pronuba | 1342 | | pulchrina | 1540 | Trichiura | crat |
| 984 | Horisme | tersata | 1181 | Nola | cuoulatella | 1346 | Poecilocampa | pop | 1542 | Trichopteryx | per |
| 985 | | vitalbata | 1189 | Nonagria | typhae | 1347 | Polia | hepatica | 1547 | Triphosa | dubit |
| 990 | Hydraecia | ogulea | 1191 | Noctodonta | drom | 1348 | | nebulosa | 1551 | Unca | trigemina |
| 991 | | paludis | 1193 | | trepida | 1352 | | nitens | 1552 | | triplesia |
| 993 | Hydretia | fum | 1195 | | ziczac | 1356 | Polyptoca | ridens | 1557 | Venusia | cambrica |
| 994 | | testaceata | 1197 | Nudaria | mundana | 1358 | Procris | statices | 1562 | Xanthorhoe | des |
| 998 | Hydriomena | coer | 1200 | Nyctolea | revay | 1359 | Procris | fasciun | 1563 | | ferrugata |
| 999 | | furcata | 1206 | Ochrop | plecta | 1360 | | furuncula | 1564 | | fluctuata |
| 1000 | | rubescens | 1208 | Odezia | citrata | 1361 | | latruncula | 1565 | | montana |
| 1006 | Hypena | probosci | 1212 | Omphalosc | lun | 1362 | | littorea | 1566 | | munata |
| 1007 | | rostralis | 1214 | Operophrata | bru | 1377 | | strigilis | 1568 | | spadicaria |
| 1018 | Irame | waureia | 1215 | | fagata | 1379 | Pseudopan | macul | 1570 | Xylena | exsoluta |
| 1020 | Jodia | croceaga | 1217 | Opisthograp | lut | 1383 | Pseudoterp | pruin | 1573 | Xylocampa | areola |
| 1022 | Jodia | lactearia | 1220 | Oponia | christ | 1388 | Picrosoma | pal | 1578 | Zanclognatha | sem |
| 1026 | Lampra | imbri | 1221 | | dilatata | 1392 | Pyrrhia | umbra | 1579 | | larispennalis |
| 1029 | Lampropter | luf | 1222 | Aligrammaria | | 1393 | Rheumaptera | cerv | 1581 | Zenobia | reusa |
| 1031 | Laethoe | populi | 1224 | Orygia | antiqua | 1395 | | hastaria | 1582 | | subrosea |
| 1035 | Larentia | clavaria | 1229 | Oriolitha | bipun | 1397 | | undulata | 1584 | Zeuzera | pyrina |
| 1037 | Lasiocampa | quer | 1230 | Chenopodiata | | 1401 | Rhizodra | luteola | 1588 | | impen |
| 1040 | Lasperryia | flex | 1234 | | plumbaria | 1403 | Rhyacia | simulans | 1589 | | lonceriae |
| 1043 | Leucama | comma | 1236 | Orthonama | lig | | Rivula | serice | 1591 | | trifolii |

OTHER SPECIES

- ADDITIONAL RECORD FROM N.C.C.'S INVENTORATE SITE REGISTRAR



TL 13101

Grid Ref.

52168304

HABITAT

Oughtonhead Common

Composite list

Date _____

V.C No.

| | |
|------|---------|
| Date | V.C No. |
| 1942 | 20 |

✓

V.C. Hestford

Ad

Code No.

BUTTERFLIES

| | | | | | | | |
|----|--------------------------|----|------------------|-----|------------------------|-----|--------------------|
| 7 | <i>Agathis</i> | 34 | <i>Colias</i> | 73 | <i>Maculinea</i> | 102 | <i>Plebeius</i> |
| 8 | <i>Amph. cardamines</i> | 36 | <i>Cupido</i> | 74 | <i>Mamotia</i> | 103 | <i>Polygona</i> |
| 9 | <i>Aptura</i> | 42 | <i>Erebia</i> | 76 | | 104 | <i>Polyommatus</i> |
| 10 | <i>Aphant. hypotant.</i> | 43 | | 78 | <i>Melan</i> | 110 | <i>Pyrgus</i> |
| 11 | <i>Argynnis</i> | 46 | <i>Erynnis</i> | 80 | <i>Melitaea</i> | 112 | <i>Strymonidea</i> |
| 12 | <i>Argynnis</i> | 48 | <i>Eumenis</i> | 81 | | 113 | <i>U-album</i> |
| 13 | | 50 | <i>Euphyd.</i> | 84 | <i>Nymphalis</i> | 115 | <i>Thecla</i> |
| 14 | <i>euphydryx</i> | 54 | <i>Gonopet.</i> | 85 | <i>polychloros</i> | 116 | <i>betulae</i> |
| 15 | <i>paphia</i> | 56 | <i>Hamearis</i> | 88 | <i>Ochrodia</i> | 118 | <i>Thymel</i> |
| 16 | <i>selene</i> | 58 | <i>Hesperia</i> | 90 | <i>Papilio machaon</i> | 120 | <i>lincolni</i> |
| 17 | <i>Aricia</i> | 62 | <i>Leptidea</i> | 91 | <i>Panope</i> | 122 | <i>metasticta</i> |
| 18 | <i>agestis</i> | 64 | <i>Limenitis</i> | 94 | <i>megera</i> | 123 | <i>reducta</i> |
| 19 | <i>Callophrys</i> | 68 | <i>Lysander</i> | 98 | <i>Papa</i> | | |
| 20 | <i>rubri</i> | 70 | <i>Lysan</i> | 100 | | | |
| 21 | <i>Carter palaeon</i> | | | | | | |
| 22 | <i>caesus</i> | | | | | | |
| 23 | <i>cyathus</i> | | | | | | |
| 24 | <i>Coenonymphus</i> | | | | | | |
| 25 | <i>lulita</i> | | | | | | |

MOTHS

| | | | | | | | | | | | |
|-----|-------------|---------------|-----|-----------------|--------------|-----|-----------------|---------------|-----|-------------|---------------|
| 101 | Abraeus | grossus | 427 | Apatele | aceris | 606 | Closteria | pigra | 750 | Ectypa | glyptica |
| 103 | | sylvata | 433 | megacanthephala | | 614 | Colocassa | coryli | 752 | Elleptroph | coryli |
| 105 | Acastus | viretata | 434 | menyanthidius | | 616 | Colostygia | didy | 754 | Elleptroph | fasciaria |
| 109 | Achlya | flavicornis | 435 | | psi | 617 | multistringaria | | 756 | Ematurga | atomar |
| 112 | Acootia | luctuosa | 436 | | rumicis | 618 | | olivata | 766 | Ennomos | quercin |
| 124 | Aegeria | culicis | 439 | Apoera | syringaria | 619 | | pectinataria | 768 | Enosiphia | caesi |
| 128 | | myopaeiformis | 443 | Apocheima | hispis | 620 | | salicata | 777 | Epione | repandari |
| 131 | | tipuliformis | 449 | Aporophyla | lutea | 622 | Colotox | pennari | 781 | Epirrhoe | alter |
| 134 | Aethalura | puncta | 450 | | nigra | 626 | Combabaena | pust | 781 | | galatiae |
| 136 | Agrochola | circ | 453 | Archicaris | par | 629 | Conasira | ligula | 782 | | tristata |
| 137 | | lota | 453 | | caja | 630 | | vaccini | 783 | | caerul |
| 138 | | lychnidius | 456 | | villicata | 636 | Cosmua | diffinis | 785 | Episema | auran |
| 139 | | macilenta | 461 | Arenostola | elymi | 638 | | trapezina | 787 | Erannis | defloraria |
| 141 | Agrotis | clavus | 465 | | phragmitidis | 640 | Cossus | cossus | 788 | | leucophaea |
| 143 | | denticulatus | 466 | | pygmina | 644 | Cosymbia | albi | 789 | | marginalia |
| 144 | | exclamationis | 468 | Asphalia | dilusa | 645 | | annulata | 790 | | ochrole |
| 146 | | ipilon | 473 | Asithena | albula | 646 | | linearia | 792 | Eremobia | ochrole |
| 147 | | puta | 475 | Aethmia | seramp | 648 | | porata | 794 | Eriogaster | lan |
| 148 | | ripae | 477 | Aiolmis | rubri | 649 | | punctaria | 802 | Euclocha | nebul |
| 149 | | segetum | 479 | Ayilia | putris | 652 | Craniophora | lig | 806 | Euclidimera | mi |
| 152 | | vestigialis | 483 | Dapia | bimaculata | 654 | Crocallis | eling | 808 | Eugnoris | dep |
| 156 | Aicis | repandata | 485 | | temerata | 660 | Cryphia | perla | 810 | Eumichis | adus |
| 158 | Allophyes | otycac | 487 | Bena | fagana | 666 | Cucullis | chamom | 814 | Euphyia | bulin |
| 160 | Allophyla | aes | 489 | Biston | betularia | 671 | | umbratica | 815 | | cuculata |
| 162 | Amelthes | agathione | 490 | | strataria | 672 | | verbasci | 817 | | piceata |
| 163 | | alpicola | 494 | Bombycia | vimin | 674 | Cybosia | mesomel | 819 | | rubidata |
| 165 | | baja | 501 | Brachion | sphinx | 676 | Cynia | mendica | 819 | | unangulata |
| 167 | | castanea | 505 | Bupalus | pinaria | 682 | Casychnura | fas | 821 | Eupithecia | abb |
| 168 | | c-nigrum | 509 | Callimorpha | iac | 683 | | pudibunda | 822 | | absintharia |
| 169 | | diatruxemum | 517 | Calothysan | amat | 687 | Deilephila | elp | 824 | | assimilata |
| 170 | | sestrigata | 519 | Campaea | margar | 688 | | porcellus | 825 | | castigata |
| 171 | | stigmatica | 523 | Caradrina | alun | 692 | Deiluzia | exanth | 826 | | centaureata |
| 172 | | triangulum | 525 | | blanda | 693 | | pustaria | 828 | | disruptaria |
| 173 | | zeanthographa | 526 | | clavipalpis | 695 | Deuseronon | ain | 829 | | dodoneata |
| 175 | Amnigrotis | luc | 527 | | morpheus | 696 | | erosaria | 830 | | exiguata |
| 177 | Ampibipyr | pyram | 530 | Carsia | sororitaria | 697 | | fuscantaria | 832 | | goossensata |
| 178 | | tragopogonis | 536 | Catocala | eupta | 699 | Diactria | san | 833 | | haworthiata |
| 180 | Anagoga | pulver | 540 | Celadonia | haworthi | 701 | | brunnea | 834 | | icterata |
| 182 | Anatius | edorm | 541 | | leucostigma | 701 | | dahlia | 835 | | indigata |
| 183 | | plagiata | 543 | Celama | confusum | 705 | | mendica | 836 | | inopata |
| 185 | Anaplect | prasinaria | 545 | Ceramica | psia | 706 | | rubi | 838 | | intricata |
| 189 | Anarta | myrtilli | 559 | Cerapteryx | gram | 709 | Diastria | oler | 839 | | inturbata |
| 191 | Anchoscelis | bel | 561 | Cerastis | rubric | 713 | Diplosiphia | scop | 841 | | laricaria |
| 192 | | litura | 563 | Cerura | vinula | 719 | Drepnea | binaria | 842 | | linearia |
| 196 | Angerona | prunaria | 565 | | rufofcor | 720 | | calcaria | 844 | | nanata |
| 198 | Anticlea | deriv | 565 | Chaonia | legata | 721 | | falcitaria | 846 | | pimpinellata |
| 407 | Apamea | crenata | 571 | Chesias | rustica | 721 | | lucertinaria | 848 | | plumbeolata |
| 408 | | epomidion | 572 | | nide | 723 | | dodon | 849 | | pulchellus |
| 410 | | surva | 581 | Chloroclystus | maia | 725 | Drymonia | dodon | 850 | | pygmaea |
| 411 | | infesta | 582 | | luterata | 727 | Dryobolodes | ere | 851 | | salvata |
| 413 | | lithosylacea | 584 | Chloroclystus | cor | 729 | Dypterygia | scab | 851 | | sobrinata |
| 414 | | monoglypha | 585 | | debiliata | 733 | Dyscia | fagaria | 852 | | subnotata |
| 415 | | oblonga | 586 | | rectangulata | 735 | Dysytroma | citra | 853 | | subumbrata |
| 416 | ophiogramma | | 588 | Cidaria | fulvata | 737 | | truncata | 854 | | succenturiata |
| 418 | | remissa | 590 | Cilia | glaucaata | 739 | Earns | clorana | 855 | | tantillaria |
| 420 | | secalis | 592 | Citrhia | givaago | 741 | Earpophila | badia | 857 | | tenulata |
| 421 | | sorocens | 593 | | icteritia | 743 | Ecliptoptera | sil | 858 | | tripunctaria |
| 422 | | subulstris | 597 | Citria | lutea | 745 | Ectropis | biund | 859 | | valerianata |
| 423 | | unanimis | 600 | Cleora | rhomboid | 746 | | consonaria | 861 | | venosata |
| 424 | | versillon | 602 | Cleorodes | lich | 747 | | crepuscularia | 862 | | virgaureata |
| | | | | | | 748 | | extersaria | 863 | | |

Engleken Head
Hitchin
Habitat

TL 1630

Various, from 22nd May 1982
to 2nd July 1983.

Woodland
Few wet areas
Records: D.R. Nellist.

Family ATYPIDAE
Atypus affinis Eichwald

Family EREPIDAE
Erebus niger (Petagna)

Family AMAROBIDAE
Amarobius fenestralis (Stroem)
Amarobius similis (Blackwall)
Amarobius teres (Walckenaer)

Family DICTYNIDAE
Dictyna arundinacea (Linnaeus)
Dictyna pusilla Thorell
Dictyna major Menge
Dictyna uncinata Thorell
Dictyna latens (Fabricius)
Heterodictyna puella (Simon)
Heterodictyna flavescens (Walckenaer)
Heterodictyna walckenaeri Roewer
Lathys humilis (Blackwall)
Lathys stigmatisata (Menge)
Argenna subnigra (O. P.-Cambridge)
Argenna patula (Simon)
Atella lucida (Simon)

Family ULONIDAE
Uloborus walckenaerius Latreille
Hyptiotes paradoxus (C. L. Koch)

Family OONOPIDAE
Oonops pulcher Templeton
Oonops domesticus de Dalmas

Family DYSDERIDAE
Dysdera erythrina (Walckenaer)
Dysdera crocata C. L. Koch
Harpactea hombergi (Scopoli)
Segestria semiculata (Linnaeus)
Segestria barbara C. L. Koch
Segestria florentina (Risso)

Family SCYTODIDAE
Scytodes thoracica Latreille

Family PHIDIPIDAE
Phidippus phalangoides (Fuesslin)
Psilochorus simoni (Berland)

Family GNAPHOSIDAE
Drassodes lapidosus (Walckenaer)
Drassodes cupreus (Blackwall)
Drassodes pubescens (Thorell)
Haplodrassus signatus (C. L. Koch)
Haplodrassus dalmanensis (L. Koch)
Haplodrassus silvestris (Blackwall)
Haplodrassus minor (O. P.-Cambridge)
Haplodrassus soerenseni (Strand)
Haplodrassus umbratilis (L. Koch)
Herpyllus blackwalli (Thorell)
Phaeocedus bruceatus (L. Koch)
Zelotes pedestris (C. L. Koch)
Zelotes lateralis (L. Koch)
Zelotes pusillus (C. L. Koch)
Zelotes rusticus (L. Koch)
Zelotes praecox (L. Koch)
Zelotes electus (C. L. Koch)
Zelotes latreillei (Simon)
Zelotes apricorum (L. Koch)
Zelotes serotinus (L. Koch)
Zelotes petrensis (C. L. Koch)
Gnaphosa lugubris (C. L. Koch)
Gnaphosa occidentalis Simon
Gnaphosa leporina (L. Koch)
Callilepis nocturna (Linnaeus)
Micaria pulicaria (Sundevall)
Micaria semitillans (O. P.-Cambridge)
Micaria alpina L. Koch
Micaria subopaca Westring
Micaria silesiaca L. Koch

Family CLUBIONIDAE
Clubiona corticalis (Walckenaer)
Clubiona reclusa O. P.-Cambridge
Clubiona subsultans Thorell
Clubiona signatilis Kulczynski
Clubiona rosserae Locket
Clubiona norvegica Strand
Clubiona coerulea L. Koch
Clubiona pallidula (Clerck)
Clubiona phraemitis C. L. Koch
Clubiona terrestris Westring
Clubiona neglecta O. P.-Cambridge
Clubiona similis L. Koch
Clubiona lutescens Westring
Clubiona compia C. L. Koch
Clubiona brevipes Blackwall
Clubiona trivialis C. L. Koch
Clubiona juvenis Simon
Clubiona genevensis L. Koch
Clubiona diversa O. P.-Cambridge
Clubiona subulis L. Koch
Caecidantennium erratum (Walckenaer)
Caecidantennium peniti (O. P.-Cambridge)
Caecidantennium strepens (Strand)

Family CLUBIONIDAE (cont.)
Agroeca brunnea (Blackwall)
Agroeca proxima (O. P.-Cambridge)
Agroeca mopina (O. P.-Cambridge)
Agroeca lusitica (L. Koch)
Agroeca cuprea Menge
Agracina striata (Kulczynski)
Scotina celans (Blackwall)
Scotina gracilipes (Blackwall)
Scotina pallardi (L. Koch)
Liocranum rupicola (Walckenaer)
Phrurolithus testivus (C. L. Koch)
Phrurolithus minimus C. L. Koch

Family ZORIDAE
Zora spinimana (Sundevall)
Zora ornata Simon
Zora nemoralis (Blackwall)
Zora silvestris Kulczynski

Family ANYPHAENIDAE
Anyphaena accentuata (Walckenaer)

Family SPARASSIDAE
Micrommata virens (Clerck)

Family THOMISIDAE
Thomisus onustus Walckenaer
Diaea dorsata (Fabricius)
Misumena vatia (Clerck)
Pistius truncatus (Pallas)
Xysticus cristatus (Clerck)
Xysticus audax (Schränk)
Xysticus kochi Thorell
Xysticus erraticus (Blackwall)
Xysticus lanius C. L. Koch
Xysticus ulmi (Hahn)
Xysticus bifasciatus C. L. Koch
Xysticus luctator L. Koch
Xysticus sabulosus (Hahn)
Xysticus luctuosus (Blackwall)
Xysticus acerbus Thorell
Xysticus robustus (Hahn)
Oxyptila blackwalli Simon
Oxyptila scabricula (Westring)
Oxyptila nigrita (Thorell)
Oxyptila sanctuaria (O. P.-Cambridge)
Oxyptila praticola (C. L. Koch)
Oxyptila trux (Blackwall)
Oxyptila simplex (O. P.-Cambridge)
Oxyptila atomaria (Panzer)
Oxyptila brevis (Hahn)
Philodromus dispar Walckenaer
Philodromus aureolus (Clerck)
Philodromus praedatus (O. P.-Cambridge)
Philodromus cespium (Walckenaer)

Philodromus bovi Simon
Philodromus collinus C. L. Koch
Philodromus talus Sundevall
Philodromus noster (Latreille)
Philodromus cambridgei (S. Frank)

Family THOMISIDAE (cont.)
Philodromus rufus Walckenaer
Philodromus margaritatus (Clerck)
Thanatus striatus C. L. Koch
Thanatus formicinus (Clerck)
Tibellus maritimus (Menge)
Tibellus oblongus (Walckenaer)

Family SALTICIDAE
Salicinus scenicus (Clerck)
Salicinus cinerellus (Panzer)
Salicinus zebraeus (C. L. Koch)
Salicinus mutabilis Lucas
Helophanus cupreus (Walckenaer)
Helophanus flavipes C. L. Koch
Helophanus melinus L. Koch
Helophanus auratus C. L. Koch
Marpissa muscosa (Clerck)
Marpissa pomatia (Walckenaer)
Bianor aeneus (Simon)
Hycia nivosi (Lucas)
Ballus depressus (Walckenaer)
Neon reticulatus (Blackwall)
Neon valentini Falconer
Euophrys frontalis (Walckenaer)
Euophrys herbergeri (Simon)
Euophrys petrensis C. L. Koch
Euophrys erraticus (Walckenaer)
Euophrys aequipes (O. P.-Cambridge)
Euophrys lanigera (Simon)
Euophrys browni Millidge and Locket
Sitticus pubescens (Fabricius)
Sitticus caricis (Westring)
Sitticus floricola (C. L. Koch)
Sitticus rupicola (C. L. Koch)
Attilus saltator (Simon)
Evarcha falcata (Clerck)
Evarcha arcuata (Clerck)
Aelurillus v-insignitus (Clerck)
Phlegra fasciata (Hahn)
Synageles venator (Lucas)
Myrmarachne formicaria (Degeer)
Pellenes tripunctatus (Walckenaer)

Family OXYOPIDAE
Oxyopes heterophthalmus Latreille

Family LYCOSIDAE
Pardosa agricola (Thorell)
Pardosa agricola forma arenicola (O. P.-Cambridge)
Pardosa aerealis (Westring)
Pardosa purbeckensis F. O. P.-Cambridge
Pardosa monticola (Clerck)
Pardosa palustris (Linnaeus)

Pardosa pullata (Clerck)
Pardosa pratensis (L. Koch) ? *Lyceus*
Pardosa amentata (Clerck)
Pardosa merensis (Thorell)
Pardosa lucorum (Walckenaer)

Family LYCOSIDAE (cont.)
Pardosa hortensis (Thorell)
Pardosa proxima (C. L. Koch)
Pardosa trauili (O. P.-Cambridge)
Pardosa paludicola (Clerck)
Hygrolycosa rubrofasciata (Ohlert)
Aerolycosa nemoralis (Westring)
Aerolycosa minuta (C. L. Koch)
Alopecusa pulverulenta (Clerck)
Alopecusa cuneata (Clerck)
Alopecusa accentuata (Latreille)
Alopecusa labialis (Clerck)
Trochosa ruficollis (Degeer)
Trochosa robusta (Simon)
Trochosa terricola Thorell
Trochosa spinipalpis (F. O. P.-Cambridge)
Arctosa fulvicollis (Lucas)
Arctosa perita (Latreille)
Arctosa leopardus (Sundevall)
Arctosa cinerea (Fabricius)
Tricra alpigena (Dolleschall)
Pirata piraticus (Clerck)
Pirata hygrophilus Thorell
Pirata latrans (Blackwall)
Pirata piscatorius (Clerck)
Pirata uliginosus (Thorell)
Aulonia albimana (Walckenaer)

Family PISAURIDAE
Pisaura mirabilis (Clerck)
Dolomedes humbratus (Clerck)
Dolomedes plantarius (Clerck)

Family AGELENIDAE
Ageleneta aquatica (Clerck)
Agelena labryinthica (Clerck)
Tetraria denticulata (Olivier)
Tegenaria aenea Blackwall
Tegenaria atrica C. L. Koch
Tegenaria parietina (Fourcroy)
Tegenaria agrestis (Walckenaer)
Tegenaria domestica (Clerck)
Tegenaria silvestris L. Koch
Coelotes atropos (Walckenaer)
Coelotes terrestris (Wider)
Cicurina cicur (Fabricius)
Cryphoeca silvicola (C. L. Koch)
Tetrilus macrophthalmus (Kulczynski)
Tetrilus arietinus (Thorell)
Tuberia merensis (O. P.-Cambridge)
Antistea elegans (Blackwall)
Hahnina montana (Blackwall)
Hahnina candida Simon
Hahnina nava (Blackwall)
Hahnina helvola Simon
Hahnina pusilla C. L. Koch

Family MIMIDIDAE
Eri cambridgei Kulczynski
Eri tucata (Wider)
Eri tucata (Degeer)

Family TETRAGNATHIDAE

Epismus angulatus (Blackwall)
Epismus truncatus Latreille
Epismus maculipes Cuvanna
Eurypis flavomaculata (C. L. Koch)
Diploena erythropus (Simon)
Diploena prima (Menge)
Diploena mornata (O. P.-Cambridge)
Diploena tristis (Hahn)
Diploena coracina (C. L. Koch)
Diploena melanogaster (C. L. Koch)
Diploena torva (Thorell)
Crustulina cistata (Wider)
Crustulina stricta (O. P.-Cambridge)
Steatoda phalerata (Panzer)
Steatoda albomaculata (Degeer)
Steatoda bipunctata (Linnaeus)
Steatoda grossa (C. L. Koch)
Inclusimus vittatus (C. L. Koch)
Inclusimus pulchellus (Walckenaer)
Inclusimus aulicus (C. L. Koch)
Achaearanea lunata (Clerck)
Achaearanea riparia (Blackwall)
Achaearanea tepidariorum (C. L. Koch)
Achaearanea similans (Thorell)
Achaearanea versiculata (Urquhart)
Theridion sisypium (Clerck)
Theridion impressum L. Koch
Theridion pictum (Walckenaer)
Theridion simile C. L. Koch
Theridion varians Hahn
Theridion melanurum Hahn
Theridion mystaceum L. Koch
Theridion familiare O. P.-Cambridge
Theridion blackwalli O. P.-Cambridge
Theridion tinctum (Walckenaer)
Theridion instabile O. P.-Cambridge
Theridion bellicosum Simon
Theridion himaculatum (Linnaeus)
Theridion pallens Blackwall
Enoplognatha ovata (Clerck)
Enoplognatha thoracica (Hahn)
Enoplognatha schaufussi (L. Koch)
Enoplognatha mandibularis (Lucas)
Robertus lividus (Blackwall)
Robertus arundineti (O. P.-Cambridge)
Robertus neglectus (O. P.-Cambridge)
Robertus scoticus Jackson
Robertus insignis O. P.-Cambridge
Pholcomma gibbum (Westring)
Phonoe minutissima (O. P.-Cambridge)

Family NESTIDAE

Nestius cellulanus (Clerck)

Family TETRAGNATHIDAE

Tetragnatha extensa (Linnaeus)
Tetragnatha pinnata L. Koch
Tetragnatha montana Simon
Tetragnatha obtusa C. L. Koch

Family TETRAGNATHIDAE (cont.)

Tetragnatha nigrita Lendl
Tetragnatha striata L. Koch
Pachygnatha clercki Sundevall
Pachygnatha listeri Sundevall
Pachygnatha degeeri Sundevall
Meta segmentata (Clerck)
Meta menneri (Blackwall)
Meta merianae (Scopoli)
Meta menardi (Latreille)
Meta bourneiti Simon

Family ARANEIDAE

Araneus bituberculatus (Walckenaer)
Araneus gibbosus (Walckenaer)
Araneus angulatus Clerck
Araneus diadematus Clerck
Araneus quadratus Clerck
Araneus nurmoreus Clerck
Araneus marmoreus pyramidalis Clerck
Araneus alpine (Walckenaer)
Araneus cornutus Clerck
Araneus scutiger Clerck
Araneus putagatus Clerck
Araneus ceropagus (Walckenaer)
Araneus umbraticus Clerck
Araneus redii (Scopoli)
Araneus adiutus (Walckenaer)
Araneus sturmi (Hahn)
Araneus triguttatus (Fabricius)
Araneus cucurbitinus Clerck
Araneus opistographus Kulczynski

Araneus inconspicuus (Simon)
Araneus alpinus (L. Koch)
Araneus dispartitus (Hentzi)
Zilla diodia (Walckenaer)
Hypsosinga albavittata (Westring)
Hypsosinga pygmaea (Sundevall)
Hypsosinga sanguinea (C. L. Koch)
Hypsosinga heri (Hahn)
Singa humata (Clerck)
Cercidia prominens (Westring)
Zygiella x-notata (Clerck)
Zygiella atrica (C. L. Koch)
Zygiella striata (Thorell)
Mangora acalypha (Walckenaer)
Cyclosa conica (Pallas)
Argiope bruennichi (Scopoli)
Theridion gemmosum (L. Koch)

Family LINYPHIDAE

Ceratinella brevipes (Westring)
Ceratinella brevis (Wider)
Ceratinella scabra (O. P.-Cambridge)
Walckenaera acuminata Blackwall
Walckenaera mitrata (Menge)
Walckenaera antica (Wider)
Walckenaera cucullata (C. L. Koch)
Walckenaera nodosa (O. P.-Cambridge)

Family LINYPHIDAE (cont.)

Walckenaera melanoccephala
(O. P.-Cambridge)
Walckenaera capiti (Westring)
Walckenaera incisa (O. P.-Cambridge)

Walckenaera dyseroides (Wider)
Walckenaera stylitrons (O. P.-Cambridge)
Walckenaera nupulps (Westring)
Walckenaera obtusa Blackwall
Walckenaera monoceros (Wider)
Walckenaera cornutus
(O. P.-Cambridge)

Walckenaera fuscilata (Menge)
Walckenaera unicolor O. P.-Cambridge
Walckenaera kochi (O. P.-Cambridge)
Walckenaera clavicornis (Emerton)
Walckenaera cuspidata Blackwall
Walckenaera vigilax (Blackwall)
Dicymbium nigrum (Blackwall)
Dicymbium brevissimum Locket
Dicymbium tubile (Blackwall)
Entelecara acuminata (Wider)
Entelecara congenera (O. P.-Cambridge)
Entelecara erythropus (Westring)
Entelecara flavipes (Blackwall)
Entelecara omissa O. P.-Cambridge
Entelecara errata O. P.-Cambridge
Maehelia penicillata (Westring)
Erigonidium graminicola (Sundevall)
Gnathonarium dentatum (Wider)
Trematocephalus cristatus (Wider)
Tmetiscus affinis (Blackwall)

Gonyldium rufipes (Sundevall)
Dismodicus bifrons (Blackwall)
Dismodicus elevatus (C. L. Koch)
Hypomma bituberculatum (Wider)
Hypomma fulvum Bösenberg
Hypomma cornutum (Blackwall)
Metopobactrus prominulus
(O. P.-Cambridge)
Hydrocoptes decollatus (Simon)
Baryphyma pratensis (Blackwall)
Praestitia duffei Millidge
Acanthophyma gowerensis (Locket)
Gonatium rubens (Blackwall)
Gonatium rubellum (Blackwall)
Gonatium corallipes (O. P.-Cambridge)
Minyrioloides tritons (O. P.-Cambridge)
Minyrioloides maritimus
Crocker and Parker

Maso sualevalli (Westring)
Maso gallica Simon
Peponocranium ludicum
(O. P.-Cambridge)
Pocadicnemus pumila (Blackwall)
Hypselistes jacksoni (O. P.-Cambridge)
Hypselistes thorax (O. P.-Cambridge)
Oedothorax gibbosus (Blackwall)

Family LINYPHIDAE (cont.)

Oedothorax tuberosus (Blackwall)
Oedothorax fuscus (Blackwall)
Oedothorax agrestis (Blackwall)
Oedothorax retusus (Westring)
Oedothorax apicatus (Blackwall)
Trichopterna thorelli (Westring)
Trichopterna menneri (Simon)
Trichopterna cito (O. P.-Cambridge)
Pelecopus parallela (Wider)
Pelecopus nemoralis (Blackwall)
Pelecopus medietis (Kulczynski)
Pelecopus locketti Cooke
Pelecopus elongata (Wider)
Pelecopus radialis (L. Koch)
Silometopus elegans (O. P.-Cambridge)
Silometopus ambiguus (O. P.-Cambridge)

Silometopus reussi (Thorell)
Silometopus incurvatus
(O. P.-Cambridge)
Mecopsites paxi Wunderlich
Cephalotes obscurus (Blackwall)
Acartuarchus scutellus
(O. P.-Cambridge)
Trichoncus saxicola (O. P.-Cambridge)
Trichoncus hackmani Millidge
Trichoncus affinis Kulczynski
Ceratinopsis romana (O. P.-Cambridge)
Ceratinopsis statius (Simon)
Evansia merens O. P.-Cambridge
Tiso vagans (Blackwall)
Tiso aestivus (L. Koch)
Troxochrus scutellus (Westring)
Troxochrus curvifrons (O. P.-Cambridge)
Minyriolus pusillus (Wider)
Tapinocyba praecox (O. P.-Cambridge)
Tapinocyba pallens (O. P.-Cambridge)
Tapinocyba insecta (L. Koch)
Tapinocyba mitis (O. P.-Cambridge)
Tapinocyba pygmaea (Menge)

Aulacocyba subitanea (O. P.-Cambridge)
Perimones brutus (Jackson)
Thyreosthenus parasiticus (Westring)
Thyreosthenus hirsutus
(O. P.-Cambridge)
Monocephalus fuscipes (Blackwall)
Monocephalus castaneipes (Simon)
Caroria limnea (Crosby and Bishop)
Caroria pullosa Dufley
Lophomma punctatum (Blackwall)
Mio terna blanda (Simon)
Lesserticula saxetorum (Hull)
Salica diceros (O. P.-Cambridge)
Jackonella fulvipes (Jackson)
Wichlea calcarata (Simon)
Gonyldium vivum (O. P.-Cambridge)

Family LINYPHIDAE (cont.)

Gonyldium latericola
(O. P.-Cambridge)
Gonyldium muricatum Simon
Micrargus herbergeri (Blackwall)
Micrargus subaequalis (Westring)
Micrargus laudatus (O. P.-Cambridge)
Votioscopus sarcinatus
(O. P.-Cambridge)
Glyphestis cottonae (La Touche)
Glyphestis servus (Simon)
Erigoneila hiemalis (Blackwall)
Erigoneila ignobilis (O. P.-Cambridge)
Savignya frontata (Blackwall)
Diplocephalus cristatus (Blackwall)
Diplocephalus permixtus
(O. P.-Cambridge)
Diplocephalus latitrons
(O. P.-Cambridge)
Diplocephalus conatus Bertkau
Diplocephalus jacksoni (O. P.-Cambridge)
Diplocephalus paxius (Blackwall)
Diplocephalus protuberans
(O. P.-Cambridge)
Araoncus humilis (Blackwall)
Araoncus crassiceps (Westring)
Punumomops succitrons (Wider)
Lessertia dentichelis (Simon)
Asthenoreus pugnus (Simon)
Caledonia evansi O. P.-Cambridge
Typhochrestus digitatus (O. P.-Cambridge)
Typhochrestus simoni de Lessert
Collusia distincta (Simon)
Collusia holmeri (Thorell)
Milleriana inerrans (O. P.-Cambridge)
Diplocentria bidentata (Emerton)
Erigone denipalpis (Wider)
Erigone atra (Blackwall)
Erigone promiscua (O. P.-Cambridge)
Erigone arctica (White)
Erigone longipalpis (Sundevall)
Erigone tirolensis L. Koch
Erigone cupra Simon
Erigone welchi Jackson
Erigone vagans Audouin
Erigone psychrophila Thorell
Rhaebothorax morulus
(O. P.-Cambridge)
Rhaebothorax paetulus
(O. P.-Cambridge)
Ehoria fausta (O. P.-Cambridge)
Ehoria caliginosa Falconer
Donacochara speciosa (Thorell)
Leptorhoptrum robustum (Westring)
Drepanotylus uncinatus (O. P.-Cambridge)
Phaulothrix hardyi (Blackwall)
Hilura exilis (O. P.-Cambridge)
Hilura frigida (Thorell)
Hilura nubigena Hull

Psocoptera juncea

Family LINYPHIDAE (cont.):

- Halaria pervicax* Hull
- Halorates reprobus* (O. P.-Cambridge)
- Oscariius melanopygius*
(O. P.-Cambridge)
- Aphileta misera* (O. P.-Cambridge)
- Porrhomma pygmaeum* (Blackwall)
- Porrhomma convexum* (Westring)
- Porrhomma rosenhaueri* (L. Koch)
- Porrhomma pallidum* Jackson
- Porrhomma campbelli*
F. O. P.-Cambridge
- Porrhomma microphthalmum*
(O. P.-Cambridge)
- Porrhommus errans* (Blackwall)
- Porrhomma egeria* Simon
- Porrhomma oblitum* (O. P.-Cambridge)
- Porrhomma montanum* Jackson
- Svedra innotabilis* (O. P.-Cambridge)
- Svedra gracilis* (Menge)
- Aegneta subtilis* (O. P.-Cambridge)
- Aegneta conigera* (O. P.-Cambridge)
- Aegneta decora* (O. P.-Cambridge)
- Aegneta cauta* (O. P.-Cambridge)
- Aegneta rufosa* Jackson
- Meioneta rufestris* (C. L. Koch)
- Meioneta mollis* (O. P.-Cambridge)
- Meioneta simplicioris* (Simon)
- *Meioneta saxatilis* (Blackwall)
- Meioneta beata* (O. P.-Cambridge)
- Meioneta gulosa* (L. Koch)
- Meioneta nigripes* (Simon)
- Microneta viaria* (Blackwall)
- Maro minutus* O. P.-Cambridge
- Maro sublestus* Falconer
- Maro lepidus* Casimir
- Centromerus sylvaticus* (Blackwall)
- Centromerus expertus* (O. P.-Cambridge)
- Centromerus prudens* (O. P.-Cambridge)
- Centromerus arcunus* (O. P.-Cambridge)
- Centromerus laevitarsis* (Simon)
- Centromerus dilutus* (O. P.-Cambridge)
- Centromerus tantulus* Parker
- Centromerus capucinus* (Simon)
- Centromerus incilium* (L. Koch)
- Centromerus incultus* Falconer
- Centromerus aequalis* (Westring)
- Centromerus parkeri* Cooke
- Centromerus serratus* (O. P.-Cambridge)
- Centromerus albidus* Simon
- Centromerus cavernarum* (L. Koch)
- Centromerus persimilis*
(O. P.-Cambridge)
- Centromerita bicolor* (Blackwall)
- Centromerita concinna* (Thorell)
- Sintula cornigera* (Blackwall)
- *Oreometides abnormis* (Blackwall)
- Oreometides trimus* (O. P.-Cambridge)

Family LISYPHIDAE (cont.):

Orcanodes vaginatus (Thorell)

Maerargus rufus (Wider)

Maerargus carpenteri (O. P.-Cambridge)

Bathypantes approximatus

(O. P.-Cambridge)

● *Bathypantes gracilis* (Blackwall)

● *Bathypantes parvulus* (Westring)

● *Bathypantes nigrinus* (Westring)

Bathypantes setiger

F. O. P.-Cambridge

Kaestneria dorsalis (Wider)

● *Kaestneria pullata* (O. P.-Cambridge)

● *Diplostyla concolor* (Wider)

Procloneta globosa (Wider)

Drupetisca socialis (Sundevall)

Tapinopa longidens (Wider)

Floronua bucculenta (Clerck)

Taranucnus setosus (O. P.-Cambridge)

Labulla thoracica (Wider)

Stemonophantes lineatus (Linnaeus)

Bolyphantes luteolus (Blackwall)

Bolyphantes alticeps (Sundevall)

Lepthyphantes nebulosus (Sundevall)

Lepthyphantes leptopus (Ohlert)

Lepthyphantes minutus (Blackwall)

Lepthyphantes alucis (Blackwall)

Lepthyphantes whymperi

F. O. P.-Cambridge

Lepthyphantes obscurus (Blackwall)

● *Lepthyphantes tenuis* (Blackwall)

● *Lepthyphantes zimmermanni* Bertkau

Lepthyphantes cristatus (Menge)

Lepthyphantes mendei Kulczynski

Lepthyphantes flavipes (Blackwall)

Lepthyphantes tenebricola (Wider)

● *Lepthyphantes ericaeus* (Blackwall)

Lepthyphantes pallidus

(O. P.-Cambridge)

Lepthyphantes pinicola Simon

Lepthyphantes insignis O. P.-Cambridge

Lepthyphantes angulatus

(O. P.-Cambridge)

Lepthyphantes umbraticola Keyserling

Lepthyphantes curri Jackson

Lepthyphantes expunctus

(O. P.-Cambridge)

Helophora insignis (Blackwall)

Linyphia triangularis (Clerck)

● *Linyphia hortensis* Sundevall

● *Linyphia (Neriene) montana* (Clerck)

Linyphia (Neriene) clathrata Sundevall

● *Linyphia (Neriene) pettata* Wider

Linyphia (Neriene) furva

O. P.-Cambridge

Linyphia (Neriene) marginata

C. L. Koch

Microlinyphia pusilla (Sundevall)

Family LISYPHIDAE (cont.):

Microlinyphia impigra

(O. P.-Cambridge)

Allomenaea scopigera (Grube)

Allomenaea warhurtoni

(O. P.-Cambridge)

RURAL SURVEYS RESEARCH UNIT
DEPARTMENT OF GEOGRAPHY,
U.C.W., ABERYSTWYTH.

BIOLOGICAL SURVEY OF COMMON LAND

NATURE
CONSERVANCY
COUNCIL

CL No: (51) County: **HERTFORDSHIRE**..... [27] Grid ref: (**5 168 2305**) 10 Km sq. (**TL13**) O.S. Sheet: (**166**)

Status: [F] Area (ha): [17] [3] Altitude: Max. [60] Med. [60] Min. [60] Vice County: [20]

SITE NAME: OUGHTONHEAD COMMON, HITCHIN Date of Visit: [19.07.88]
[C] C = Information Collated

Recorder/ [IF] Time on [0h 45m] No. of [2] Access permission
Compiler: Site: photographs: from:

CONSERVATION () § () () § () () § () () § () () § ()

(% = % of site)

| | | | | | | |
|----------|--------------------|-------------------|---------------------|-----------|-------------|----------------------------|
| 1 = SSSI | 2 = NCR Site | 3 = NNR | 4 = LNR | 5 = ESA | 6 = SPA | 7 = National Park |
| 8 = ACRB | 9 = Heritage Coast | 10 = County Trust | 11 = National Trust | 12 = RSPB | 13 = Ramsar | 14 = Other (specify below) |

General description of site: An area of marshy grassland, reed and sedge swamp, scrub, wet and dry woodland, river and base-rich springs.

Owner(s): Registered owner - Hitchin U.D.C. - Now North Hertfordshire District Council.

| HABITATS (two/Phase 1) + Descriptions: | Areas (ha.) |
|--|-------------|
| B21 Unimproved neutral grassland | 5.7 |
| B5 Marshy grassland | 4.2 |
| A21 Continuous scrub | 2.5 |
| F12 Tall fen vegetation | 2.8 |
| A111 Broad leaved woodland | 1.5 |
| F11 Single sp. dominant - fen | 0.6 |
| A22 Scattered scrub | 0.8 |
| | |
| | |
| | |

Public access and recreation:

legally an urban common, so public right of access. This is difficult in practice, but paths are frequently used by walkers, and motorcyclists at times.

MANAGEMENT:

| | |
|-------------|------|
| Total Area: | 17.3 |
|-------------|------|

SITE CHARACTERISTICS:

| | | | |
|------------------|---|---|--------------------|
| Hay | | Grazing Time: | Grazing Intensity: |
| Mown | ✓ | Spring | None. |
| Cattle | | | |
| Sheep | | Summer | |
| Horses | | | |
| Rabbits | | Autumn | |
| Burning | | | |
| Crouse | | Winter | |
| | | | |
| Coppice | | All year | |
| Planting | | Irregular | |
| Thinning/felling | | Managed by: | |
| Rollarding | | Conservators [] | Management [] |
| | | | Committee |
| Scrub cleared | ✓ | Other [✓] | None [] |
| Recreation | | N Herts D.C. / Herts CC CMS | |
| Fisheries | | Sources of Information/references: | |
| Fishing | ✓ | N Herts Museum Service has extensive files on site, including management plan 1974 (T. James) | |
| Water levels | ✓ | Also, "Where to Watch Birds in Beds, Ben Buckle, Herts, Oxon" 1987. | |
| | | Field visit for photographs only. | |

Main Geology [] [] Main Soils [] []

Slope [0°] Aspect [0°]

Ridge + Furrow ☐ Flooding ☒

Scrub invasion ☒ Mature trees ☐
(>60 cm DBH)

Much dead wood [] Base-rich [✓]
wet flushes

Bare ground: [] Origin

Litter accumulation: [✓] Type Sedge and Reed

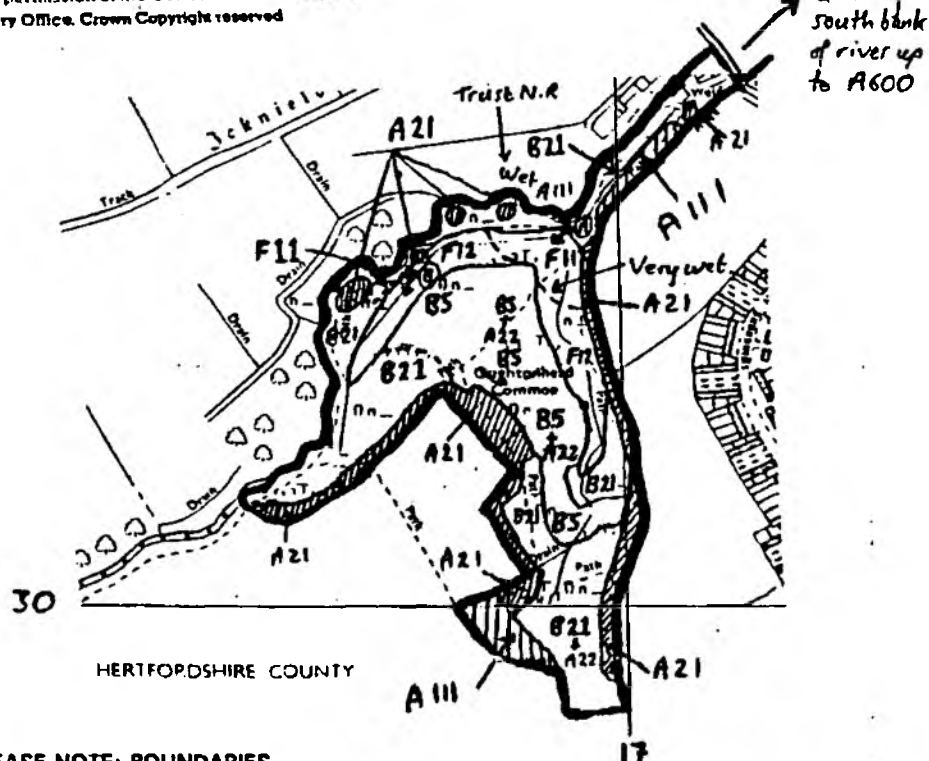
General notes on site:

No rights. SSSI until 1969. BTO Site.
Area to North is a Herts & Middx.
Wildlife Trust Nature Reserve.

Herts Groundwork Trust has worked on the site.
BTP OSG site.

MAP: (show scale, north, adjacent habitats) N 1:10,000

Reproduced from the Ordnance Survey 1:10,000 map
with the permission of the Controller of Her Majesty's
Stationery Office. Crown Copyright reserved



PLEASE NOTE: BOUNDARIES
INDICATIVE ONLY.

For definitive boundaries
consult common land
registers held by
Local Authorities.

Mapped from 1976 habitat map, in conjunction
with 1985 aerial photograph, and notes from 1988
visit. Main areas of scrub shaded (IIII); woodland
shaded (IIII) = direction of photographs (NEE)

& along
south bank
of river up
to A600

Fauna: The common is important for birds - on visit: Spotted Flycatcher, Blackcap, Chaffinch, Bullfinch, Tree Creeper, Willow Warbler, Woodpigeon, Greenfinch, Chiffchaff, Blue Tit, House Martin, Swallow, Yellowhammer, Carrion Crow, Reed Bunting, Sedge Warbler, Swift, Kingfisher, Wren, Moorhen. Other species recorded include Reed Warbler, Garden Warbler, White-throat, Lesser White-throat, Turtle Dove, Cuckoo, Lesser spotted Woodpecker, Grass-hopper Warbler. In winter - Teal, Snipe, Jack Snipe, Water Rail, Siskin and occasional Great Grey Shrike(continued on separate sheet - HERTS.051:.....)

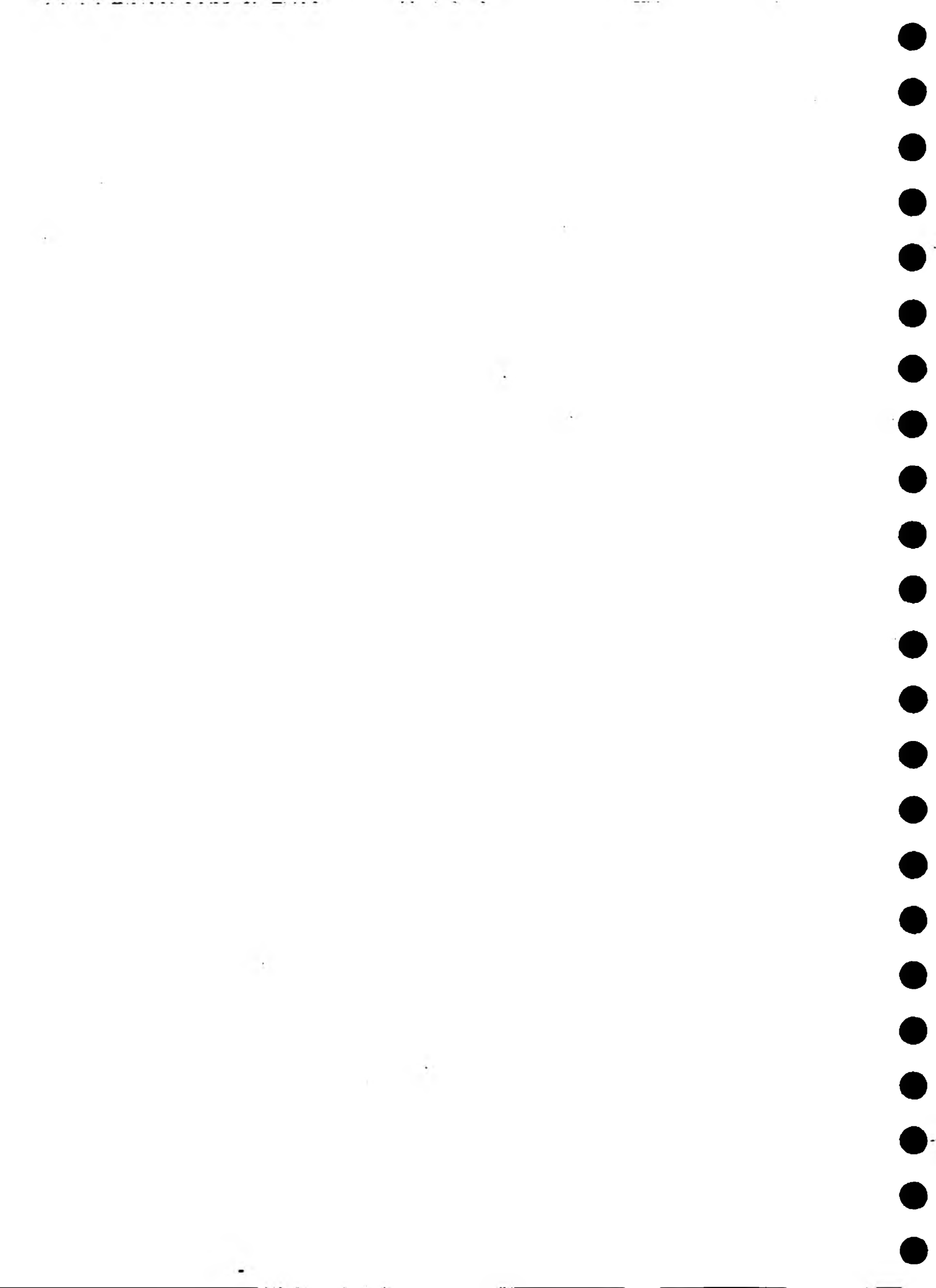
Vegetation: Marshy grassland and fen, with drier neutral grassland, scrub and woodland. Underlain by acid peat, but base-rich springs provide flushes, and freshwater component of site is important; the chalk stream is clear and relatively unpolluted. B21: unimproved neutral grassland is rank, and contains Festuca rubra, Dactylis glomerata, Arrhenatherum elatius, Deschampsia caespitosa, Festuca arundinacea, Lotus uliginosus, Lathyrus pratensis and Vicia cracca. B5: marshy grassland contains Caltha palustris, Carex paniculata, Juncus subnodulosus, Iris pseudacorus, Ranunculus flammula, Filipendula ulmaria, Eupatoria cannabinum, Carex acutiformis, Equisetum palustre. This grades into waterlogged F1 swamp, some of which holds mixed tall fen vegetation (e.g. Carex acutiformis/Filipendula/Phalaris) and some of which is dominated by single species, principally Carex acutiformis or Phragmites.(continued on separate sheet - HERTS.051)....

Management: In general terms, the site is drying out due to vegetation productivity and scrub invasion, and the site is now very rank as there is no grazing. However, water levels have been raised in past, and are maintained by a weir in the NE. This appears to have led to renewed waterlogging of parts of site, the maintenance of high water tables, and the development of fen vegetation, especially Carex acutiformis. Scrub clearance has been carried out, and there has been limited mowing of vegetation in the past. Other management problems are caused by occasional fires, vandalism and motor bikes. The main management priorities would seem to be the maintenance or raising of water levels, and control of scrub, which has spread considerably in the past decade. Mowing selected areas occasionally would help to provide structural diversity and reduce accumulation of biomass. Areas of Snowberry on the river banks should be removed.

ADDITIONAL NOTES FOR HERTFORDSHIRE CL 51, OUGHTONHEAD COMMON

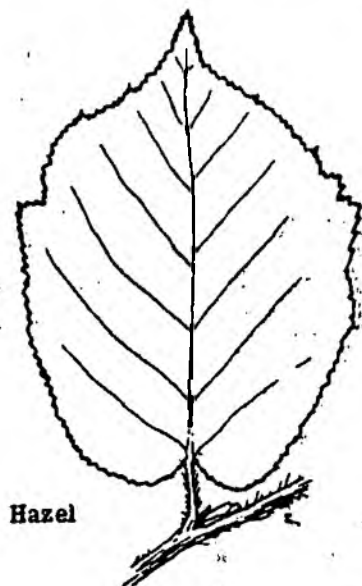
FAUNA (continued)..... Other vertebrates recorded include Frogs and Grass Snake, and the site holds a large population of Toads. Mammals include Muntjac, Harvest Mouse, Hare, Water Vole and Water Shrew. 7 species of fish have been recorded. There has been relatively little work on the invertebrates of the site, although the common is a ISR site grade C. 21 species of butterfly and 46 species of mollusc have been recorded, and the site appears to have good potential for invertebrates.

VEGETATION (continued)..... Water levels were high at the time of the visit, and there were a few small patches of open water. The uncommon species recorded in the past from the marshy parts of the common are still present, despite change in the habitat. These include Carex disticha, Rumex hydrolapathum, Dactylorhiza praetermissa, Valeriana dioica and Potentilla erecta. A21 scrub: there is much scrub on the common, including substantial amounts scattered across the site (A22). Principal species is Crataegus monogyna, with other species such as Rhamnus catharticus and Viburnum opulus. A111 woodland is wet carr, containing Fraxinus excelsior, Alnus glutinosa, Betula pubescens and planted Salix alba. The HMWT reserve to the north of the common is similar.

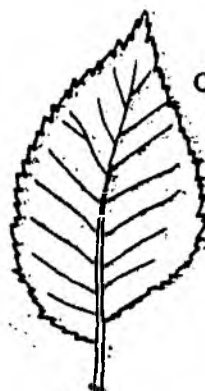


North Hertfordshire Museums Service

Leaves of trees and shrubs: mostly half size



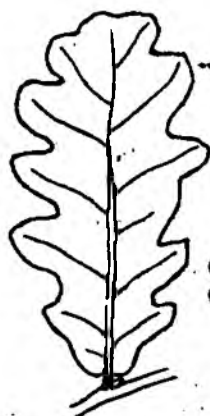
Hazel



Common
Elm



Crack
Willow



Common
Oak

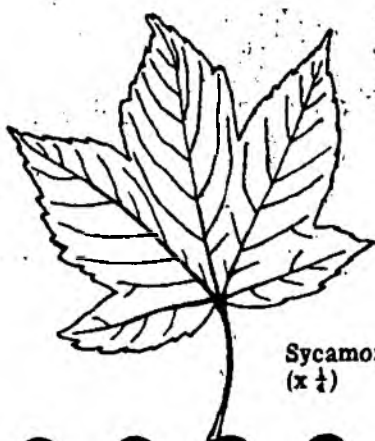
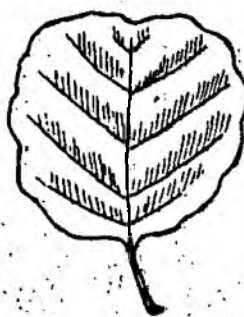


Birch

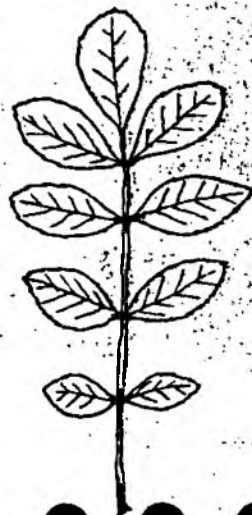


Sallow

Alder



Sycamore
(x $\frac{1}{4}$)



Ash
(x $\frac{1}{4}$)

Introduction

Hitchin is unique locally for having retained its medieval cow commons, of which Oughton Head is one. Part of the reason for this is that Hitchin was never enclosed from its open field system of farming. Instead, the town outgrew its common fields and enclosure became unnecessary. Another part of the reason why Oughton Head Common in particular was never cultivated lies in its formerly marshy condition. Like many such common grazings, it was poor land unfit for anything else. It also had an abundant water supply for cattle in its neighbouring river, once one of the most important sources of the Bedfordshire Ouse.

From early times, Hitchin's commoners were allowed to graze their cattle on the Common from May through the summer and winter to February. The cattle were herded from Butts Close, where they were gathered from their owners in the morning, and grazed on the Common by day, attended by a herdsman. Only after 1914 did this kind of use die out, since when the Common has been only a recreation area.

The river was harnessed for power early at West Mill, which ground corn from about 1600 to 1900. Lowering water levels, however, made operations difficult in the mid 19th century, and no doubt contributed to its closure. The mill was destroyed by fire in 1960.

North of the river, the present fen woodland derives from fifty years of neglect of formerly managed willow and osier beds. It is now a nature reserve.

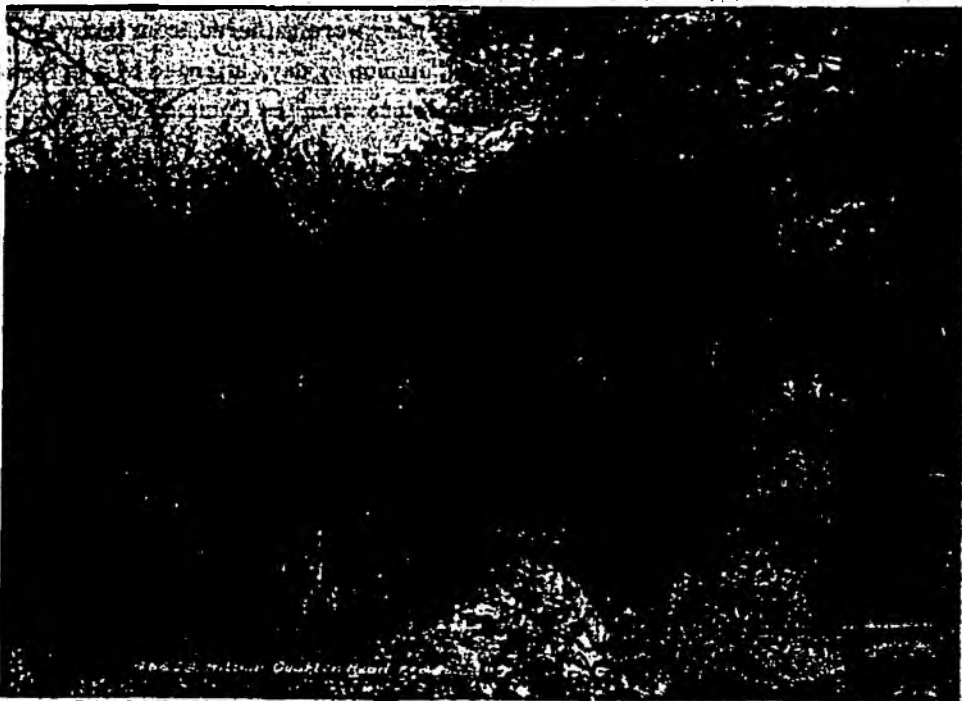
The springs still rise from their naturally cut hollow, but are much reduced from their strength of even thirty years ago. Part of the reason for this is the existence of a water supply bore-hole above the springs near the Pirton Road, but low rainfall over half a century has contributed to the decline.

Despite neglect and some deliberate damage, Oughton Head remains one of Hitchin's greatest natural assets, rich in wildlife and historical interest.

It is hoped that the visitor will find this brief guide useful. It is arranged according to stages, which are numbered consecutively and are indicated on the map at the back. These do not correspond to numbered markers along the route, but are merely intended to draw attention to various features at appropriate points.

Those wishing to identify some of the wildlife and flowers around them are recommended to use some such guide as "The wild flowers of Britain and northern Europe", published by Collins; and similar guides for birds, insects and mammals are available.

Please remember the Country Code, and do not pick wild flowers or disturb wildlife.



The River Oughton about 1900.

Photo: F. Latchmore

Stage 1

West Mill Farm house with its cobbled yard dates from the 17th century, and by the bridge over the river stood the mill itself, partly brick with a timber upper storey and hipped roof. A mill stood on the spot from at least 1600, and was used for grinding corn until it closed about 1900. The building remained derelict for many years, but was destroyed by fire in 1960. The mill-race remains, however, and the river level is kept artificially high by a weir, stopping fish and other freshwater life from moving upstream.

By carefully looking over the bridge parapet, see if any trout are visible. These fish like pure streams, and survive best where the water is cool. The water from the mill-race, rich in oxygen from the weir, is ideal for them, and they can often be seen here.

A characteristic sound of the mill yard is the monotonous cooing of the Collared Dove, but this would have been rare twenty years ago. It has recently invaded from eastern Europe and is now found commonly around gardens and farms. In the summer months listen for its cousin, the Turtle Dove, darker brown on the back and inhabiting bushes. Its song is a low purring sound.



Mallard ducklings.

From the mill yard, follow the path through the gate to the cross-paths and turn right towards the Common. The path leads across a small bridge and up the wooded bank of the millstream.

Stage 2

This wide straight stretch of river has been constructed to give a head of water for the mill wheel. Notice the remains of the mill-sludge arch along the river to your right. Nearby is the overflow sluice, which was once known as the 'Hitchin Waterfall', owing to the torrent which flowed over it especially in Spring. When the mill was operating, water levels were kept high, but have been lowered since the mill was burned down.

The bushes and trees on the millstream banks are fairly recent, as early pictures show cattle grazing on open grassland here. In summer, listen for the Chiffchaff, sounding like its name, or the rich flute warble of the Blackcap. In winter, however, you may see the little brown Redpoll feeding on old thistles, or the blue, black and yellow of the Great Tit. Down by the river in Spring and summer, look out for the large blue-flowered Water Forget-me-not and the dark green strap-like leaves of the Bur-reed, which in autumn has round knobbed fruits on spikes.

Follow the riverside path along the millstream until the view opens out across the Common to your left.

Stage 3

At this point the millstream turns into a natural river and meanders off to the right, fringed by reeds. In the 18th century, before the present high millstream was constructed, the river divided into two here, one arm having since been dug out to form the bank of the stream, leaving a deep ditch under the trees to your left. The construction of the millstream must have meant that more water flooded the Common, which was naturally marshy, and must have enlarged the marshy area considerably. Since water levels have been lowered, and since river dredging was carried out in 1959, this marsh has been reduced, causing the decline of many of the Common's rarer plants and animals. The recent dam is an attempt to increase the area of marsh again.



The Short-eared Owl has been seen here in winter.



Moorhen on its nest

Over the river is the Oughton Head Nature Reserve, managed by the Hertfordshire and Middlesex Trust for Nature Conservation. The ground on that side of the river was always swampy, and originally an open bog at this point. The large grey-leaved willows, called 'Cricket-bat Willows' because their timber was used for that purpose, were planted in the 1920's, and since various bushes and trees have developed round them, leaving little of the bog in existence. Traces of it can be seen in the large tussocks of Tussock Sedge, which is characteristic of fenland. Recent management of the reserve has tried to open up some of this undergrowth to allow the bog plants to survive.

To your left, notice the remaining area of sedge marsh beside the drainage ditch. At one time much of the lower end of the Common was like this. The large pointed leaves are those of the Great Water Dock, not very common in Hertfordshire. Down by the river, apart from the reeds and much watercress, notice in summer the ragged pink flowers of Ragged Robin. You might also find in Spring either Frog or Toad tadpoles, especially in the small marshy area. Please do not disturb them.

Continue along the banked riverside path, although here the river has bent away for a while. The path leads between two damp areas with a deep growth of sedges and other plants. Follow this path until the river reappears.

Stage 4

Any slow-moving river across flat lands forms meanders, and here the River Oughton has produced some very pronounced ones. It is also a very pure river, having little pollution even from agricultural fertilisers. Notice the rich plant growth, especially in summer, consisting of Fool's Watercress, Blue Water Speedwell, the great cushions of Water Starwort and others. If the river were polluted, few of these would survive, nor the freshwater life which inhabits them. If you stand and watch a while, you should see Three Spined Sticklebacks or perhaps a larger fish like the Trout, of which there are a few, never very large.

The bank on which the path runs was produced by dredging in 1959. This severely damaged the river and also stopped flooding of the marsh, hence reducing its richness of wetland plants. Notice the nettles and other large plants on the river bank. These result from the dredging, nettles being characteristic of disturbed ground, and show how long it takes for soil to settle down after disturbance.

Watch out for Moorhens here. In the summer, the chirpy sound of the Sedge Warbler may be heard, or you might see the black head and white moustache of the male Reed Bunting. In winter, flocks of finches, especially Goldfinches, feed on the thistles and other seed heads. Over the river are large stands of the Great Pond Sedge, as well as the sword-like leaves of the Flag Iris, with its bright yellow flowers in early summer.

Follow the path alongside the river for a while. It meanders in and out between willow bushes, but eventually turns away from the path again behind some denser willows.

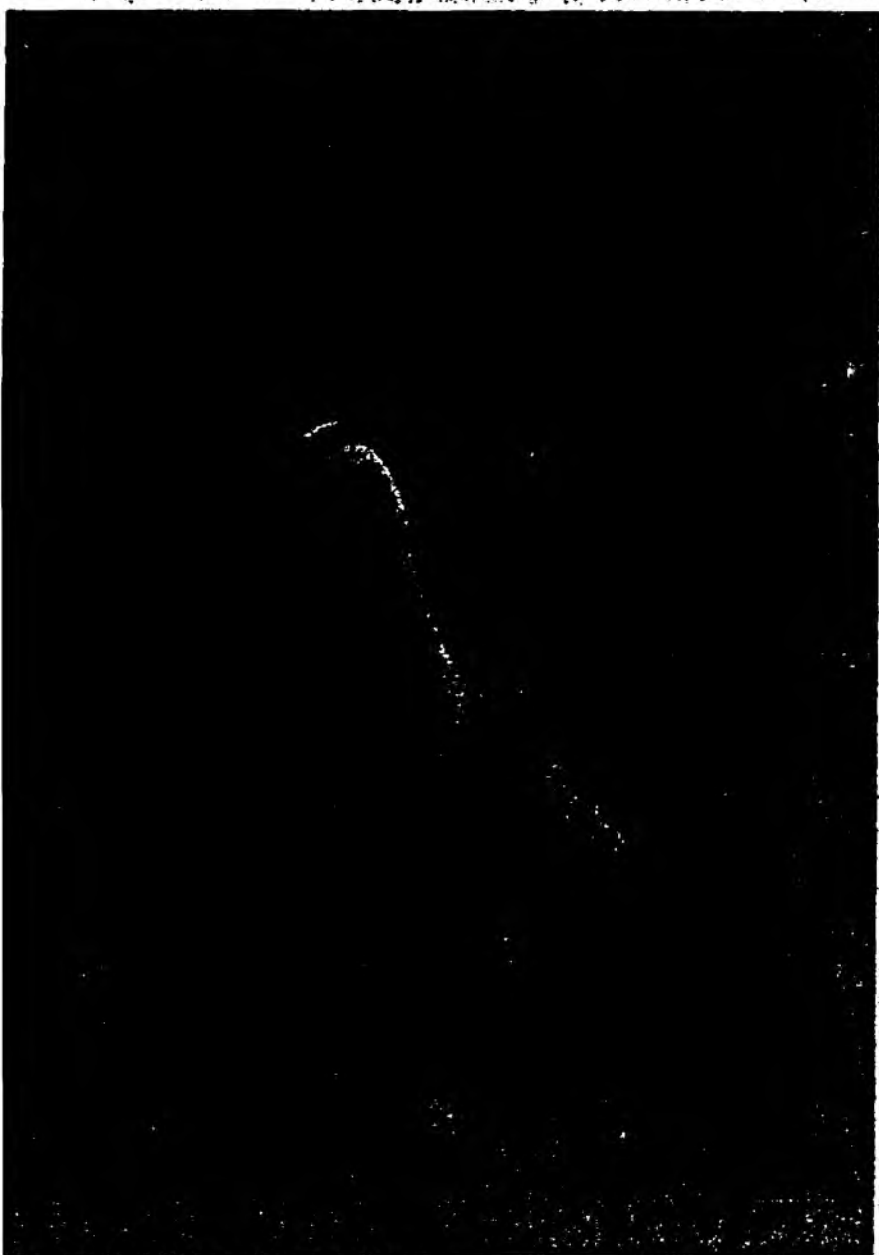
Stage 5

Left to itself, the whole of the wetter parts of the Common would soon be covered by this kind of willow scrub. This is known as 'carr', which develops on peaty soil which is especially rich in chalky water. The resulting carr is a 'fen' habitat. Apart from the various willows, notice the notched leaves of the Guelder Rose. In spring, this bush produces large heads of white flowers, with large petals only round the outside. In autumn, its fruits are bright red.

To the left of the path is a flat area covered with a dark green, leafy plant which has a profusion of white fluffy flowers in summer. This is Meadowsweet, so called from its heady scent. The area in which it is growing was once marshy, but has been allowed to dry out after dredging. Several unusual plants disappeared owing to this.

Look out for some of the Common's butterflies. In spring, the bright yellow Brimstone is frequent, as also the orange and white male Orange-tip. In later summer, you should see the eyed Peacock and the dark brown Ringlet, revealing its white eye marks underneath when settled.

Follow the path further round as it now runs beside the river again, this time overshadowed by a few birch trees. When the river comes out into the open on a bend, you have reached the next stage.



The Heron can best be seen early in the morning.

Stage 6

The nature reserve over the river is here dominated by birch rather than the willows we saw earlier. This is also "carr" and characteristic of fen. Notice the contorted roots of some of the trees where they have developed on unstable peat. These frequently fall across the river and have to be cleared before they block the flow of the stream. Formerly, this area was a sedge marsh, but the birches were allowed to develop for sporting. Very little of the original plant life now survives beneath them.

To your left, notice that the open grassland of the Common is relatively short. Here, rough cutting of the grassland is being carried out to encourage the more delicate wild plants to reappear. The Skylark still occurs here, and in winter flocks of Redwings and finches feed. You might see the hovering shape of a Kestrel searching for prey.

The path continues alongside the river, passing a wide pool with a worn edge created by paddling children over many years, and finally up a bank by some old beech trees. This is the end of the Common itself, but the path leads on alongside the river beneath overhanging trees.

Stage 7

In the early part of the last century, the owner of this land added to the few existing Beech trees alongside the river, planting more Beech, Horse Chestnut, and Alder. By 1900, photographs show that the southern side of the river was closely overshadowed by a dense stand of trees. Many have since fallen, but the remainder still create an overshadowing canopy by the river.



Skylark at its nest.

The nature reserve opposite, by contrast, was much less overgrown in 1900. It had probably been used for centuries as a sedge marsh and willow grove, where old pollards were cropped to provide hedge withies. This use died out about 1914, since when a dense growth of alders has overtaken the sedge marsh, derived from seed from the planted trees.

Notice the small steep-sided bank above the river, with many old stumps along it. This shows how much water levels have fallen since 1900, when the river reached as far as this. Now the river is reduced to less than half its former flow, and sometimes nearly runs dry.

During the summer, notice the white flowers of the Water Crowfoot in the centre of the river. This is a fairly scarce species restricted to chalk streams. The Kingfisher is a regular visitor here, using overhanging branches to perch on for fishing. In winter, you may see small greenish Siskins feeding in parties on the Alder cones.

The path winds alongside the river, coming under some more densely overhanging trees.

Stage 8

Notice here that the bed of the river is not silty, but consists of rubbly chalk. For most of its length across the Common the river has had a deep bed of silt, but here the bed-rock of chalk shows through. When water is low, springs rise from this point out of the Melbourn Rock, which is a hard layer in the chalk with fissures through which water percolates.

If some of these lumps are carefully picked up, small dark brown worms can be found under them. These are Flatworms, which are very primitive, and can only survive in pure water, usually at a fairly low constant temperature, which is provided by the springs.

Another feature of the river here is the lack of vegetation. Some stands of Fool's Watercress survive, but under the dense shade little can develop.

For this reason, the banks further downstream are not allowed to become too overgrown.

Follow the path beneath these trees to a large pool of the river at a bend.

Stage 9

From here the river follows a steep bank on its south side. In prehistoric times, the river would have risen from this point, and has since cut itself back into the chalk outcrop, following the fissure line of the springs.

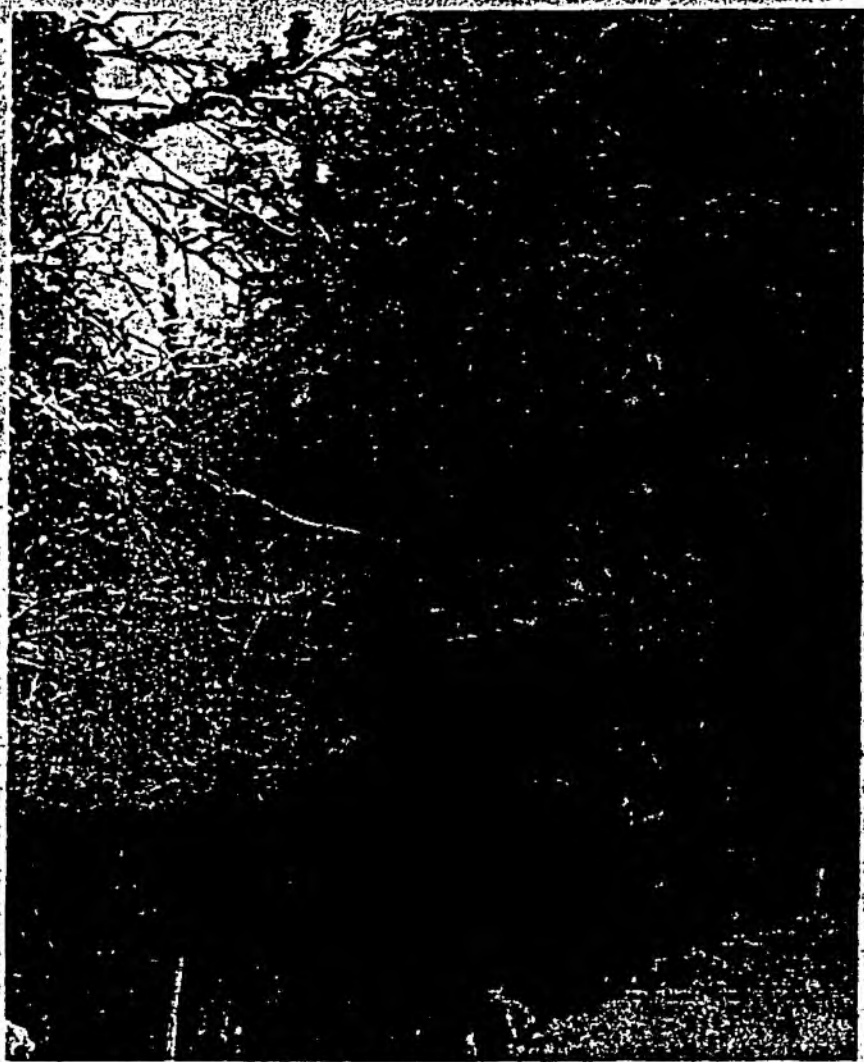


The skulking Water Rail is regular in winter.

Over the river, notice the particularly good stand of Alders, although some have been damaged recently by a fallen tree. Also notice, by the side of the river, some different younger trees with large notched leaves. These are Sycamores, an introduced tree which is spreading steadily through the Alder wood, especially now that water levels are lower. Alders require high water levels for their seed to germinate, and therefore if nothing is done, they will be replaced by Sycamores, which are far less useful as a source of food for wildlife. Also, the leaf-litter of Sycamores tends to destroy plant growth under the trees, and therefore the spread of this species is a threat to many of the local plants and animals of the nature reserve.

In the autumn, watch out for the elegant grey, white and yellow shape of the Grey Wagtail, feeding from logs by the stream. The Alders are also a favourite spot for the Treecreeper, which climbs each tree in turn in search of insects.

For the last section of the riverside walk, the path leads around the outcrop of the chalk bank and beneath the deep shade of bushes and trees until it comes out at the bowl of the spring source.



Oughton Head, March 1924. Photo: R. Morse.

Stage 10

This is Oughton Head itself, where a large number of springs rise from the Melbourn Rock beneath steep chalky banks. Owing to the decline in river levels, many of these no longer flow, but especially in April chalky water may be seen rising from small holes in the silt at the spring head, making a permanent dance of small chalk particles in suspension.

Oughton Head was once a small settlement. The last cottage was demolished about 1892, and used to stand on the north side of the springs. It is from the former garden of this that many of the trees originate, including the Sycamores. Earlier, a farmstead existed south of the springs.

The decrease in the river level may best be judged by a record given by Arthur Foster of Hitchin of an eight pound Trout caught beneath the trees at Oughton Head in 1894. The reason for this decrease in water levels lies in the sinking of boreholes for water supply, and especially the borehole near the road to Pirton, above the springs, in 1944, coupled with low average rainfall for most of this century.

From the spring head, the path leads up the steep bank behind the springs and turns left along Oughton Head Lane, following the edge of the field, with the hedge on your right.

Stage 11

The return walk must take us away from the river and the Common for a while, as we follow Oughton Head Lane. This is now merely a bridleway, but in the 18th century was the main road to Pirton from Hitchin.

Some idea of the age of the road may be had from studying the hedge by the path. See how many species of shrub and tree you can identify. If the number of woody shrubs, excluding brambles and so on, is counted along any given length of 30 yards, the number multiplied by 100 is supposed to indicate the rough age of the hedge in years. Along here, you should find about 6 or 7 species in 30 yards, including Hazel, Privet, Wayfaring Tree, and Field Maple perhaps, as well as the more usual kinds of trees like Oak and Ash. This might therefore indicate a hedge of at least 600 years. The ground flora beneath the hedge might also give us clues as to its age.



Whitethroat at its nest.

Here we may find the winter green stems of Dogs Mercury, flowering with spikes of tiny yellow flowers in spring. This is supposed only to exist in old hedges, as it is incapable of spreading very fast, and then only under the permanent cover of trees.

See what kinds of bird inhabit this hedgerow and the neighbouring fields.

A wood to your right, behind the hedge, has a Rookery in spring and summer. The scratchy warble of the Whitethroat may be heard along the hedge, as well as the familiar "little-bit-of-bread-and-no-cheese" call of the male Yellowhammer. A dense old hedge like this is important for wildlife, acting as a nesting place, source of food and cover for a wide range of birds, mammals and insects.

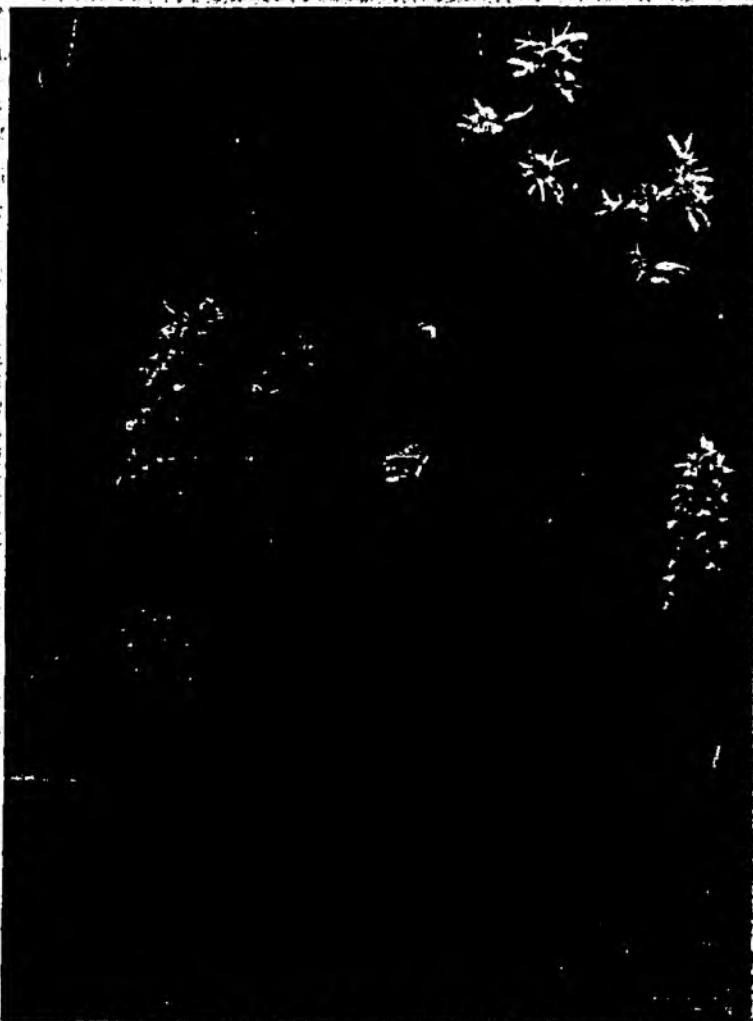
The lane leads along the open field of Oughton Mead, through an old elm grove, recently killed by Dutch Elm disease, and finally to the lower end of the Common, also with dead elms. At a cross paths, turn left between concrete bollards onto the Common, and bear right alongside the hedge.

Stage 12

It was to this end of the Common that the cow-herd brought his cattle along Oughton Head Lane from Hitchin. To your left there is a grove of Beech trees. These were planted by William Lucas in 1842, when he was granted a corner of the Common in exchange for some of his land taken by the Manor Court of Hitchin.

Lack of grazing has allowed the grassland here to become very rank, with few of the characteristic plants occurring very commonly. In summer, look for the purple heads of the Tufted Vetch, while in spring the bright blue of Germander Speedwell is frequent in some places. Later in summer, the tall fluffy pink heads of Hemp Agrimony are eye-catching, along with the pink and white single flowers of the Great Hairy Willowherb, or 'Codlins-and-Cream'.

Follow the path along the right side of the Common between its dense hedge and the bushes along the winding stream. This leads through some denser bushes of willow and onto a small rise, with a view over the Common to your left.



A rich marshland flora.

Stage 13

This final stage is to illustrate how the Common would rapidly be overgrown with bushes if allowed to go completely wild. Although these hawthorns and willows make good nesting sites for birds while forming scattered clumps, a dense growth becomes much less useful.

The small stream which follows the side of the path, often obscured by bushes, also needs periodic clearance to remain interesting. When the Common was grazed, this and other ditches were regularly cleared, and several unusual plants depended on this for their survival. Future management of these ditches, and of the Common in general, is designed to allow the survival of as many of these unusual plants and other wildlife as possible.

On the way back along the path towards the river, listen for other birds of the Common: the rattle of the Lesser Whitethroat in May and June or the chuckle of the Fieldfare in winter. In the autumn, this end of the Common is frequented by large flocks of finches, especially Linnets and the large brown Corn Buntings, looking like large female sparrows. Notice also the large hillocks formed by the Yellow Meadow Ant, a species characteristic of old pastures.

The path leads along between blackthorn and hawthorn bushes to the bank of the millstream. Turn right beside the river, and return towards the mill.



West Mill about 1900

Photo: F. Latchmore

Trail guide written by Trevor J. James

Photographs by Brian R. Sawford, unless otherwise stated.

Published by North Hertfordshire Museums Service, 1981.

Oughton Head is an almost unique place in Hertfordshire. Its value for wildlife has been recognised for over a hundred years, and we hope your visit has been enjoyable.

If you have found this guide interesting, you might like to find out more about the area's natural history, or the work of maintaining it. For further details, contact:

North Hertfordshire Museums Service,
Natural History Department,
The Old Fire Station,
High Street,
Baldock, Herts.

Tel: Baldock 894352.



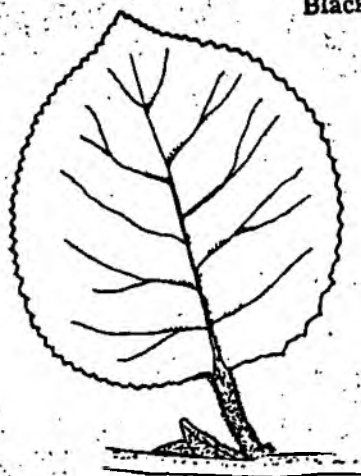
Hawthorn



Blackthorn



Guelder Rose



Wayfaring Tree



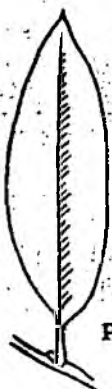
Elder



Buckthorn



Spindle



Privet

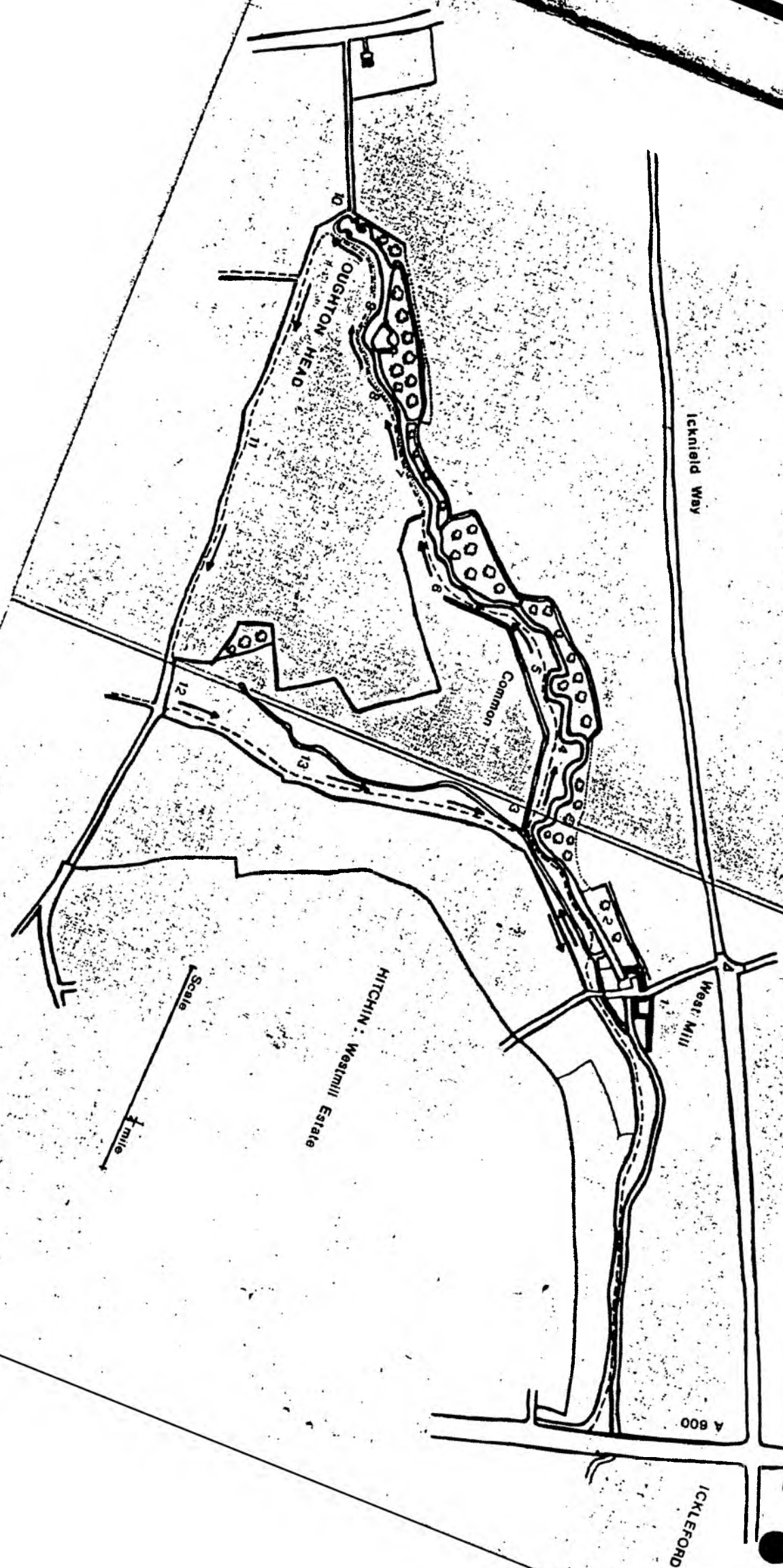


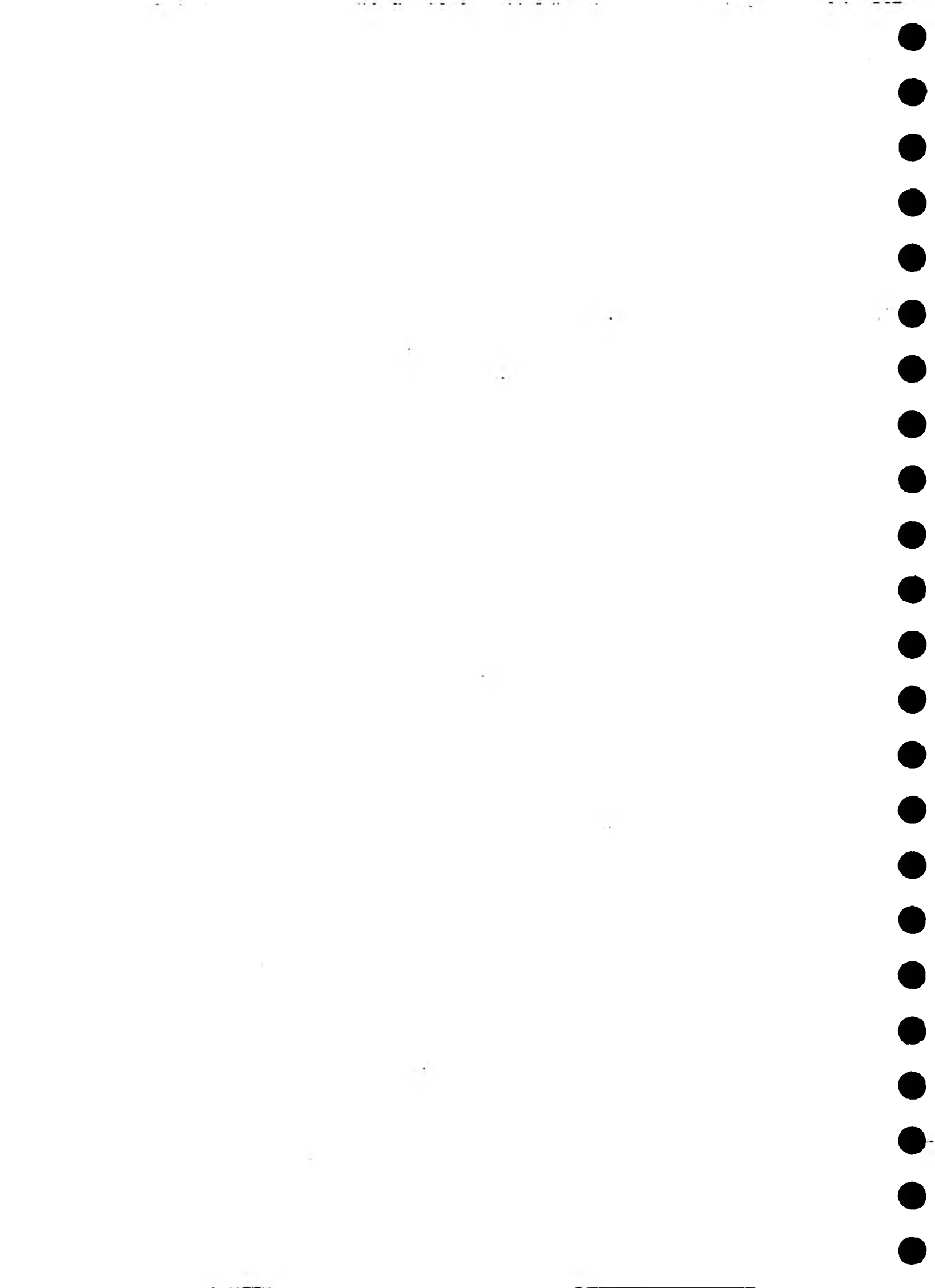
Field Maple

Leaves of shrubs: all half size

MINSIE BACK LAP

Oughton Head - guided walk





Draft Copy

Internal HMWT Document

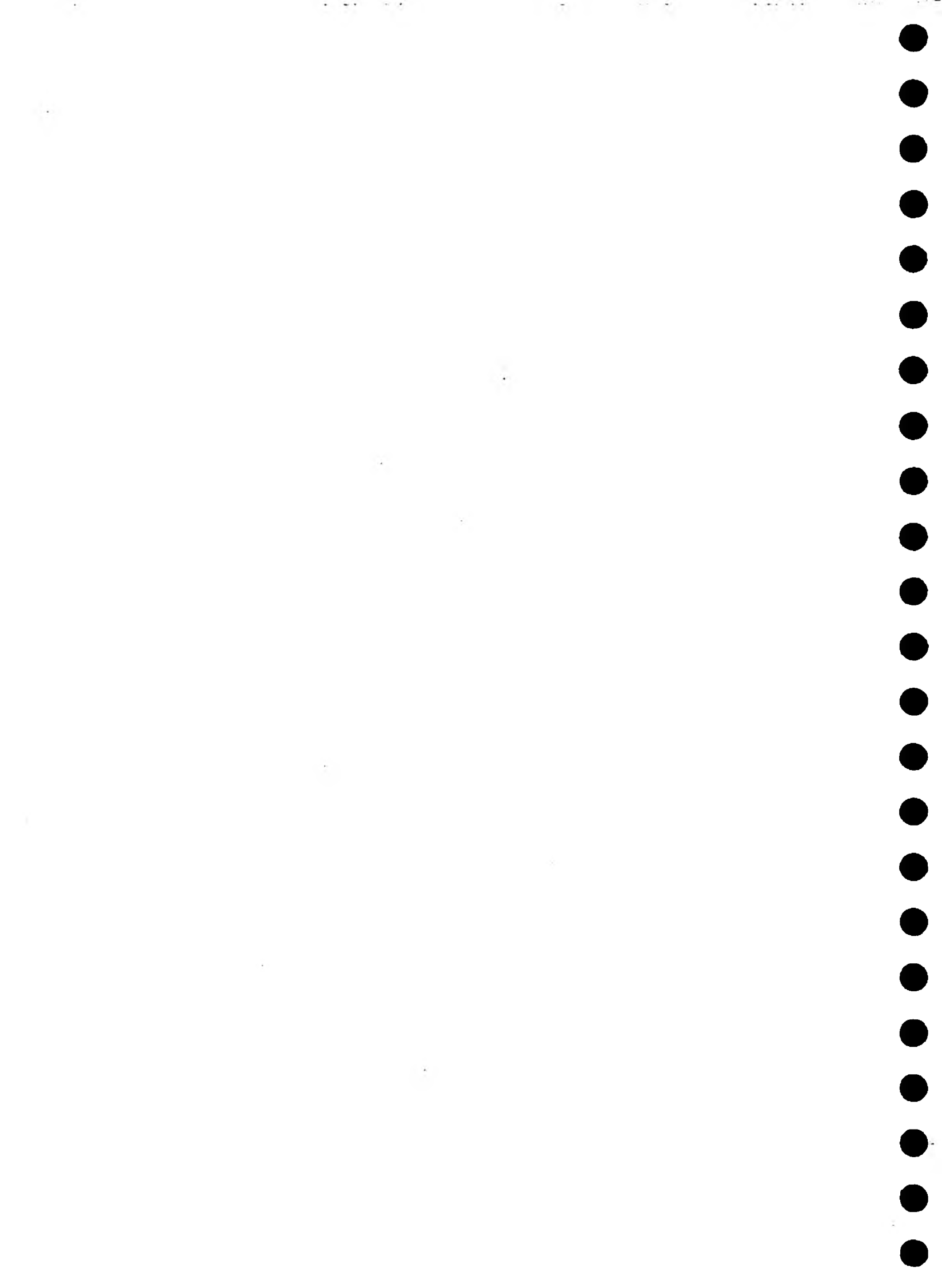
Confidential

OUGHTON HEAD MANAGEMENT PLAN

September 1993



HERTS & MIDDLESEX
Wildlife Trust



OUGHTON HEAD NATURE RESERVE MANAGEMENT PLAN

1. General Information

1.1.1 Location

Site name: Oughton Head

Site status: Herts and Middlesex Wildlife Trust nature reserve.

Local planning authority
North Herts District Council

Grid reference
TL 166304

| Area | Ha |
|----------|-----|
| woodland | 4.9 |
| river | 0.7 |

OS maps 1:50000
Landranger 166

1.1.3 Tenure

Owner: Hertfordshire County Council

Type of holding

The land is owned by Hertfordshire County Council. Herts and Middlesex Wildlife Trust (HMWT) manages the site on the basis of an informal agreement and also acts in an advisory capacity.

Rights of access

There is no public right of access to any part of the reserve. However, there is a right of way along the river from which the reserve may be seen. A right of way also exists at Oughton Head Springs where the bridleway from Hitchin to the Pirton Road (Oughton Head Lane) is joined by the bridleway from West Mill.

Contacts

1. Conservation Officer, Herts and Middlesex Wildlife Trust, Grebe House, St. Michaels St., St. Albans, Herts, AL3 4SN.
Tel. 0727 858901

2. Voluntary Warden: Teresa Brown, 34 Armour Rise, Hitchin, Herts, SG4 0RJ.
Tel. 0462 451739

2. CONSERVATION STATUS

2.1.1 Site description

The reserve consists mostly of a linear strip of mixed wet woodland running adjacent to the river Oughton, which has its source at the western end. The springs rise from the underlying Melbourn Rock, which is overlain by middle chalk. Most of the reserve is on a Pleistocene deposit of chalky boulder clay with some gravel. The soils derive from peat deposits and tend towards acidity but are neutralised by the chalky, alkaline water, producing a fen soil type.

The site was formerly a managed fen, used for growing osiers as well as cut for sedges. Later, around 1920, cricket bat willows were planted at the eastern end. Both purple willow *Salix purpurea* and cricket bat willows *Salix alba x fragilis* survive from this period. The Purple willows may also be native. Most of the site is now in an advanced stage of natural succession, first by willow swamp and then by ash *Fraxinus excelsior*, oak *Quercus robur* and downy birch *Betula pubescens*. The two western compartments are dominated by mature alder carr *Alnus glutinosa* which are being invaded by sycamore *Acer pseudoplatanus*. Other tree species include white willow *Salix alba*, wych elm *Ulmus glabra*, english elm *Ulmus procera*, beech *Fagus sylvatica* and horse chestnut *Aesculus hippocastanum*. The locally rare almond willow *Salix pentandra* is also present. In the drier areas the understory is dominated by hazel *Corylus avellana* and elder *Sambucus nigra*. Other shrubs include guelder rose *Viburnum opulus*, wayfaring tree *Viburnum lantana*, blackcurrant *Ribes nigrum*, redcurrant *R. rubrum* and gooseberry *R. uva-crispa*.

The original fen vegetation now exists only as small remnants located adjacent to the river, typified by the presence of tussock sedge *Carex paniculata*. The site once supported several Herts rarities, notably grass of parnassus *Parnassia palustris* and bog cotton *Eriophorum angustifolium* at the eastern end which was once a bog. This area has developed into mature willow/fen carr. Surviving plants of fen and swamp habitats include greater pond sedge *Carex riparia*, the ferns *Dryopteris carthusiana* (narrow buckler fern), *D. dilatata* (broad buckler fern), *D. filix-mas* (male fern) and *Athyrium filix-femina* (lady fern). Flowering plants include lesser spearwort *Ranunculus flammula*, marsh marigold *Caltha palustris*, purple loosestrife *Lythrum salicaria* and woodruff *Galium odoratum*. The latter is a rare find on a peaty soil. There is a fairly extensive area of common reed *Phragmites australis* at the eastern end of the site and smaller areas along the river margins. The river margins are also dominated in places by beds of greater pond sedge *Carex riparia* and great willowherb *Epilobium hirsutum*.

The river itself is shallow near its source at the western end where its chalk shingle bed is exposed in places; at the eastern end the water is deeper and up to one metre of silt covers the bed. The river itself is dominated by watercress *Nasturtium officinale*, fool's watercress *Apium nodiflorum* and in places chalk water crowfoot *Ranunculus penicillatus* var. *vertumnus*, one of the only sites for this in Herts. Other aquatic plants of note are water starwort species *Callitriche obtusangula*, mare's tail *Hippuris vulgaris* and blue water speedwell *Veronica anagallis-aquatica*. Water quality is quite good, as would be expected of a spring fed stream, and is indicated by the presence of a range of aquatic invertebrates including shrimps, stoneflies, caddisflies, pea mussels and flatworms. Fish species are somewhat restricted due to the shallowness of the water and probably only include three spined stickleback, bullhead, and trout. The area around the reserve was once renowned for its birds with an historical list of 121 species, several of which are rarities. The reserve contains a good population of common birds including breeding stock dove, goldcrest, spotted flycatcher, garden warbler, kingfisher and woodcock. Winter visitors include good numbers of siskin, redpoll, redwings and water rail.

2.2.1 Evaluation

Size:

At 5 ha, the reserve is one of the larger fen woodlands in Hertfordshire.

Diversity:

For such a small reserve the diversity of habitat types is surprisingly large, comprising wet and dry woodland, fen, aquatic and water margin habitats. In addition there are several ditches and ponds which are important for remnant fen species. Species diversity is correspondingly good with plants and animals associated with both wetland and mature woodland within a relatively confined area.

Naturalness:

The site is typically semi-natural and probably has a long history of being managed as a fen. When this ceased natural succession took place resulting in the mature fen carr seen today. Planting of willows, horse chestnuts and probably sycamore has also taken place in and around the reserve in the last 150 years.

Rarity:

The remnant fen components are notable within the county, being one of only half a dozen such sites. Mature alder carr is also unusual in Hertfordshire. *Ranunculus penicillatus vertumnus* is found at one of its only Hertfordshire sites. *Carex paniculata*, *Dryopteris carthusiana*, *Ribes nigrum*, *Rumex hydrolapathum* are all of local interest. In addition the site supports quite a diverse fungal and lichen flora.

Fragility:

The most important habitat: the remnant fen community, is also the most fragile in that it depends largely for its continued existence on a wet, peaty soil. The main problem here is the depleted river flow that has dramatically declined within the present century. This situation is seriously exacerbated by the presence of the nearby pumping station that abstracts water to supply Hitchin from the same ground water supply that feeds the river. The resulting dessication of the peat allows species such as stinging nettle to take over at the expense of the fen flora. Low flows combined with leaf litter from the mature trees creates high amounts of siltation in the ditches, ponds and the river itself leading to a reduction in aquatic life in general. The natural succession that has now almost reached its stable final phase has also changed what was once swamp fen into mainly woodland. For most of the site this process is practically irreversible.

Typicalness:

The reserve is a typical mature fen woodland.

Recorded history:

Early maps (before 1850) only show trees along the south side of the river at Oughton Head. There is a series of watercolour paintings by the father and son, Samuel Lucas, dating from about 1820 to at least 1870 which clearly show low scrub in various stages of development at various times of the year along the north bank of the river opposite the common. Several of these paintings show management activities along the north bank near the springs: especially one painting about 1850 which shows men clearing sedges and cutting pollarded willows between pools and ditches of water. This kind of managed fen would most probably have been

a very longstanding type of management for the area. Surrounding fields are known to have been mostly grazing land early this century, and willow coppicing and pollarding were still being practised in 1914 when the farm and the fenland were obtained by the county council. From about 1924, the practice of cutting osiers and willows for fencing in the 10 acres nearest the Mill was stopped in order to maintain shooting in the woodlands.

Ecological position:

The reserve is ecologically the most important water source of the river Hiz. It is located next to Oughton Head Common which is an important local area of grazing marsh, albeit unmanaged and dessicated. The north of the reserve is open countryside of arable fields and to the south and east the outskirts of Hitchin.

Potential:

The potential to reverse the ecological trends of both maturing woodland and the drying of the peat soil to produce the former fen habitat with willow and alder carr, is limited. Despite this it may be possible to manage what little water there is more effectively to at least keep some parts of the reserve wet, combined with active management of the remnant fen characterised by the presence of tussock sedge. In addition, a small area of the site has been managed in the past to promote reed fen, by control of water levels and by tree removal. This could be continued and expanded.

As a Trust nature reserve the site has very few visitors, except for the regular volunteer work party and occasional intrusions from motorbikes or illicit shooting. Access into the reserve is very difficult, both in terms of getting into the reserve and because of the conditions in the reserve: muddy, overgrown apart from the main path and potentially hazardous near water. Although the Trust has an open access policy for reserves, this is not a site that lends itself to easy access both in practical terms and because of the sensitivity of such wetland sites.

Intrinsic appeal:

The reserve is best seen from the footpath that runs parallel to it from the opposite side of the river, and from here its appeal lies in its undisturbed nature and as a refuge for wildlife.

2.2.2 Identification/confirmation of important features

| | Site Features | Importance | | |
|---|---|------------|-----------------|---------|
| | | National | Regional | Local |
| 1 | Geology & geomorphology Sedge peat Spring head | | Average | High |
| 2 | Vegetation types Tall Fen Alder carr Willow carr | | High Average | High |
| 3 | Species | | | |
| | Plants | | | |
| | Tussock sedge | | | High |
| | Lady fern | | | High |
| | Blackcurrant | | | High |
| | Almond willow | | | High |
| | Water Dock | | | High |
| | Chalk river water crowfoot | | | High |
| | Animals | | | |
| | Kingfisher (breeding) | | Average | |
| | Woodcock (breeding) | | Average | |
| | Water Rail (wintering) | | | High |
| | Water Shrew | | | High |
| | Water Vole | | | High |
| | Grass Snake | | | High |
| | Bulhead | | | Average |

2.2.5 Ideal management objectives

The ideal management objectives for the site are:

1. To maintain and enhance the remnant fen community.
2. To maintain the diversity that is the product of natural succession i.e. the wet and dry woodland components.
3. To maintain and enhance the river, river margin and ditch habitats.
4. To maintain the sites' status as a nature reserve, through seeking a formal management¹³ agreement for the site.
5. Promote the general appreciation of the reserve by the public

2.4.1 Rationale

In ecological terms the most important aspect of the reserve is the surviving fen community and this should be the priority for conservation on this site. There are however two major factors which limit the potential to restore the fen community to its former status : firstly the advanced state of natural succession has turned most of the original fen into woodland and resulted in much of fen flora disappearing under the shade of trees and drying out from the transpiration of the trees. The second factor is the longer term drying out of the fen peat that has occurred during this century due to weakening springs and more recently the abstraction of ground water. The mature carr/woodland could be felled to create open conditions formerly required by the fen community but the likelihood is that this would produce a sort of coppice rather than fen, particularly in the dessicated soil conditions. In addition, the carr has its own ecological value. The key to conserving fen habitat is really the availability of water and it is very unlikely that ground water is going to increase. However, even though the actual amount of water is probably decreasing, better use could be made of the water that is available along this stretch of the river. The management of water levels through the reinstatement of ditches could be used to give discrete surviving remnants of fen the conditions they need to flourish and it would be these areas that would also benefit from active management of trees and shrubs to produce open conditions.

The majority of the reserve is undisturbed woodland offering good habitat for breeding and wintering birds, invertebrates and small mammals. The range of invertebrates in particular is likely to be extensive in a habitat that offers much standing and lying dead wood and which also varies from being very wet to dry. There may be some value in coppicing parts of the woodland, opening up the canopy to add diversity, particularly in the drier parts where hazel is the dominant understory shrub. Felling trees along the river bank will benefit the marginal vegetation, allowing light into the river and help prevent build up of leaf litter which adds to siltation problems on the river bed. The ideal management option for the woodland as a whole is limited intervention rather than active management.

The river itself, whilst only half under the jurisdiction of the Trust, is the key to the effective management of the reserve. The river is very shallow in places due to low flows and this contributes to siltation. Years ago the river was kept free from excessive waterweed by the local council but this is no longer done and the weed also contributes to silt problems, as do the overhanging trees shedding their leaves. The Trust has no control on the south bank of the river but could coppice the trees on the north bank. With the agreement of the council the Trust may also be able to remove excessive waterweed from time to time from the whole river should this prove necessary.

General access for visitors is limited due to the lack of rights of way, the river and the often wet ground conditions. Presently the site is hardly visited except by regular volunteer teams and, less desirably, 'joy riders' on motorbikes. Encouraging greater access for the public is not suitable here, although greater emphasis could be made of seeing the reserve from the permissive path on the opposite side of the river. Interpretation signs should be visible from this path and also at the entrance to the reserve by the spring head. Illicit access should be discouraged. Specifically fencing should be erected at the spring head to prevent motorbikes.

4. Promote the intrinsic value of the site to the public whilst restricting access to path on south side of river.

General access and recreation:
restricted.

1. Provide new reserve signs to be seen from opposite bank and at spring end.

2. Maintain/equip site with fencing to prevent motorbike access.

3. PRESCRIPTION

3.1.1 Project Register

Records

RF03 Monitor Fen Vegetation in compartments 4 and 5. Permanent quadrats and fixed point photography. May to August.

Management

Estate- habitat manipulation

Manage Fen community by:-

MH57 Clear and maintain ditches from the river into the reserve. Compartments 1/2, 2, 3, 4, 4/5. August to March.

MH52 Clear scrub from around best examples of remnant fen, especially the Tussock sedge areas. Compartments 4 and 5. September to March.

MH52/MH65 Remove overhanging trees from fen and ditch areas. Compartments 1/2, 2, 3, 4, 4/5 (ditches) and 4 and 5 (fen). September to March.

MH53 Maintain tall fen vegetation by cutting and raking. Compartments 4 and 5. August to September.

Manage woodland by:-

MH05 Allow natural succession to continue. Compartments 1,2 and 3.

MH00 Coppice hazel on rotation. Compartment 4. October to March.

MH02 Thin birch and ash standards. Compartment 4. October to March.

Manage river/ river margins by:-

MH64 Clear weed from river as required. Adjacent all compartments. September to October.

MH00 Coppice riverbank trees on rotation. Compartments 1,3,4 and 5. October to March.

MH64/MH69 Remove trees obstructing the river. All compartments. August to February.

MH53 Cut and rake small areas of reed. Compartments 4 and 5. November to March.

ME30 Repair boarding at spring-head areas. Compartment 1. Anytime.

Estate- estate fabric.

Prevent damaging access by:-

ME00 Equip site with fencing to prevent motorbike access. Compartment 1. Anytime.

Improve reserve interpretation/ education by:-

M150 Provide new reserve signs to be seen at spring-head and from the opposite bank. Compartments 1,3 and 5. Anytime.

3.1.2 Project groups

Operational objective: Maintain and enhance the remnant fen community.

| No. | Outline Prescriptions | Project group |
|-----|--|---------------|
| 1.1 | Clear and maintain existing ditches from the river into the reserve. | MH57 |
| 1.2 | Clear scrub from around best examples of remnant fen, especially tussock sedge areas | MH52 |
| 1.3 | Remove overhanging trees from fen and ditch areas. | MH52/MH65 |
| 1.4 | Maintain tall fen vegetation by cutting and raking. | MH53 |
| 1.5 | Monitor fen vegetation. | RF03 |

Operational objective:Maintain and enhance the wet and dry woodland components.

| No. | Outline Prescription | Project group |
|-----|---------------------------------------|---------------|
| 2.1 | Allow natural succession to continue. | MH05 |
| 2.2 | Coppice hazel on rotation. | MH00 |
| 2.3 | Thin birch/ ash standards. | MH02 |

Operational objective:Maintain and enhance the river and river margin habitats.

| No. | Outline Prescriptions | Project group |
|-----|--|---------------|
| 3.1 | Clear weed from river as necessary. | MH64 |
| 3.2 | Coppice riverbank trees on rotation. | MH00 |
| 3.3 | Remove any trees obstructing the river. | MH64/MH69 |
| 3.4 | Manage small areas of common reed by cutting and raking. | MH53 |
| 3.5 | Repair boarding at spring-head areas. | ME30 |

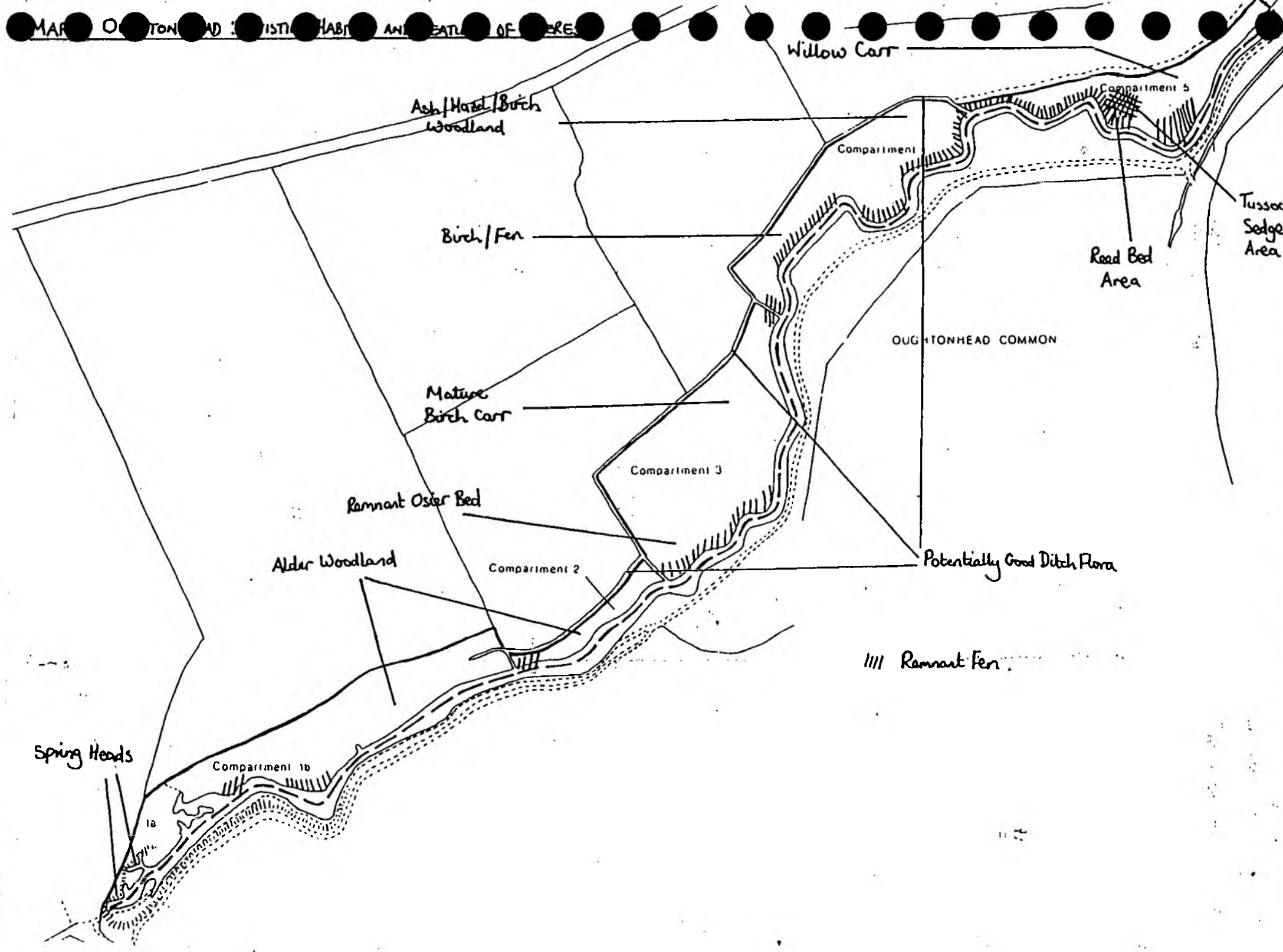
Operational objective: Promote the intrinsic value of the site to the public whilst restricting access to path on south side of river.

| No. | Outline Prescriptions | Project group |
|-----|--|---------------|
| 4.1 | Provide new reserve signs to be seen from opposite bank and at spring end. | M150 |
| 4.2 | Maintain/equip site with fencing to prevent motorbike access. | ME00 |

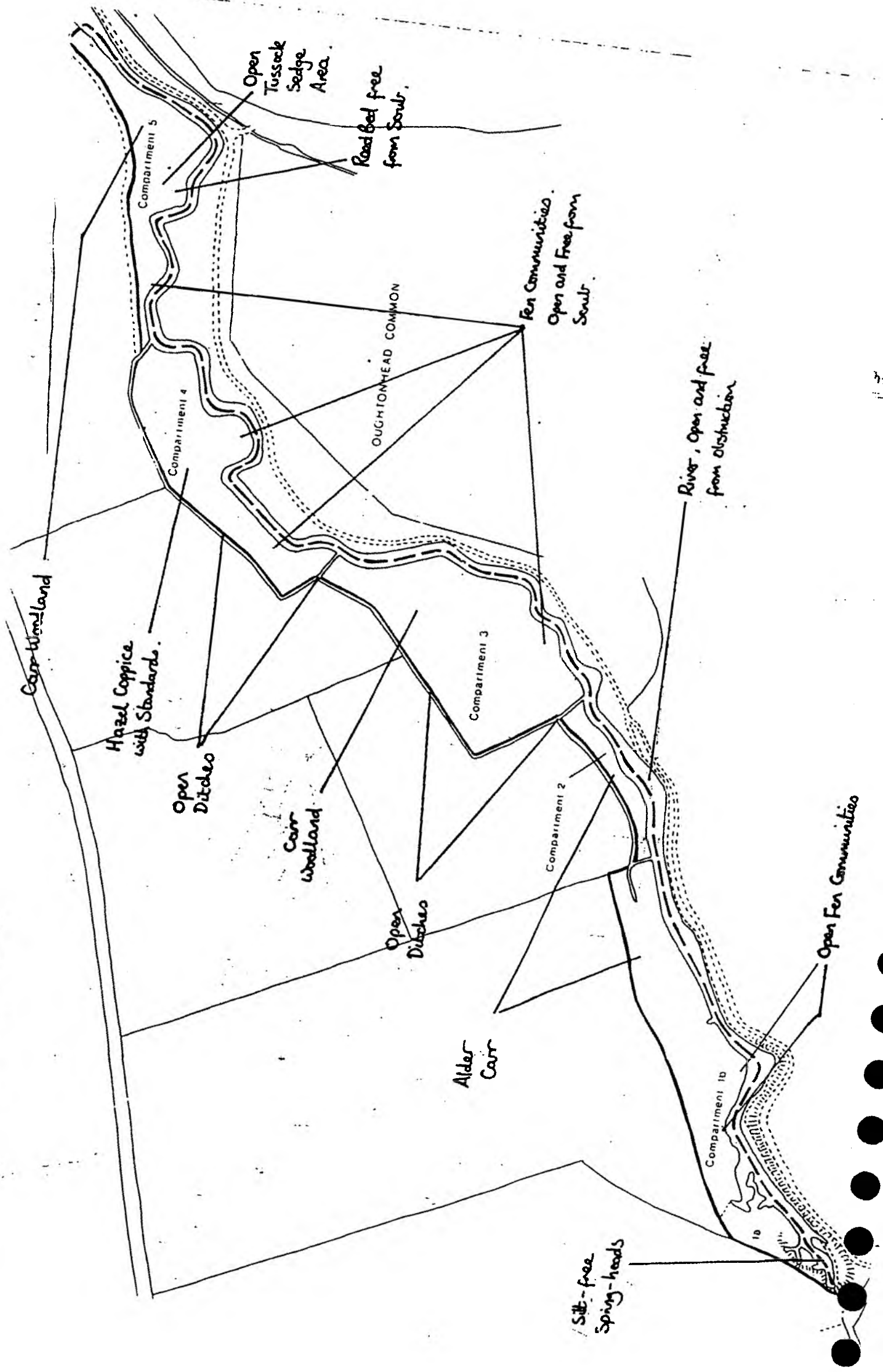
13
"

3.2.1 Five year work programme

| Project code | Project title | 1993 | 1994 | Year | 1996 | 1997 |
|--------------|---------------------------|------|------|-----------|------|------|
| | | 1 | 2 | 1995 3 | 4 | 5 |
| MH57 | Clear ditches | * | * | | | |
| MH52 | Clear scrub | * | * | * | | |
| MH52/65 | Remove overhanging trees | * | * | * | * | * |
| MH53 | Cut tall fen vegetation | | | * | * | * |
| RF03 | Monitor fen vegetation | * | * | * | * | * |
| MH05 | Non-intervention/woodland | * | * | * | * | * |
| MH00 | Coppice hazel | * | * | * | * | * |
| MH02 | Thin birch/ash standards | * | * | * | * | * |
| MH64 | Clear waterweed | | * | | * | |
| MH00 | Coppice riverbank trees | * | * | * | * | * |
| MH64/69 | Remove trees from river | * | * | * | * | * |
| MH53 | Cut reed and rake | | | * | * | * |
| ME30 | Board up spring head | * | | | | |
| M150 | New signs | * | | | | |
| ME00 | Motorbike barriers | | * | | | |



1/1/11 L. Oughton Head : Desired Habitat



MA 3

Light Head Management

Class from Tussock Sedge Area

Compartment 5

New Sign

Cut and Rake Roadbed

Clear scrub and remove overhanging trees from fen areas. Treat birch stumps. Cut and rake fen areas on rotation. Coppice riverbank trees on 10-15 year rotation.

DOUGHTONHEAD COMMON

Compartment 4

Compartment 3

Compartment 2

New Sign

Keep river free from obstruction. Clear trees and waterweed as necessary.

Coppice riverbank trees on 10-15 year rotation.

Remove Overhanging Trees from Rannart Fen.

Great Notolike Pine Carina

New Sign

Replace Boarding Around Springheads

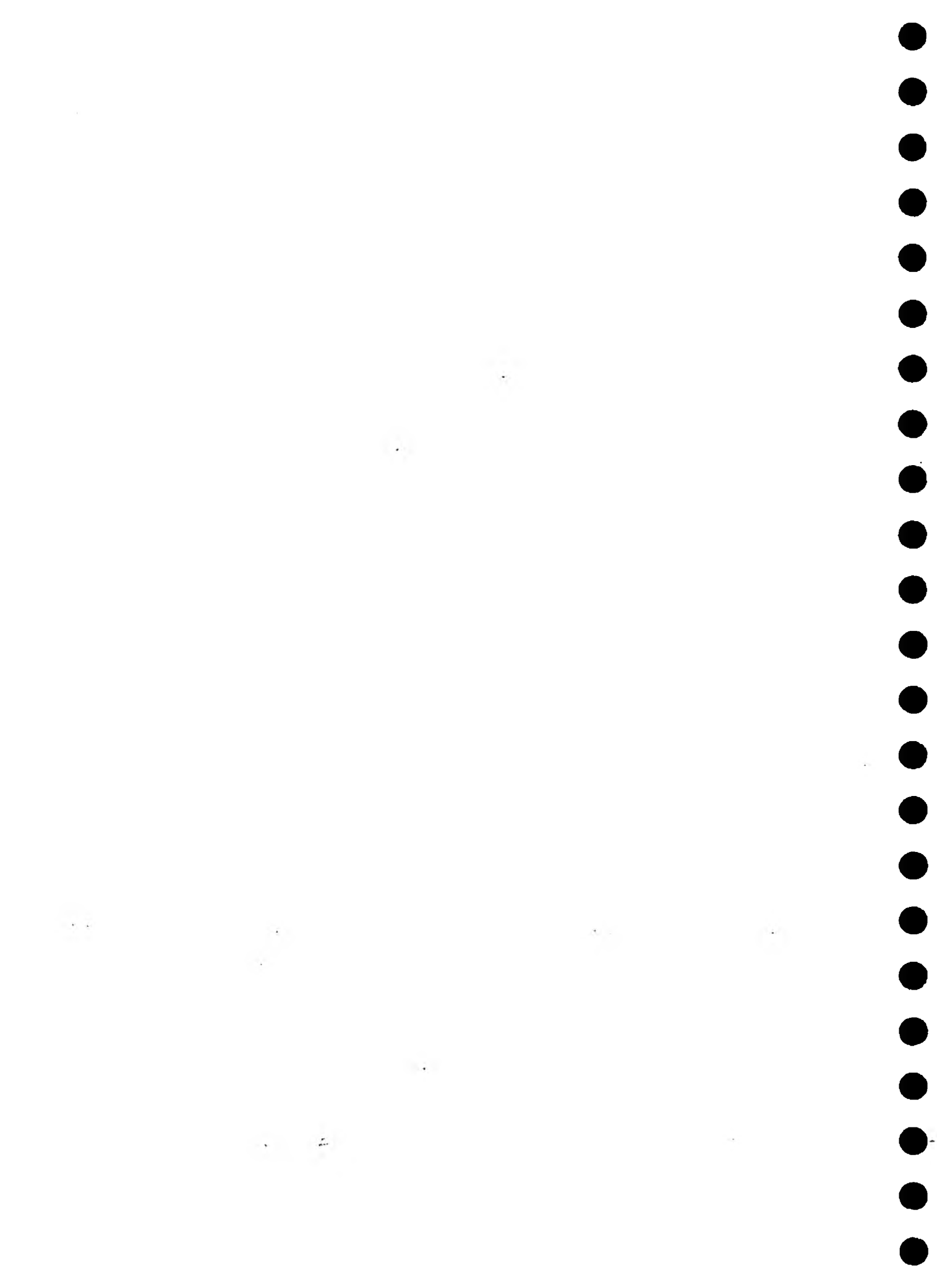
Allow Natural Succession to Continue.

Clear and Maintain Ditches. Remove Overhanging Trees.

Allow Natural Succession to Continue.

Clear and Maintain Ditches. Remove Overhanging Trees.

Coppice Hazel on Rotation. Thin birch/ash standards.

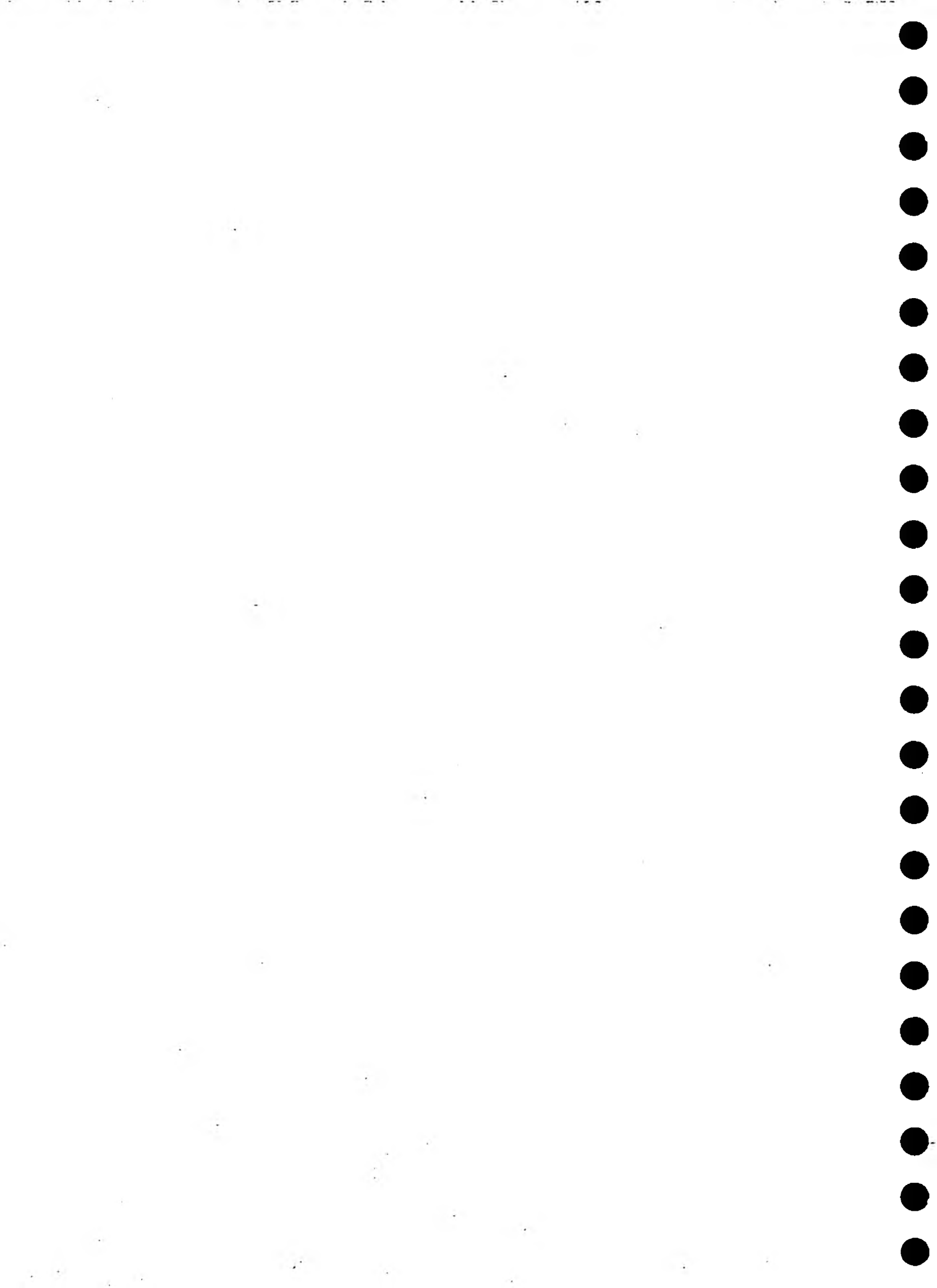


OUGHTON HEAD NATURE RESERVE

Management Plan

Draft

HERTFORDSHIRE & MIDDLESEX TRUST FOR
NATURE CONSERVATION LTD.



A5 Description

a) Topography

The five compartments of mixed wet woodland form a belt of varying width along the north bank of the River Oughton from its source at Oughton Head to a point just short of West Mill. The river lies in a shallow valley north west of Hitchin, and the Reserve approaches to within 300 yards of its boundary at West Mill Estate. At Oughton Head, the river is bordered on the opposite side by a natural bank with trees, which is replaced downstream for the rest of the Reserve's length by the more or less open ground of Oughton Head Common.

b) Geology

At the Reserve's western end, Middle Chalk outcrops at the surface, from which arise the springs of the River Oughton from a band of impervious chalk: Melbourn Rock. The springs rise at about 200 feet O.D..

For the rest of the length of the Reserve, the Middle Chalk is overlain by a Pleistocene deposit of chalky boulder clay. Beyond the Reserve, at West Mill, a glacial deposit of gravels has been laid down across the mouth of the valley, causing an obstructed flow in the river in the past, and resulting in various alluvial deposits forming a lens in the valley bottom. Most of the Reserve is founded upon these alluvial deposits, mainly a dark sedge peat ranging up to 3 feet in depth.

c) Soils

Soils through most of the Reserve's length derive from the peat deposits and tend towards acidity, although this is modified by the chalk water of the river, producing a fen soil type. At Oughton Head, on the site of an old cottage, soils appear to be a more basic light loam over the chalk.

PART A GENERAL INFORMATION

5. Description of Site

(d) Flora

Botanical History

Fen vegetation has existed on the site for a very long time, although past management would have modified this considerably. It is known that "osiers" were grown, as well as willows for fencing. The "osiers" were almost certainly Salix purpurea, which survives. Other parts were a developing fen carr by 1920, although the eastern portion was a bog. This once supported several Rarts. rarities, notably Grass of Parnassus (Parnassia palustris) and Bog Cotton (Eriophorum angustifolium). Water Violet (Hottonia palustris) was once a feature of the drainage ditches which bisect the fen.

'Cricket-bat Willows' (probably the existing Salix alba x fragilis) were planted about 1920 on the former bog, as well as elsewhere, while the western willow groves have given way to Alder swamp (Alnus glutinosa).

Present flora

Fen carr of various types has developed on the formerly managed fen. Tussock Sedge (Carex paniculata) in various parts has given way to willow swamp in the central areas, which is in the process of being replaced by Ash (Fraxinus excelsior), Oak (Quercus robur) and Downy Birch (Betula pubescens). The latter predominates in Compartment 3 (see the map), while Ash and Oak form a mixed community with it in Compartment 4. The two western compartments are mostly dominated by Alder carr, which has reached its maximum development, and is being invaded by Sycamore (Acer pseudoplatanus) from planted trees near the spring. The grove by the springs, of man-made origin, also contains White Willow (Salix alba), Wych Elm (Ulmus glabra) and English Elm (Ulmus procera). The latter also exist as a probably planted grove in Compartment 3.

The Reserve is very varied in botanical interest. It contains some examples of the locally rare Almond Willow (Salix pentandra), and its shrub and ground vegetation are also varied, including Carex riparia, Carex paniculata, the ferns Dryopteris carthusiana, D. dilatata, D. filix-mas and Athyrium filix-femina, the shrubs Viburnum opulus and V. lantana, Ribes nigrum, R. rubrum, and R. uva-cris, and other flowering plants such as Ranunculus flammula, Caltha palustris, Lythrum salicaria and Galium odoratum (a rare find on a peaty soil).

A5 (Continued)

d) Flora

Botanical History

Fen vegetation has existed on the site for a very long time, although past management would have modified this considerably. It is known that "osiers" were grown, as well as willows for fencing. The "osiers" were almost certainly Salix purpurea, which survives. Other parts were a developing fen carr by 1920, although the eastern portion was a bog. This once supported several rare species, notably Grass of Parnassus (Parnassia palustris) and Bog Cotton (Eriophorum angustifolium). Water Violet (Hottonia palustris) was once a feature of the drainage ditches which bisect the fen. *x H. rubra*

'Cricket-bat Willows' (probably the existing Salix alba x fragilis) were planted about 1920 on the former bog, as well as elsewhere, while the western willow groves have given way to Alder swamp (Alnus glutinosa).

Present flora

Fen carr of various types has developed on the formerly managed fen. Tussock Sedge (*Carex* paniculata) in various parts has given way to willow swamp in the central areas, which is in the process of being replaced by Ash (Fraxinus excelsior), Oak (Quercus robur) and Downy Birch (Betula pubescens). The latter predominates in Compartment 3 (see the map), while Ash and Oak form a mixed community with it in Compartment 4. The two western compartments are mostly dominated by Alder carr, which has reached its maximum development, and is being invaded by Sycamore from planted trees near the springs. The grove by the springs, of man-made origin, also contains White Willow (Salix alba), Wych Elm (Ulmus glabra) and English Elm (Ulmus procera). The latter also exists as a probably planted grove in Compartment 3. *(Acer pseudoplatanus)*

The Reserve is very varied in botanical interest. It contains some examples of the locally rare Almond Willow (Salix pentandra), and its shrub and ground vegetation are also varied, including Carex riparia, Carex paniculata, the ferns Dryopteris carthusiana, D. dilatata, D. filix-mas and Athyrium filix-femina, the shrubs Viburnum opulus and V. lantana, Ribes nigrum, R. rubrum, and R. uva-crispa, and other flowering plants such as Ranunculus flammula, Caltha palustris, Lythrum salicaria and Galium odoratum (a rare find on a peaty soil).

Overall species diversity indices have been established for the Compartments 3, 4 and 5, using the two different formulae:

- | | |
|---|--|
| i) $\frac{\text{no. spp. recorded in survey}}{\text{log. of total contacts}}$ | ii) $\frac{\text{no. spp. recorded in compartment}}{\text{log of total contacts}}$ |
|---|--|

The results show a very rich flora:

- | | |
|--------------------------|--------------------------|
| i) Compartment 3: 7.36 | ii) Compartment 3: 19.06 |
| ii) Compartment 4: 10.18 | Compartment 4: 24.23 |
| Compartment 5: 10.25 | Compartment 5: 22.88 |

comparing with a species rich marsh at Norton Common, using formula(ii) which gave 20.52; with 8.14 for ash/oak woodland.

e) Fauna

Mammals

The Reserve acts as a sanctuary for local wild-life, especially from the very open country north of the Reserve. Fox, Muntjac Deer, Hare and perhaps Badger are all visitors. Rabbits occur sparsely. Little is known of other mammal populations but Common Shrew, Bank Vole and Water Vole have been recorded, along with bats of unknown species and Mole. Stoat, Weasel, Harvest Mouse, Wood Mouse have been recorded from the neighbouring Common, and Pigmy Shrew from Oughton Head. There is an unconfirmed report of Otter having bred at the Springs about 1930, and there have been further possible sightings recently.

Birds

Records from the past usually refer to Oughton Head as inclusive of both the Common and the north bank woodlands, as well as the springs. The area as a whole has a total list of 121 species. Many of these represent rarities which have been recorded in the past, notably Smew, Great Snipe, Bittern, Little Bittern, Red-breasted Merganser, Spotted Crake, Oystercatcher, Bearded Tit. Of these, many no doubt occurred on the Common or in the river, but several other species of rarity have been known to occur in the Reserve more recently, particularly Little Crake in the 1950's, Wryneck, Great Grey Shrike, Sparrowhawk. Water Rail winters regularly, and Kingfishers may breed. Red-backed Shrike, Snow Bunting, Gull Bunting, Long-eared and Short-eared Owls and possibly Buzzard have all been reported from the Common recently.

The Reserve contains a good breeding population of common birds, as well as some less common species, like Stock Dove, Goldcrest, Spotted Flycatcher, Garden Warbler, Chiffchaff, Turtle Dove and Redpoll. Mallard and Moorhen breed beside the river.

Reptiles and Amphibia

The River Oughton is an important breeding area for the Common Toad, and less so for the Common Frog. No Grass Snakes seem to have been recorded since 1895, and there are no other species recorded.

Fish

With present water levels the only species represented in the River Oughton are Three-spined Stickleback, Millers Thumb and a few Rudd or Dace. Common Trout was once a feature of the river, large specimens being caught as far up as the springs. They do not now appear to survive above the mill race, although fry have been found near Oughton Head recently, possibly escapees from the neighbouring Trout Farm. Other species have been introduced in the past, but do not now survive.

A5 (Continued)

e) Fauna (continued)

Insects

Very little recent work has been done on the insects of Oughton Head. Sixteen species of butterfly have been recorded in the area recently, and work on the Caddis-flies has produced a total list of eight species. Dragonflies, Stone-flies, Moths etc. await further study.

Other groups

There are scattered records for other groups such as Crustacea, Arachnids. Much work needs to be done to document these.

Early maps (before 1850) only show trees along the south side of the river at Oughton Head. However, there is a series of watercolour paintings by the father and son Samuel Lucas, dating from about 1820 to at least 1870 which clearly show low scrub in various stages of development at various times of the year along the north bank of the river opposite the Common. Several of these paintings also show management activities along the north bank near the springs: especially one painting about 1850 which shows men clearing sedges and cutting pollarded willows between pools and ditches of water. This kind of managed fen would most probably have been a very long-standing type of management for the area. Surrounding fields are known to have been mostly grazing land early this Century, and willow coppicing and pollarding were still being practiced in 1914 when the farm and the ~~xxx~~ fenland were obtained by the County Council Smallholdings Committee. From about 1924, the practice of cutting osiers and willows for fencing in the 10 acres nearest the Mill was stopped in order to maintain the sporting use of the woodlands. Cutting of poles continued in the rest of the woodland (then known as 'The Sallows'), probably at least until the Second World War.

The small grove at Oughton Head springs occupies the site of a small cottage which was demolished about 1890. There is evidence that there was at one time a small hamlet around the springs, which were closely passed at that time by the public road from Hitchin to Pirton.

Half of the river lies within the ownership of the County Council, and its maintenance originally fell to them. In 1915, it took 2 labourers 12 weeks to clean the river and ditches "around West Mill" and cost £20.12.6. Regular cutting of weed was undertaken. This maintenance was made the responsibility of the tenant in 1922, and presumably gradually fell off as time wore on.

The origin of the fen carr would seem to be aboriginal, despite this active management. The existence of a considerable depth of sedge peat in the shallow valley created by glacial action would suggest a ponding of water following the last glacial period. This retention of fen has no doubt been helped by the construction of the raised millstream for West Mill, which was probably originally built around 1600, and was almost certainly raised in the 19th Century.

Grid Ref.
TL 1 6 6 32

HABITAT: WOODLAND
WET AREAS

Date
1955

V.C.

HEA

RECORDER

Records from TOV SWANSCOW
A Bryophyte Flora of Hampshire

Alt.

LOCALITY OUGHTONHEAD Common

MOSES

| | | | | |
|-----------|-----------|-----------|------------|-----------|
| Acro muti | virt | rufe | osmu | myur |
| Acro cord | arge | schr | rufu | stri |
| cusp | orge | squa | taxi | Lept piri |
| giga | lang | subu | viru | Lept rips |
| sarm | bico | vari | Font anti | Lept smit |
| stra | caes | Dier aspe | anti | Lept flex |
| trif | cana | denu | grac | Leak poly |
| Aloi aloi | capo | unci | squa | Leuc glau |
| ambi | doni | Dier cirr | Funa aite | Leuc sciu |
| rigi | eryt | crispu | fasc | Meas ulig |
| Ambi deal | inel | Dier blyt | hygr | Mniu affi |
| Ambi conf | inte | bonj | much | cinc |
| spru | mild | falc | obtu | cusp |
| Ambi | mura | flag | Grim alpi | horn |
| comp | pallen | fusc | alpi | long |
| serp | pallen | maju | rivu | marg |
| vari | pend | mont | apoc | orth |
| Amph | pseu | scop | deci | pseu |
| lapp | bimu | scot | deci | punc |
| moug | pseu | spur | robu | rugi |
| Andr alpi | ulig | star | doni | bell |
| roth | warn | stri | funa | stel |
| rupe | weig | Diph foli | hart | undu |
| Anoe | Camp lute | Dist capi | laev | Myur iula |
| comp | seri | Dier cyli | mari | Neck comp |
| Anom | Camp | cyli | orbi | cris |
| conc | chry | flex | pate | pumi |
| filii | clod | hete | pulv | font |
| Anom viti | poly | Drep adun | retr | Octo font |
| Anti curt | prot | adun | stri | Oedi grif |
| Arch alte | somm | knel | suba | Olig herc |
| Arct fulv | stel | exan | torq | Onco vire |
| Atri cris | Camp atro | flui | tric | wahl |
| undu | brev | lyco | Gymn | Orth line |
| Aula andr | flex | revo | aeru | Orth ingr |
| palu | frag | late | calc | rufe |
| Barb conv | intr | revo | recu | Orth affi |
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| conv | seti | unci | Hedw cili | cupu |
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| fall | schw | cili | Hete hete | lyel |
| ferr | subu | rhab | flac | pule |
| horn | Camp saxi | stre | hete | rivu |
| nith | Cera purp | vulg | Homa tric | rupe |
| recu | coni | Ento orth | Hook luce | spec |
| refi | purp | Ephe recu | Hgt fluv | spru |
| revo | Cinc stys | terr | tena | stra |
| rigi | Cinc font | minu | Hygr dila | stri |
| spad | muer | terr | eugy | tene |
| toph | Cirr cras | Epip toze | luri | Phas curv |
| ungu | pili | Euci vert | ochr | cusp |
| vine | Clim dend | Eurh alop | Hylo brev | floc |
| hall | Cono tetr | comm | sple | Phil calc |
| ibby | Crat | mega | umbr | capo |
| nomi | comm | mura | Hyoc flag | font |
| cris | comm | prae | Hypon call | seri |
| pomi | fulc | stok | cupr | Phys pate |
| Blin acut | filii | ripa | cupr | Phys pyri |
| Brac tric | Cryp hete | schl | eric | Plag zier |
| Brac | Cien moli | spac | fil | Plag oede |
| glar | conu | stri | lacu | Plag curv |
| mild | mull | swar | resu | dent |
| plum | Cyno brun | adla | sect | dent |
| popu | jenn | bryo | hamu | obtu |
| | Desm | cras | impo | late |
| | conv | cris | pati | pili |
| | Dich pell | curn | Isop depr | plat |
| | flav | exil | eleg | roes |
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| | | | Isot holt | Aucc |
| | | | myos | undu |

Mosses

Salix pentandra

EPHEMEROPTERA

Ephemera vulgata (1930) R. Palmer in 'Hine'
Ephemera danica (1930) R. Palmer
Baetis binovalis (1930) R. Palmer
Baetis scambus (1930) R. Palmer
Baetis sp. (1965) A. Trotman
Cloeon (1965) A. Trotman
Ephemera ignita (1965) A. Trotman

TRICHOPTERA

Anabolia nervosa (1930) R. Palmer
(1965) A. Trotman
Halesus digitatus (1925) R. Palmer
Chaetopteryx villosa (1930) R. Palmer
Sericistoma personatum (1922) R. Palmer
Sericistoma sp. (1965) A. Trotman
Leptocerus aterrimus (1930) R. Palmer
Limnophilus spp (1965) A. Trotman
Limnophilus lanatus R. Palmer
(1969) P. Taylor
Agapetus spp (1965) A. Trotman
Apatidea fimbriata (1969) P. Taylor
Potmophylax cingulatus (1969) P. Taylor
Agraylea sp. (1965) A. Trotman
Stenophylax spp. (1965) A. Trotman

| | |
|-------|---------|
| Date | V.C. No |
| 1960- | 20 |

V.C. HEATS

Alt.

RECORDER : 1965 A. Norman Peat: disturbed peat deposit yielded
1966 M.P. Kerney old shells 1978
1970 T. James et al

Grid Ref.

LOCALITY : OUGHTON HEAD

MOLLUSCA

| | | | |
|---------------|----------------|---------------|------|
| 1 Theod flu | 60 Verti sub | 121 Arion lus | |
| 2 Vivip viv | 61 ppy | 122 ate | |
| 3 con | 62 gen | 123a ate | 1966 |
| 4 Valve cri | 63 mou | 123 ruf | |
| 5 mac | 64 lil | 124 Euroa ful | 1966 |
| 6 pis | 65 alp | 125 Vitre cry | |
| 7 Pomat cle | 66 ang | 125a cry | 1966 |
| 8 Acicu fus | 67 Pupil mus | 126 con | |
| 9 Hydro ven | 68 Lauri eyl | 127 Oxych dra | 1966 |
| 10 ulv | 69 ang | 128 sal | 1966 |
| 11 Pseud con | 70 Abida sec | 129 ali | 1966 |
| 12 Potam jen | 71 Asant sse | 130 hel | 1966 |
| 13 Bythi sch | 72 lam | 131 Actin red | 1966 |
| 14 Bitby ten | 73 Vatto sse | 132 pur | 1966 |
| 15 lea | 74 pul | 133 ali | 1966 |
| 16 Ansim gra | 75 sse | 134 Zonit exc | 1966 |
| 17a min | 76 Ena mon | 135 nit | |
| 18 min | 77 sse | 136 Vitri pol | 1966 |
| 19 Phyti myo | 78 Marpe lam | 137 maj | |
| 20 Lyman sse | 79 Claus bid | 138 pyr | |
| 21 gla | 80 dub | 139 Milax gag | |
| 22 pal | 81 rol | 140 ins | |
| 23 sta | 82 Lacin bip | 141 sow | |
| 24 aur | 83 Bales per | 142 bud | |
| 25 per | 84 Cochl sse | 143 Limax ten | |
| 26 glu | 85 Testa mau | 144 max | |
| 27 Aples hyp | 86 hal | 145 cin | |
| 28 Pyram tur | 87 scu | 146 fla | |
| 29 spp. | 88 Fruti fru | 147 Lehma mar | |
| 30 Plano cor | 89 Helic obv | 148 Agrio agr | |
| 31 Menet dil | 90 Helic lap | 148a agr | 1966 |
| 32 Plano car | 91 Arion sse | 149 sat | |
| 33 pla | 92 Theba pis | 150 car | |
| 34 vortic | 93 Helic sse | 151 lae | |
| 35 vortic | 94 nem | 152 Marga mar | |
| 36 leu | 95 asp | 153 Unio pic | |
| 37 lae | 96 pom | 154 tum | |
| 38 alb | 97 Hygro lim | 155 Anodo cyg | |
| 39 acr | 98 cin | 156 ans | |
| 40 cri | 99 subr | 157 min | |
| 41 sse | 100 sse | 158 Sphae riv | |
| 42 Segme com | 101 his | 159 cor | |
| 43 nit | 102 lib | 160 tra | |
| 44 Acrol lac | 103 subv | 161 lac | |
| 45 Anacyl flu | 104 Monac gra | 162 Pisid amn | |
| 46 Catin arc | 105 car | 163 cas | |
| 47 Succu obl | 106 sse | 164 con | |
| 48 put | 107 Helic cap | 165 sse | 1966 |
| 49 pte | 108 gig | 166 obi | |
| 50 ele | 109 vit | 167 mil | |
| 51 Azeca goo | 110 neg | 168 pte | |
| 52a lub | 111 ita | 169 sub | |
| 53 lubricella | 112 ele | 170 sup | |
| 54 Pyram rup | 113 Cochl acu | 171 hen | |
| 55 Colum ode | 114 Panet ppy | 172 lil | |
| 56 Trunc cyl | 115 Discu rot | 173 hib | |
| 57 bri | 116 Georma mac | 174 nit | |
| 58 Verti pus | 117 Arion int | 175 pul | |
| 59 ani | 118 sse | 176 moi | |
| | 119 sse | 177 ten | |
| | 120 sub | 178 Dreis pol | |

OTHER SPECIES :



OLLGOTTEN HEAD

CRUSTACEA

SPONGILLIDAE

Isopoda Asellus aquaticus 1965 A. Trotman Euphydasia fluviatilis 1965 A.

BRANCHIURA Regulus foliaceus 1 R. Palmer (fish lice)

AMPHIPODA Gammarus spp. 1965 A. Trotman
G. pulex "

AMPHIPODA

Lumbriculus variegatus 1965 A. Trotman

Glossiphonia complanata 1965 "

Helobdella stagnalis "

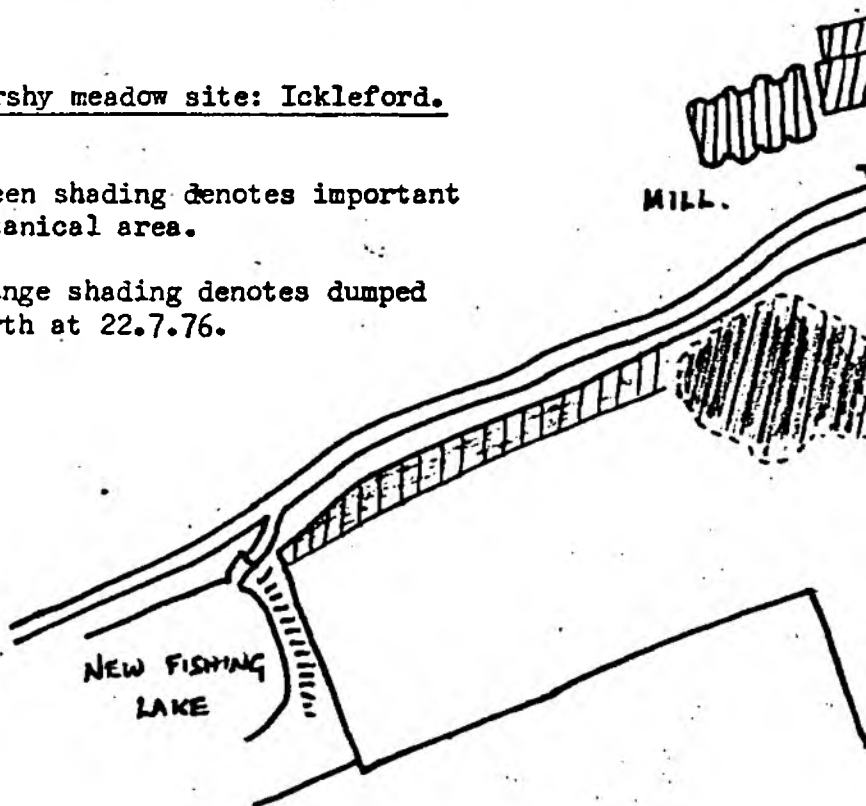
Herpobdella octoculata "

Piscicola geometra "

Marshy meadow site: Ickleford.

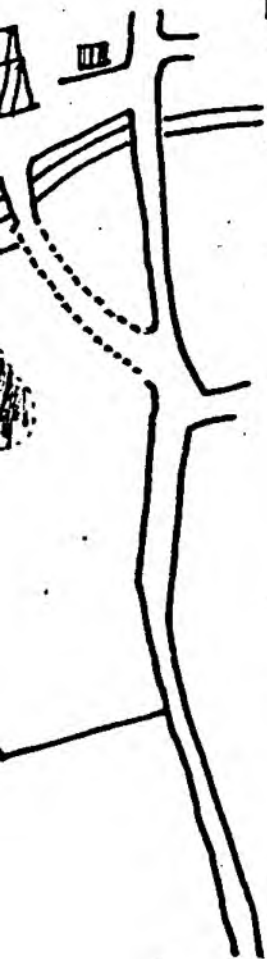
Green shading denotes important botanical area.

Orange shading denotes dumped earth at 22.7.76.



ICKLEFORD

11/029



11/029

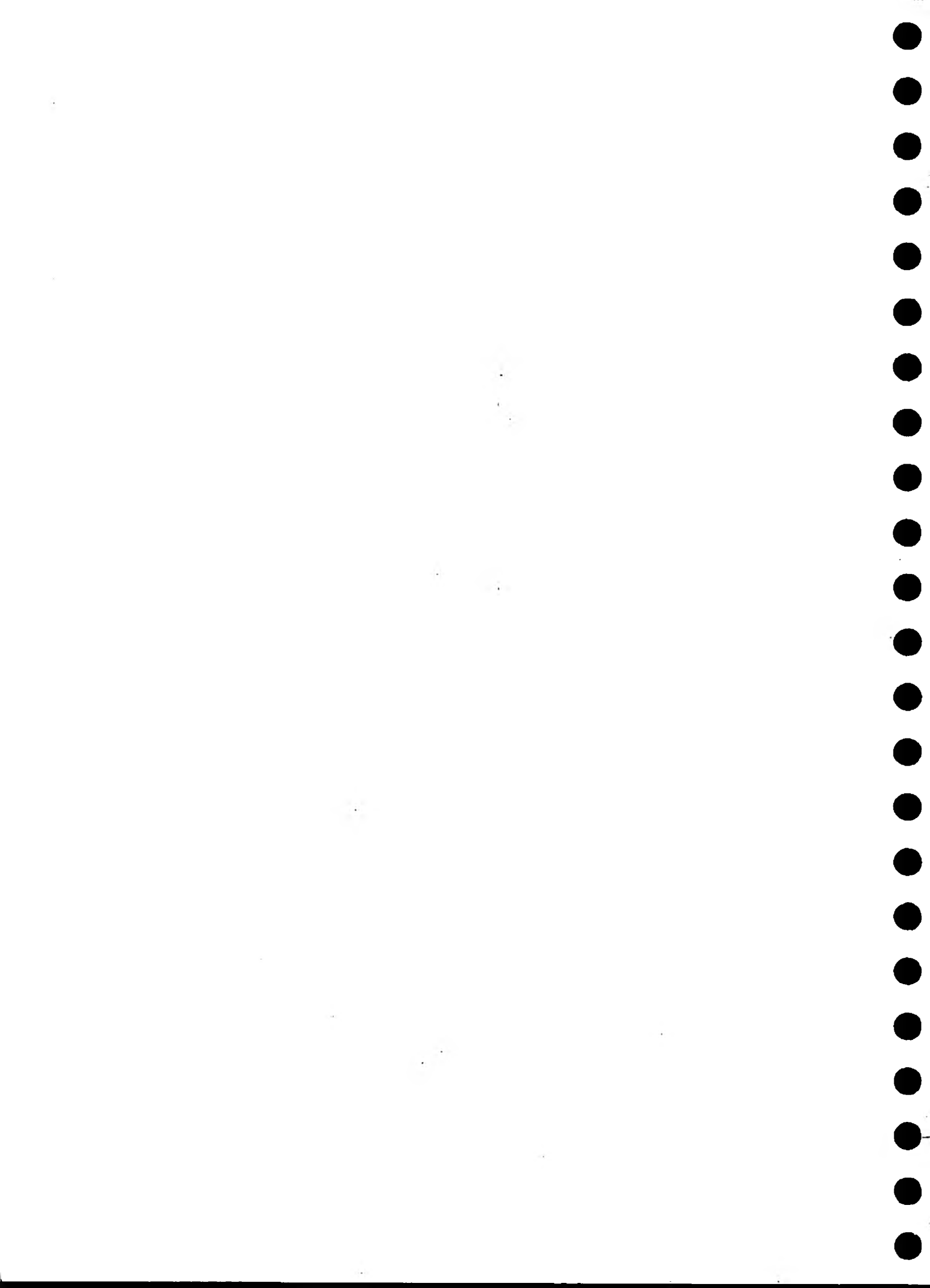
TL 13/V4

| LOCALITY | | | SOUTH EAST | | |
|--------------------------------------|-----------------|----------------|---------------|---------------|----------------|
| Meadow, Bowmans Mill, Kallford | | | Date | V.C. No. | |
| | | | 22-7-76 | 20 | |
| HABITAT | | | Herts. | | |
| Damp riverside meadow on basic soil. | | | Alt. | Code No. | |
| | | | | | |
| 8 Acer cam | 207 Astra dan | 381 Carex dem | 538 Colch aut | 771 Euphu ext | 961 Helic pra |
| 6 Acer pso | 208 gly | 363 distans | 540 Comu mac | 772 hel | 962 pub |
| 8 Acer ant | 211 Athyr gl | 366 divisa | 541 Conop maj | 777 replus | 976 Hierac pil |
| 9 Aethi | 212 Atrip gla | 368 divisa | 544 Convo arv | 783 ang | 979 Hippo com |
| 13 Aciso arv | 214 bas | 369 divulsa | 550 Coron var | 788 neu | 980 Hippo rha |
| 15 Acora cal | 218 lit | 370 ech | 551 Coron did | 801 pso | 981 Hippu vul |
| 18 Adora mos | 218 sab | 371 eld | 552 squ | 804 ros | 984 mol |
| 20 Agrop pod | 220 Avena fat | 373 eri | 553 Coryd cla | 810 Fagus syl | 988 Honke pep |
| 221 Aescu lup | 221 lud | 374 ext | 556 lut | 816 gig | 989 Horda eur |
| 21 Asthu cyn | 224 Baldo ran | 376 flacca | 557 Coryl ave | 834 vul | 991 Horda mar |
| 22 Agris sup | 225 Ballo nig | 381 hir | 569 Crata mon | 835 Foeni vul | 992 mur |
| 23 Agrop odo | 229 Barba vul | 382 bos | 570 oxy | 836 Fraga ana | 993 sec |
| 26 Agrop jun | 231 Belli per | 383 las | 571 Crepi bis | 838 ves | 995 Hetta pal |
| 32 pun | 232 Berbe vul | 387 lep | 572 cap | 839 Frang ain | 996 Humul lup |
| 33 rep | 234 Berul ero | 393 nig | 578 tar | 841 Fraxi exc | 998 Hydro mor |
| 35 Agros can | 235 Beta mar | 397 ova | 588 Cuscu epi | 847 Fumar cap | 999 Hydro vul |
| 36 gig | 240 Betul pub | 398 pal | 589 epitb | 849 mic | 1003 Hyper and |
| 40 ten | 239 ver | 399 pal | 592 Cymba mur | 854 off | 1004 cal |
| 41 Alra car | 241 Biden cer | 400 panicea | 596 Cynog oil | 858 val | 1006 dub |
| 42 Alra pra | 242 Black tri | 401 panicula | 597 Cynos cri | 862 Galeo lut | 1008 elo |
| 46 Aluga rep | 243 Black per | 404 pen | 607 Daphn lau | 863 Galeo ang | 1010 bir autum |
| 57 Alche ves | 244 Blech spi | 405 pil | 620 Daucu car | 867 Dipsa ful | 1011 bum |
| 60 ran | 245 Blyan com | 406 pol | 628 fle | 868 Dipsa ful | 1014 per |
| 62 Allism lan | 248 Eotry lun | 407 pse | 630 Descu sop | 871 Galin par | 1015 pul |
| 63 Allia pla | 249 Brach pin | 408 pul | 634 Desma mar | 872 Galin ang | 1018 Hypoc gla |
| 75 Allia pet | 250 syl | 412 rein | 635 Desma mar | 873 Galin ang | 1022 Iberi ama |
| 75 Allia ura | 251 Brass nap | 413 rip | 636 Desma mar | 874 Galin ang | 1023 Ilex aqu |
| 76 Allia vin | 252 nig | 414 ros | 637 Desma mar | 875 Galin ang | 1030 Iruia con |
| 79 Alopec glo | 253 ole | 419 ser | 640 Digid pur | 876 Galin ang | 1036 Iruis |
| 82 Alopec seq | 254 rap | 421 syl | 641 Digid pur | 877 Galin ang | |
| 82 Alopec gen | 256 Briza med | 424 ves | 642 Dipsa ful | 878 Galin ang | |
| FOLD HERE | | | | | |
| 84 myo | 262 com | 427 Carl vul | 647 pil | 867 spe | 1039 pso |
| 85 pso | 268 lep | 428 Carpi bet | 657 Drose rot | 868 *tet | 1047 Isole set |
| 87 Altha off | 269 *mol | 432 Casta sat | 661 Dryop aus | 871 Galin par | 1048 Jasio mon |
| 97 Ammop are | 270 mol | 433 Catala aqu | 664 *nl | 872 Galin ang | 1050 Juncuacut |
| 98 Anaca pyr | 271 ras | 440 Centa cya | 668 spi | 873 Galin ang | 1054 ort |
| 99 Anaca arv | 273 sec | | | 875 cru | 1057 bul |
| 100 ten | 275 tho | 440 Centa sca | | 877 ere | 1059 *bul |
| 103 Anemo nem | 276 Bryon dlo | 451 Centa min | 670 Eclia vul | 878 her | 1062 com |
| 106 pul | 283 Butom umb | 453 pul | 673 Eleoc aci | 879 *mol | 1063 con |
| 108 Angel | 291 Bakil mar | 456 Centu min | 674 mul | 880 Galin ang | 1067 eff |
| 113 Anisa ste | 292 Calau can | 457 Cepha dam | 675 pal | 881 Galin ang | 1069 ger |
| 117 Anthe arv | 293 epl | 461 Ceras arv | 677 pau | 882 Galin ang | |
| 118 cot | 296 Calam asc | 466 glo | 678 uni | 883 Galin ang | |
| 121 Antho odo | 298 nep | 469 sen | 679 Eleng flu | 884 Galin ang | |
| 123 Anthr neg | 299 int | 472 tet | 681 Elode can | 885 Galin ang | |
| 125 syl | 303 obt | 473 Cerat dem | 682 Elymu are | 886 Galin ang | |
| 128 Anthy vul | 304 sta | 474 Clinen min | 683 Elymu are | 887 Galin ang | |
| 128 Anthy oro | 307 ver | 478 Chner tem | 684 Elymu are | 888 Galin ang | |
| 131 Aphan arv | 308 ver | 479 Chama ang | 685 Elymu are | 889 Galin ang | |
| 132 arv | 309 Callu vul | 477 Chama ang | 686 Elymu are | 890 Galin ang | |
| 133 mlo | 310 Calu pul | 480 Cheli maj | 687 Elymu are | 891 Galin ang | |
| 134 Apium gra | 2248 Calys *sep | 481 Cheno *alb | 688 Elymu are | 892 Galin ang | |
| 135 inn | 311 sep | 484 bon | 689 Elymu are | 893 Galin ang | |
| 137 nod | 312 mol | 487 sc | 690 Elymu are | 894 Galin ang | |
| 142 Arabi tha | 313 syl | 493 pol | 691 Elymu are | 895 Galin ang | |
| 146 Arabi hir | 315 Campa glo | 502 Chrys leu | 692 Elymu are | 896 Galin ang | |
| 150 Arcti agg | 321 rap | 503 par | 693 Elymu are | 897 Galin ang | |
| 151 lap | 320 rapunculo | 504 seg | 694 Elymu are | 898 Galin ang | |
| 152 min | 322 rot | 506 Chrys opp | 695 Elymu are | 899 Galin ang | |
| 153 vul | 323 tra | 509 Cicbo int | 696 Elymu are | 900 Galin ang | |
| 163 Arena lep | 325 Capse bur | 513 Circa lut | 697 Elymu are | 901 Galin ang | |
| 161 *ser | 327 Carda ama | 514 Cirsi aca | 698 Elymu are | 902 Galin ang | |
| 162 ser | 328 fle | 516 dis | 699 Elymu are | 903 Galin ang | |
| 166 Armer mar | 329 hir | 517 eri | 700 Elymu are | 904 Galin ang | |
| 167 Armer rus | 331 pra | 520 pul | 701 Elymu are | 905 Galin ang | |
| 168 Armer ole | 333 Carda dra | 522 vul | 702 Elymu are | 906 Galin ang | |
| 170 Artem abe | 335 Cardu cri | 523 Cladi mar | 703 Elymu are | 907 Galin ang | |
| 172 mar | 337 nut | 525 Clat per | 704 Elymu are | 908 Galin ang | |
| 175 vul | 340 acuta | 528 Clema vit | 705 Elymu are | 909 Galin ang | |
| 176 Arum mas | 342 app | 530 Clino vul | 706 Elymu are | 910 Galin ang | |
| 182 Asper cyn | 344 are | 532 Cocbl ang | 707 Elymu are | 911 Galin ang | |
| 183 odo | 350 bin | 533 dan | 708 Elymu are | 912 Galin ang | |
| 185 Asple adi | 355 car | 535 off | 709 Elymu are | 913 Galin ang | |
| 182 rut | 355 car | 537 Coclo vir | 710 Elymu are | 914 Galin ang | |
| 194 tri | | | 711 Elymu are | 915 Galin ang | |
| 204 Aster tri | 359 car | | 712 Elymu are | 916 Galin ang | |

RIVER PURWELL

General Reference Material

PURWELL MEADOWS MANAGEMENT PLAN



PURWELL MEADOWS MANAGEMENT PLAN

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 - Nature Conservancy Council
 - World Wildlife Fund
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Map : Site map showing compartments.

A. DESCRIPTION

1. General information

1.1 Location and extent

Purwell Meadows lie between the Cambridge Road, Purwell Lane and Chaucer Way, Walsworth, at grid reference TL 200299. The meadows are approximately 24 acres in extent (about 10 ha).

1.2 Tenure

The meadows are owned freehold by North Hertfordshire District Council, and under a grazing tenancy to R. Chennells, Highover Farm.

1.3 Status

The meadows are a proposed Site of Special Scientific Interest, to be designated under the Wildlife and Countryside Act, 1981. The site is also designated in the North Hertfordshire District Plan as a Site of Wildlife Interest (WI 9 - part). The Council has also declared that the site shall be regarded as an open space maintained primarily for the protection of its fauna and flora.

1.4 Access and rights

The public have a right of way over the footpath from the Cambridge Road, across Compartments 5, 2 and 1 to the junction of Willian Road and Purwell Lane. (See map)

Under the grazing tenancy, Mr R. Chennells has a right to graze up to 30 cattle between 1 May and 31 October, inclusive, or as agreed between the Council and himself in the event of adverse ground conditions.

There is no other unrestricted access to the meadows, and general access by organised groups will be by permit from the Council.

1.5 Administrative arrangements and responsibilities

General responsibility for the management of the Meadows rests with the North Hertfordshire District Council, and is vested in the Technical Officer.

Under the grazing tenancy, the grazing tenant is responsible for ensuring the upkeep of fencing.

1. 5 (continued)

Under the provisions of the forthcoming S. S. S. I. designation, it will be the responsibility of the Council to consult with the Nature Conservancy Council concerning any proposed alteration of the management of the Meadows.

Under terms of grant aid toward the purchase of the site, it is also the responsibility of North Hertfordshire District Council to agree with the Nature Conservancy Council, the Countryside Commission and with the Hertfordshire and Middlesex Trust for Nature Conservation the terms of any management proposals. A condition of grant aid from the World Wildlife Fund is that an annual report on the condition of the site shall be supplied by North Hertfordshire District Council.

2. Description of the site

2. 1 Outline site description

The meadows comprise a complex of formerly separate fields around the course of the River Purwell and its associated mill stream, and a subsidiary stream emanating from springs to the south of the meadows, formerly a commercial watercress bed. The site is bounded by housing to the north-west and north-east, separated from the site by the Cambridge Road and Purwell Lane/Willian Road respectively; by the grounds of North Hertfordshire College of Further Education to the south-west; by the former cress beds and a small disused pasture to the west; and by Chaucer Way and further pastures etc. to the south-east.

The pastures are generally unimproved calcareous grassland over loam and include extensive areas of marshy ground, with associated springs, and some scrub. A buried sewer bisects the western part of the site.

2. 2 Geology and geomorphology

The site is generally underlain by chalky boulder clay, with evidence of post-glacial gravels to the south of the area, and of alluvium across much of the north-west of the site. Chalk itself, here the strata known generally as 'Middle Chalk', is probably fairly close to the surface.

2. 3 Hydrology

The meadows have three main sources of water. The River Purwell itself, which meanders across the site, arises largely from springs at Purwell Ninesprings near the Wymondley Road, although some flow is received from the Ippollitts Brook, which has its source from Little Almshoe near St Ippollitts. The original course of the River Purwell, through Purwell Mill, has been stopped up at the mill since the 1960's, and flow in this channel is mainly owing to run-off from the nearby housing estate at Chaucer Way, by way of the silt trap adjacent to the meadows to the south-east. The main flow of the River Purwell now follows the course of the mill-stream, which is probably a partially man-made channel, constructed or straightened in the 16th century. The two courses join in the centre of the meadows.

The second source of water consists of the flow from the water cress beds springs adjacent to the meadows, and arising beside the boundary of the meadows with the College grounds. These springs flow north to join the River Purwell just short of its exit from the meadows near the Cambridge Road. The course of this stream has been artificially widened to accommodate the cress beds since 1920.

The third source of water consists of the periodic rising of water in the bowl of what was probably the original 'Shad (=Chad) Well', situated in the southern half of the former Lammas grazing, Compartment 7. This spring source may have been considerably stronger than it now is, and its surrounding banks suggest the possibility of some former structure to impound the flow, although there is no recent evidence of disturbance.

Water also rises at various points throughout the wetter parts of the site, creating strongly calcareous spring conditions in the marsh areas, especially in the Spring.

All these springs appear to be associated with the outcropping of the Melbourn Rock at approximately 200 feet Ordnance Datum, although the Shadwell spring rises at about 10 feet below this level.

2. 4 Soils

No detailed analysis of the soils has been undertaken. However, it would appear that alluvium comprises the main soil type across the northern half of the site, with calcareous loam over the boulder clay elsewhere. The presence of gravels is noted to the south of Shadwell spring, and here the soil may be correspondingly better drained.

2. 5 Botanical composition

2. 5. 1 Outline of plant communities and habitats

The predominant plant communities of the site consist of neutral to slightly acidic marshy grassland; neutral to somewhat calcareous dry unimproved grassland; scattered areas of scrub, largely hawthorn and blackthorn; calcareous spring pools with associated sedge marsh; dry to slightly damp semi-improved secondary grassland; riparian marsh; submerged and emergent riparian communities associated with the River Purwell and its side channels; and scattered mature trees, mainly ash. There were formerly probably planted elms along the eastern boundary.

Characterisation of the main plant communities is rendered difficult, owing to the site's topographical complexity. However, detailed study by a member of the public, Mr F. Bentley, of part of the area has enabled definitive statements to be made about the most important areas.

2. 5. 2 DETAILED BOTANICAL DESCRIPTION BY COMPARTMENT

Compartment 1. Great Garrat's

This raised area consists of secondary calcareous grassland developed over previously ploughed land. The marginal bank to the area, visible in the field, has some botanical importance, with the presence of Spiny Rest-harrow (*Ononis spinosa*). The grassland is otherwise relatively species-poor, and has had some herbicidal treatment against buttercups. The belt of former elms along the east side has succumbed to elm disease.

Compartment 2 Little Garrats.

The area consists of a somewhat finer turf of probably only semi-improved ancient calcareous grassland. It was meadow in 1818. It is still somewhat species-poor. An area of marshy ground alongside the river is dominated by Hard Rush (Juncus inflexus). The area has been subjected to herbicide treatment.

Compartment 3 Sulters.

The grassland is neutral to fairly calcareous semi-improved grassland, developed over former ploughed land. The turf here is much finer than in Compartment 1, with a greater frequency of Red Fescue etc., indicating a greater age for the grassland. It was plough in 1818.

Compartment 4 Gilberts.

The area grades from Compartment 3, separated from it by the line of the surface drain from Purwell Lane, which empties into the River Purwell by way of a culvert. The habitat is fairly calcareous semi-improved dry grassland, with some representation of chalk grassland species, including Salad Burnet (Poterium sanguisorba) and Burnet Saxifrage (Pimpinella saxifraga). The grassland is, however, of secondary origin, having been plough in 1818.

Compartment 5 Pelters

This area consists of a mosaic of marsh, dominated by Juncus inflexus, and damp, unimproved neutral grassland. The marsh is generally fairly species-poor, except for a small area near the River Purwell which supports a stand of Bistort (Polygonum bistorta) and other species. The dry grassland is relatively species-poor, especially that part which has been recently disturbed by the laying of a sewer.

Compartment 6 Shadwells (north end).

This consists of the main area of neutral to slightly acidic marsh, which varies in dampness and alkalinity from one part to another. It is ancient, probably primary, unimproved pasture, and is variously dominated by communities of rushes, Juncus subnodulosus in calcareous areas near the watercress beds, Juncus inflexus in areas nearer the course of the River Purwell. There are small drier areas, which support species-rich grassland, including Quaking Grass (Briza media) and stands of Meadow Saxifrage (Saxifraga granulata). The more calcareous marsh supports Southern Marsh Orchid (Dactylorhiza majalis ssp. praetermissa), Marsh Valerian (Valeriana dioica), various sedges (Carex spp.), Fen Bedstraw (Galium uliginosum) and Marsh Horsetail (Equisetum palustre), while the less calcareous area tends to have a higher proportion of Juncus articulatus and other flora including Lysimachia nummularia. One or two small pools have aquatic flora, including Water Speedwell (Veronica anagallis-aquatica), and there are scattered small hawthorn bushes on drier areas. The boundary with the former watercress beds consists of a planted line of young willows, apparently Salix daphnoides ssp. acutifolia. The line of the sewer, laid in 1972, unfortunately bisects the calcareous marsh area, where it has replaced the former marshland community with a species-poor community, dominated by Rye Grass (Lolium perenne), clovers (Trifolium repens and pratense) and the odd stand of Hard Rush.

Compartment 7 Shadwells (south end).

This section of the ancient Lammas meadow is a fairly well-defined area, separated from Compartment 6 generally by an obvious bank of irregular outline. In general, the habitat consists of a variable dry calcareous to neutral unimproved grassland, very uneven, surrounding a unique spring pool and associated calcareous marsh. The dry grassland exists on low banks, some of which also support stands of scrub, mainly hawthorn, but with some blackthorn. There are also scattered old hawthorn trees of some age, and a few ash trees by the line of the River Purwell. The sewer again crosses the area, but does not affect much of the important grassland habitat.

The dry grassland is species rich, with Downy Oat-grass (Helictotrichon pubescens), Quaking Grass, Yellow Oat (Trisetum flavescens) and Small Timothy Grass (Phleum bertolonii), and supporting a wide range of other plants, including one or two characteristic usually of chalk grassland, notably Milkwort (Polygala vulgaris), Stemless Thistle (Cirsium acaulon), Small Scabious (Scabiosa columbaria), Harebell (Campanula roundifolia) and Cowslip (Primula veris), although many of these are very limited.

The spring pool area, which varies in level of inundation, supports a rich and varied aquatic and marsh flora, including Tussock Sedge (Carex paniculata), Bottle Sedge (C. rostrata) (the only site in Hertfordshire), Marsh Willowherb (Epilobium palstre) and Tubular Water Dropwort (Oenanthe fistulosa), all of which are uncommon to rare locally.

The banks around the area also generally support a fine show of Meadow Saxifrage and Spiny Rest-harrow.

Compartment 8 Mungees

Similar in nature and origin to Compartments 6 and 7, this narrow area varies from neutral marsh, dominated by Juncus inflexus through thorn scrub to dry neutral grassland. It has not been studied in as great depth as have the other Lammas areas, but appears to be somewhat less species-rich. The flora of the marsh areas includes species like Bog Stitchwort (Stellaria alsine) and Creeping Jenny (Lysimachia nummularia) which would suggest a rather more acid soil.

River communities

The River Purwell's main flow stems from the chalk and is therefore generally calcareous. However, road run-off from neighbouring housing estates no doubt introduces various pollutants, and there is evidence of a somewhat impoverished aquatic flora. The bed is largely gravel and silt, the latter particularly in the sluggish old course of the river, now superceded by the main flow in the mill-stream. This system therefore has a tendency to indicate a neutral water quality, although no detailed study has been carried out. The flora of the mill stream and main flow of the Purwell includes Water Crowfoot (Ranunculus penicillatus ssp. calcareus), Branched Bur-reed (Sparganium erectum), Canadian Pond-weed (Elodea canadensis), Fool's Watercress (Apium nodiflorum) and Water Starwort (Callitriche stagnalis). The old river course also had a little Water Parsnip (Berula erecta) and Blunt-fruited Water Starwort (Callitriche obtusangula), which are rather less common. River margin flora is generally varied and rich, owing to cattle grazing, and includes a little Water Plantain (Alisma plantago-aquatica) and has had Water Whorl-grass (Catabrosa aquatica) among other species.

2.5.3 Rare plant species

The total flora of the Purwell Meadows complex is well in excess of 260 species of higher plant. Several of these are of greater or lesser rarity, either in a local context or more widely. In particular, species associated with the marshland environment are particularly rare, and constitute some of the more important aspects of the site.

Regionally rare species (found in less than 10 ten-kilometre National Grid squares in East Anglia). None present (although Carex rostrata is very infrequent in the region, except in northern Norfolk).

Species rare in Hertfordshire (found in less than 10 sites in the County).
Marsh Willow-herb (Epilobium palustre) - found here only in the area of the spring in Compartment 7, with one or two isolated sites elsewhere.
Tubular Water Drop-wort (Oenanthe fistulosa). Restricted to the spring pool.
Carex rostrata - again mainly restricted to the spring pool area, with two locations in Compartment 6.

Species locally rare (found in less than fifty sites in Hertfordshire or particularly scarce in the Hitchin area)

Water Horsetail (Equisetum fluviatile) - restricted to the south end of Compartment 6.

Adder's-tongue Fern (Ophioglossum vulgatum) - Compartment 7.

Marsh Marigold (Caltha palustris) - limited to Compartment 6.

Lesser Spearwort (Ranunculus flammula) - local in Compartments 6 and 7.

Milkwort (Polygala vulgaris) - limited to Compartment 7.

Spiny Rest-harrow (Ononis spinosa) - widespread except on the poorest areas.

Meadow Saxifrage (Saxifraga granulata) - widespread in Compartments 6, 7

Blunt-flowered Water-starwort (Callitriche obtusangula). - frequent in the old river course, occasional in the mill stream.

Water Parsnip (Berula erecta) - occasional in Compartments 6 and 7 and in the rivers.

Marsh Woundwort (Stachys palustris) - only recorded by the river in Compartment 6.

Fen Bedstraw (Galium uliginosum) - widespread in marsh areas of Compartments 6, 7 and 8.

Marsh Valerian (Valeriana dioica) - restricted to Compartments 6 and 7.

Marsh Ragwort (Senecio aquaticus) - scattered in Compartment 6.

Blunt-flowered Rush (Juncus subnodulosus) - widespread in Compartments 6, 7 and parts of 8.

Bee Orchid (Ophrys apifera) - only recorded once on the site, Comp. 6.

Southern Marsh Orchid (Dactylorhiza majalis ssp. praetermissa) - found throughout the marshes in Compartments 6 and 7.

Bristle Club-rush (Scirpus setaceus) - rare, only in Compartment 6.

Carnation Sedge (Carex panicea) - scattered in marsh areas.

Common Sedge (Carex nigra) - in marsh areas.

Tussock Sedge (Carex paniculata) - especially around the spring pool.

Brown Sedge (Carex disticha) - especially in Compartment 6.

Water Whorl-grass (Catabrosa aquatica) - rare, only by Compartment 6 in the river.

Distant Sedge (Carex distans) - exact distribution unknown.

Marsh Arrow-grass (Triglochin palustre) - exact status unknown.

2.5.4 Mosses and liverworts

The bryophyte flora has been reasonably well-studied by Mr F. Bentley. A total of fifty-two species of moss and six species of liverwort have been identified, including at least five species which could be regarded as rare or relatively uncommon in Hertfordshire: Bryum pseudotriquetrum, Eurhynchium speciosum, Physcomitrium pyriforme, Weissia longifolia var. longifolia and Pohlia prolifera. One other species, Bryum intermedium, if proved correct, would be a new species for Hertfordshire.

The habitats of particular importance for the less common bryophytes include: banks, especially by the river; bare and disturbed soil, especially in the marshy meadow areas; damp grassland; and tree boles and roots. One rare species occurs on one of the fence posts separating the Lammas meadows from the watercress beds. One or two less common species are especially associated with the marshland vegetation of the meadows. Substrates such as bricks and concrete usually support the more common species, although one rare species, Eucladium verticillatum, not included in the above total, has been found on concrete under the old part of the bridge by Cambridge Road, just outside the meadows.

2.5.5 Fungi

The fungus flora of the meadows has also been studied by Mr Bentley and upward of 76 species so far identified. These include many species particularly characteristic of old pasture, as well as several found on decaying wood. The site has an unusually large number of quite or very rare species, including Hygrocybe russocoriacea (the only site known in Hertfordshire).

2.6 Fauna

2.6.1 Birds

Thirty-two species of bird are currently on record for the site, although this is almost certainly an under-estimate. The site is particularly valuable locally for its breeding Reed Buntings, while it provides important feeding for some passage and wintering birds, notably Meadow Pipit, various thrushes and finches. The neighbouring watercress beds are a favourite haunt of the Water Rail, together with Green Sandpipers, Kingfisher, Snipe, Jack Snipe and the occasional Heron, and the meadows are therefore an important adjunct to these aquatic habitats for such species.

2.6.2 Mammals

Little is recorded concerning the small mammal populations, although the site is known to be locally valuable for the Mole. There is a fairly strong population of the Water Vole along the river banks, a species which is becoming increasingly threatened owing to river management works elsewhere.

2.6.3 Amphibians

The spring pool in Compartment 7 is particularly important for its large breeding colony of the Common Frog.

2.6.4 Fish

The River Purwell is known to hold Three-spined Stickleback, and is likely to have other small common species such as the Bullhead, although no records exist.

2.6.5 Insects

No records of insects or other invertebrates have been made, except that thirty species of beetle have been noted, mainly associated with dead vegetation and wood etc. thrown up by the river in a time of spate. With the undisturbed habitats, wide range of food plants and lack of pollution by chemicals, it is likely that the site is exceptionally rich for invertebrates.

2.7 Land-use history

The Court Leete and View of Frankpledge of the Manor of Hitchin, 21st October 1819, gives full details of the Commons of Hitchin and their uses. In this document, the area known as Shadwells and Mungees are identified as Lammas Meadows (Compartments 6, 7 and 8). These pastures were in private ownership, but had rights of common pasture for cattle and sheep as follows:

"The Homage find that the occupier of every ancient messuage or cottage within the Hamlet of Walsworth hath a right to turn and depasture on the commonable land thereof... two cows and a bullock or yearling cow calf... upon the Lammas ground in Walsworth upon and from Old Lammas-day (13th August) until Old Lady Day (6th April). That no person hath a right to common or turn any sheep upon the Lammas ground of Walsworth between Old Lammas-day and the last day of November."

From this, it is evident that for these two areas at least, common pasture of livestock during the winter was practised, probably at least from medieval times until the beginning of the last century.

The place-names shown on an 18th Century estate plan of the estates of the Whitehurst family, in Herts County Record Office, dated 1767, give some clue that the main Lammas Meadow (Compartments 6 and 7) was a site of some antiquity. The name 'Shadwell' is related to 'Cadwell', and refers to the Anglo-Saxon saint of wells and springs, St Chad. It is possible that the site has some early significance.

The same map shows the remainder of site divided into five other fields: Pelters, Great and Little Garrats, Sulters and Gilberts, each enclosed by hedges. The age of these enclosures is unknown, but probably at least Tudor, and quite possibly much earlier. By 1818, when the town of Hitchin was surveyed by W. Merrett, these five fields had been reduced to three: Compartments 2 and 5; Compartment 1; and Compartments 3 and 4. Papers in the Wilshire Collection at Herts. Record Office give these the names Ship Close, Walkers Close and Gilberts. The 1818 map and survey also indicate that the last two fields were then under arable cultivation, and it is possible that all five of the 18th Century fields east of the river have at one time or another been cultivated.

Purwell Mill is of at least 18th Century date, but a mill is known to have been on the site since about the 16th Century at least. The construction of the mill stream would probably date from at least this time. Water flow through the mill along the course of the old River Purwell has ceased to operate, following the stopping up of the mill race about 1970.

The neighbouring watercress beds appear to have been widened out from the previously existing stream and spring source in about the 1920's. Before this time, the stream and spring were an integral part of the meadowland, and included in the 18th Century area of Lammas meadow, Shadwells. Watercress has not been cultivated here for about ten years.

Since the cessation of Lammas winter grazing, when the meadows would have been cut for hay in summer, there are no accurate records available for the grazing pattern of the meadows. Summer grazing by tenants has been in operation for many years, although a period without grazing in the early 1970's led to some extra scrub growth.

Finally, a sewer was laid across Compartments 5, 6 and 7 in 1972, resulting in dry ground conditions in former marsh areas. This has also encouraged access across the river from the footpath, increasing disturbance, as well as having opened a gap in the west boundary of the site adjacent to the neighbouring college grounds, allowing a through passage.

2.8 Amenity

The public have access to the site by way of a footpath between Cambridge Road and the end of Purwell Lane.

The site is also frequently used by local people for walking and dog-exercising, although such use is not encouraged, owing to likely conflict with the grazing tenancy.

In general, the site is regarded as an important green space between the housing of Walsworth and the edge of Hitchin, in conjunction with the neighbouring fields to the south-east.

The site is also used informally by pupils from local schools for study purposes, and very occasionally by college students. Use by local people for natural history study is regular but limited to a few individuals.

2.9 Recent developments

A suggestion was made in 1980 that Compartment 1 be given over to use as allotments. This idea was rejected on the grounds that such a use would be detrimental to the long-term survival of the grazing regime as a whole.

The sale of the meadows in 1983 threatened to bring about either the development of the land for some kind of building, or its piece-meal use for horse-grazing, neither of which uses would have been compatible with the site's conservation interest.

B. MANAGEMENT PRINCIPLES

3. Evaluation of the site

3.1 General site evaluation

The meadows are regarded as of County importance as an example of generally unimproved calcareous marsh and pasture on alluvium, and are shortly (1984) to be scheduled in this respect as a Site of Special Scientific Interest under the Wildlife & Countryside Act, 1981.

3.2 Evaluation of specific features

3.2.1 Geology/geomorphology

No detailed assessment of the geology exists. However, the site has some local interest in that it provides an example of alluvial deposition over the chalk. It is also on the eastern edge of the Hitchin Gap buried tunnel-valley peri-glacial complex of deposits, and it is likely that the area could be of some importance for understanding the local topography associated with this feature.

3.2.2 Hydrology

The hydrological features outlined in 2.3 above are of considerable local importance, as relatively undisturbed, natural formations. This applies particularly to the spring pool and other seepages in Compartments 6 and 7. The existence of undisturbed, natural river bank formations is also of local rarity, owing to modern river management methods elsewhere.

3.2.3 Botany

The most important plant communities are the ancient, undisturbed grasslands and marshlands in Compartments 6, 7 and 8. The damp calcareous grassland community with Blunt-flowered Rush (Juncus subnodulosus), Marsh Valerian (Valeriana dioica), Devil's-bit Scabious (Succisa pratensis), and Meadow Saxifrage (Saxifraga granulata) is of some considerable rarity nationally, representing the 'Neutral Grassland, type 9' of 'A Nature Conservation Review'. It is almost certainly the best remaining site of its kind in Hertfordshire. However, the site was not considered homogeneous and large enough to warrant Grade 1 S. S. S. I. status as a nationally important site by the Nature Conservancy Council.

Many individual species are of special importance on a County scale. The sedge Carex rostrata is only known from this site, while others listed in ch. 2.5.3 are of great local rarity. The richness of the bryophyte and fungus floras also warrants attention.

3.2.4 Fauna

The information so far gathered indicate that the site is of at least local importance for its wetland and wintering bird communities, and for its breeding community of frogs. Data on invertebrates is not available to give any meaningful assessment.

3.3 Evaluation for amenity

The site is locally important as a green space between the urban development of Walsworth and the edge of Hitchin. While it is not a recognised recreation area, its use by local people by way of the footpath and on a less formal basis as an attractive place to walk in are important aspects for the local community. It also has some considerable potential as an educational resource, given sensitive and moderate use, both as an example of a rural landscape in close proximity to the town, and for more specific ecological and landscape studies. Such use, however, is limited by the necessity to retain the traditional management with cattle grazing, and therefore amenity use will depend on the balance between these two aspects being maintained.

4. Trends affecting the site

4.1 Ecological trends

Without moderate management by cattle grazing, the area would rapidly revert through rank marsh and rough grassland to thick hawthorn, blackthorn and other scrub, eventually becoming probably ash woodland. Such a succession would totally remove its present, long-established plant communities.

Summer grazing needs to be moderate in order to maintain the existing diversity of the grassland communities. Many species present are susceptible to overgrazing, and it is therefore essential that grazing is carefully monitored and controlled.

In any plant community, there is a tendency for species to be successively replaced by others in general abundance. The exact nature of this 'turn over' of species is not well understood. There is also a tendency in an isolated area such as this for rare species to become extinct. Several species known to have occurred earlier this century have already done so, particularly: Red Rattle (Pedicularis palustris) and possibly Green-winged Orchid (Orchis morio).

4.2 Man-induced trends

Apart from changes which might be brought about by changes in grazing practices, mentioned above, man's activities have had the greatest effect on the various habitats in the meadows.

The most important trend is for increased public pressure on the sensitive marshland communities, brought about by access being gained from the neighbouring college grounds. This takes the form of trampling, dumping, and some limited pollution from e. g. dogs.

The laying of a sewer across parts of the marsh area has also had the serious effect of changing the plant community from its former species-rich calcareous marshland type to the species-poor, drier ground of today. The tendency for this ground to recover some of its former flora will continue, but it is unlikely that the former community will ever completely return, owing to the change in soil characteristics and drainage.

4.3 External developments affecting the site

The development of the Chaucer Way housing estate to the south of the site, and the more recent extension of housing to the west of the college grounds has a direct effect on the site by isolating it further from other farmland. This might make the continued grazing of cattle on the ground less viable, and therefore make the site even more vulnerable to ecological damage.

The increase in surrounding housing also means an increase in the human pressure on the site, owing to trespass on areas formerly free from disturbance.

Development of the housing estates has also had the effect of introducing an increased quantity of road drainage water into the river system of the site, particularly into the former course of the River Purwell, and into the main stream downstream of its confluence with the mill-stream. This water, despite the silt trap installed nearby, carries a higher proportion of pollutants than formerly, and this will have a continuing effect on the marshland and aquatic communities where these come into contact with it. The increased road run-off in times of heavy rain might also have the effect of creating more frequent flash-floods, resulting in flooding of the grassland by potentially pollutant water. This would have a serious effect on the vegetation if it were frequent. So far, little flooding has occurred.

Any changes in management of surrounding land might have an effect on the meadow habitats. However, changes affecting the watercress beds and the adjacent, isolated strip of former meadow by the college (formerly part of Shadwells) would almost certainly directly affect the wildlife interest of the meadows. This also would be the case if ever developments were to occur on the remaining low-grade pastures to the south of the site, as these are now the only direct link between the site and the surrounding open countryside, as well as providing an essential link in the chain of aquatic and marsh communities along the Purwell Valley. Their current derelict state therefore gives cause for concern.

5. Management objectives

5.1 General long-term objectives

The primary objective of management of the site is to retain and enhance the important plant and wildlife communities, namely the damp calcareous pasture, marshland and associated aquatic communities.

A second objective is to maintain and enhance the natural diversity of the secondary calcareous pasture of the site by appropriate management, namely the restriction of use of herbicides or other chemical agents and its continued management as low-grade grazing pasture.

The third main objective is to maintain the natural features of the river and spring sources

The final main objective is to maintain the existing landscape features and amenity of the site, especially the right of way.

5.2 Specific management objectives

Unimproved dry calcareous pasture

The objective with this habitat type, typically on the banks etc. in Comp. 7 and 8, should be to maintain the species-rich grassland turf by moderate grazing. Clearance of scrub should only be carried out if scrub areas are shown to be encroaching on these areas unduly.

Unimproved damp pasture

This occupies most of Compartment 6, parts of Compartment 7 and half of Compartment 8. Management objectives here should be to maintain the existing diversity of plant community, as well as to maintain water levels acceptable to this habitat type. Light to moderate cattle grazing is the acceptable management method. If dominance of rushes (*Juncus* species) becomes a problem, grazing pressures should be reduced and perhaps withdrawn for a year, in conjunction with a cut of the areas in mid to late summer.

Secondary calcareous grassland

The aim with all such areas, namely Compartments 1-5 and the re-seeded area above the pipeline in Compartments 6 and 7, should be the encouragement of the re-establishment of species-rich permanent turf. This may slowly re-appear by colonisation from undisturbed areas. However, control of some plant species, such as buttercups (*Ranunculus* species) and Creeping Thistle (*Cirsium arvense*) may be necessary. This, however, should only be done by manual cutting, not by application of herbicides, as the latter only has the effect of impoverishing the species composition of the turf and disturbing further the plant community.

Scrub

The small areas of scrub (hawthorn, blackthorn and some bramble) are of local interest, and provide habitat for wildlife. The aim for these areas should be to maintain the existing extent of cover, but not to allow it to extend to an appreciable amount, and certainly not to extend into areas of species-rich turf.

Trees

The few ash trees found by the river are natural growth, and should be retained. One or two replacement trees could be encouraged if necessary alongside the river to replace ageing trees in future.

Elms along the Purwell Lane boundary have almost all been removed. An immediate aim should be the replacement of these trees with native species compatible with the site. These might include ash, field maple and perhaps oak. Similar replacement is needed along the western boundary with the college grounds.

River

The river and mill-stream courses suffer from periodic blockage by rubbish or debris washed down by storms. It should be a continual objective to retain a free flow in the main river course at all times, both from a habitat point of view and for drainage purposes, and to endeavour to maintain a free flow in the much-reduced old river course in the same way. As the river system is largely fairly natural, it should also be a prime objective to retain the natural features of the river system, namely the riffles and pools characteristic of such systems, along with the irregular banks and neighbouring shallows characteristic of grazed river margins.

It should also be a prime objective to endeavour to keep the water quality through the reserve as high as possible. The current river system takes a high level of its flow in some seasons from road and estate run-off, involving oil and rubber pollution. It should be an aim of management to ensure that at least no more such pollution is introduced to the water system, either within the reserve or upstream of the reserve. If possible, steps should be taken to try and reduce the existing pollution levels by ensuring periodic cleaning of the neighbouring silt trap, and possible installation of further traps on open discharges.

Spring sources and pools

The spring pool in Compartment 7 is the most important single feature in the site. Its water supply is sporadic, providing unique habitat characteristics. It should be a first priority to retain this feature without impairment. The old drainage channel which exists between the pool and river course should remain uncleared to retain water at its present level. Cattle grazing across the pool should be retained unless deep water conditions make this impossible in any season.

The neighbouring water cress bed spring source is outside the control of the Council, but it should remain an objective to try and ensure that any use of that land should be compatible with the status of the adjoining reserve. If it is possible, it should also be an objective to acquire this spring area and its adjoining land, and to re-incorporate it into the grazing meadow by restoring natural river banks where possible.

5.3 Objectives of amenity management

The general objectives for management of public amenity of the site will rest on the maintenance of public access by way of the right of way. Although no formal recognition of a public right of access to the rest of the site will be given, it is not expected that restrictions will be imposed on casual use, especially of the northern side, by the public, as long as this use remains at a low level and is not detrimental to stock grazing.

Use by school groups for educational purposes should be accepted in general, subject to a limit to the numbers of parties involved at any one time, and to a restriction on unlimited collecting for study purposes.

It should also be the objective of management to educate the general public as to the value of the site and its significance, and in order to further this, production of suitable publications should be put in hand.

6. Constraints on management

6.1 Legal constraints

S. S. S. I. designation

It is the declared intention of the Nature Conservancy Council to schedule the site as a Site of Special Scientific Interest under the Wildlife & Countryside Act, 1981. Although formal notification of this has not (1984) been received, it is the intention of the North Hertfordshire District Council to proceed as if this notification had been received.

Conditions of grant aid for purchase by the Countryside Commission

Apart from the detailed standard conditions for grant aid laid down by the Commission (see Appendix 1), the Commission has also specified the following three conditions:

- i) that casual public access along the northern edge of the site should not be stopped.
- ii) that detailed consultations should be held with the Museums Services Keeper of Natural History or an appropriate conservation body (e. g. Nature Conservancy Council or Hertfordshire & Middlesex Trust for Nature Conservation) on any changes needed to the grazing regime and any other proposed management measures.
- iii) that the aim of promoting the restoration of former species diversity in areas of disturbed secondary grassland should be carried out by correct grazing and/or mowing regimes, and not by the use of fertilisers or herbicides, or by the artificial diversification of species through habitat diversification or by introductions.

Conditions of grant aid for purchase by the Nature Conservancy Council

The standard conditions of grant aid for purchase of nature reserves is attached in Appendix 1.

Conditions of grant aid for purchase by the World Wildlife Fund

- i) Any publicity relating to the land purchased shall include acknowledgement of WWF's support.
- ii) Until advised to the contrary by WWF, annual reports on the land in question must be submitted to WWF giving up-to-date information on features of ecological interest, e. g. breeding success of birds and plant surveys, and general information such as the number of visitors and visiting arrangements.
- iii) Within six months of the completion of the purchase, a suitable notice shall be erected on the site at a point visible from the main entrance indicating financial support from WWF, and shall be maintained thereafter.

Constraints of public access

The public right of way across the northern part of the site is for pedestrians only. Management of the grazing may not interfere with this path.

Other constraints

If the neighbouring watercress bed is maintained as a commercial operation, the North Herts District Council is under an obligation to the owner of the beds not to allow pollution of the watercourse, following EEC regulations concerning the production of watercress.

Although the site was formerly a Lammas grazing common, all common rights have ceased to exist, and the site is not a registered Common.

6.2 Obligations

North Hertfordshire District Council is under an obligation to maintain fencing of the site adjacent to Purwell Lane, Chaucer Way and Cambridge Road. Maintenance of this fencing is allocated along with the grazing rights to the grazing tenant.

Repair of the fencing alongside the North Herts College grounds is the responsibility of Hertfordshire County Council.

Upkeep of the fencing by the watercress beds on the west side of the site would appear to be the responsibility of the owner of the cress beds.

C MANAGEMENT OPERATIONS

7. Management Work

7.1 Management projects

1. Grassland management

Bearing in mind the objectives outlined in Section 5 above, management of the grassland areas shall be by maintaining a regime of summer grazing between the dates of 1 May and 31 October inclusive. Grazing shall be by a maximum of 30 cattle, and in adverse ground conditions, grazing shall be withdrawn by agreement between the grazing tenant and North Hertfordshire District Council, as required, if damage to the grazing is found to occur.

In addition to the grazing regime, if necessary, control of undesirable species, namely buttercups (Ranunculus species), thistles (Cirsium and Carduus species) and rushes (Juncus species) may be carried out by manual cutting only. Such 'topping' is best carried out in July, both to have greatest effect on the species concerned, and to avoid damage to any breeding birds. Such cutting shall only be carried out by machine across Compartments 1-5 inclusive, and along the raised area of the pipeline across Compartment 6. Cutting of such plants in the wetter areas of Compartments 6 and 7 should only be done by hand if necessary, to avoid damage to the marshland flora by compaction from vehicles or machines.

2. Scrub management

It should only be necessary to cut or remove scrub if such growth is found to be spreading into further areas of grassland, especially around the spring pool in Compartment 7. Cattle grazing should otherwise be used to control growth of blackthorn etc.

3. Tree maintenance and planting

Maintenance of the existing trees alongside the river is important, and should involve periodic attention to any damaged branches, removal of snags etc.

Following the removal of all remaining dead elms, a programme of planting alongside the grounds of the North Herts College, and alongside Purwell Lane should be implemented. This will need the provision of appropriate native tree species, especially ash and field maple, with some oaks, especially on the gravels at the south-western end of the site adjoining the college grounds.

Encouragement of any occasional sapling ash from existing stock by the river should be carried out. If none are available, planting of one or two trees, with adequate protection from stock, may be needed, but should only be carried out in appropriate sites, away from botanically rich areas.

4. Water-course management

The river below its confluence with the mill-stream, along with the mill-stream itself, should be maintained by manual removal of obstructions if necessary, to give a free flow.

The old river course above its confluence with the mill-stream no longer has a strong flow, but should nevertheless have periodic removal of debris, especially wood, to maintain clean water conditions.

The spring pool in Compartment 7 should not need specific management if grazing is maintained at a reasonable level.

Periodic cleaning of the silt trap adjacent to Compartment 8 should be regarded as necessary to maintain adequate water quality in the old river course.

5. Estate management

General management of fencing shall be carried out by the grazing tenant, in agreement with North Herts District Council. Such fencing should take into account the public amenity of the site. In particular fencing alongside Cambridge Road and Chaucer Way should be maintained as stock-proof post and rail fencing. It should also be ensured that replacement or repaired fencing should be of sufficient standard, and should not be a hazard to members of the public.

Stiles at the public entrances should also be maintained and inspected.

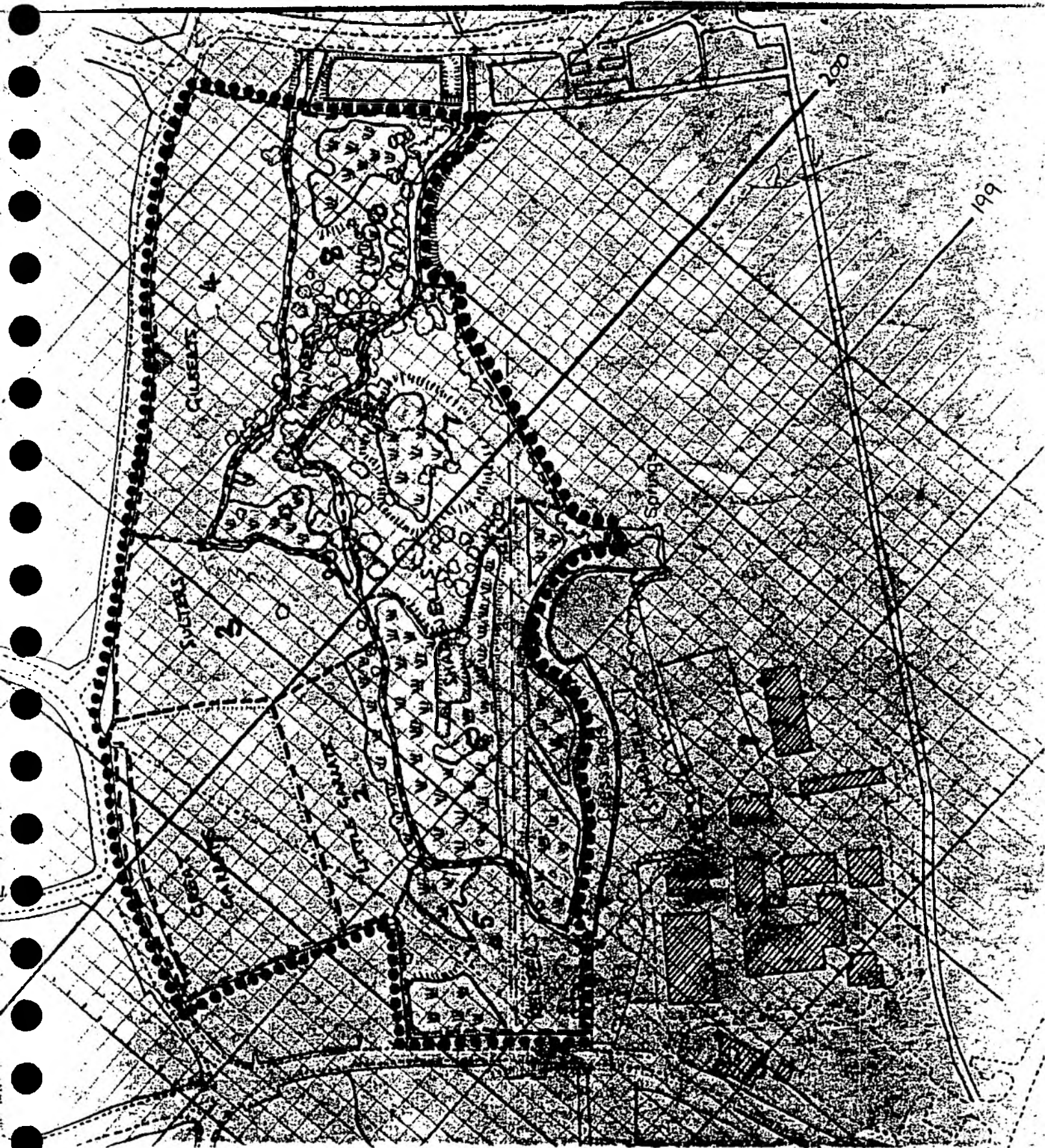
The noticeboards at either entrance should be maintained by repair or application of varnish as required.

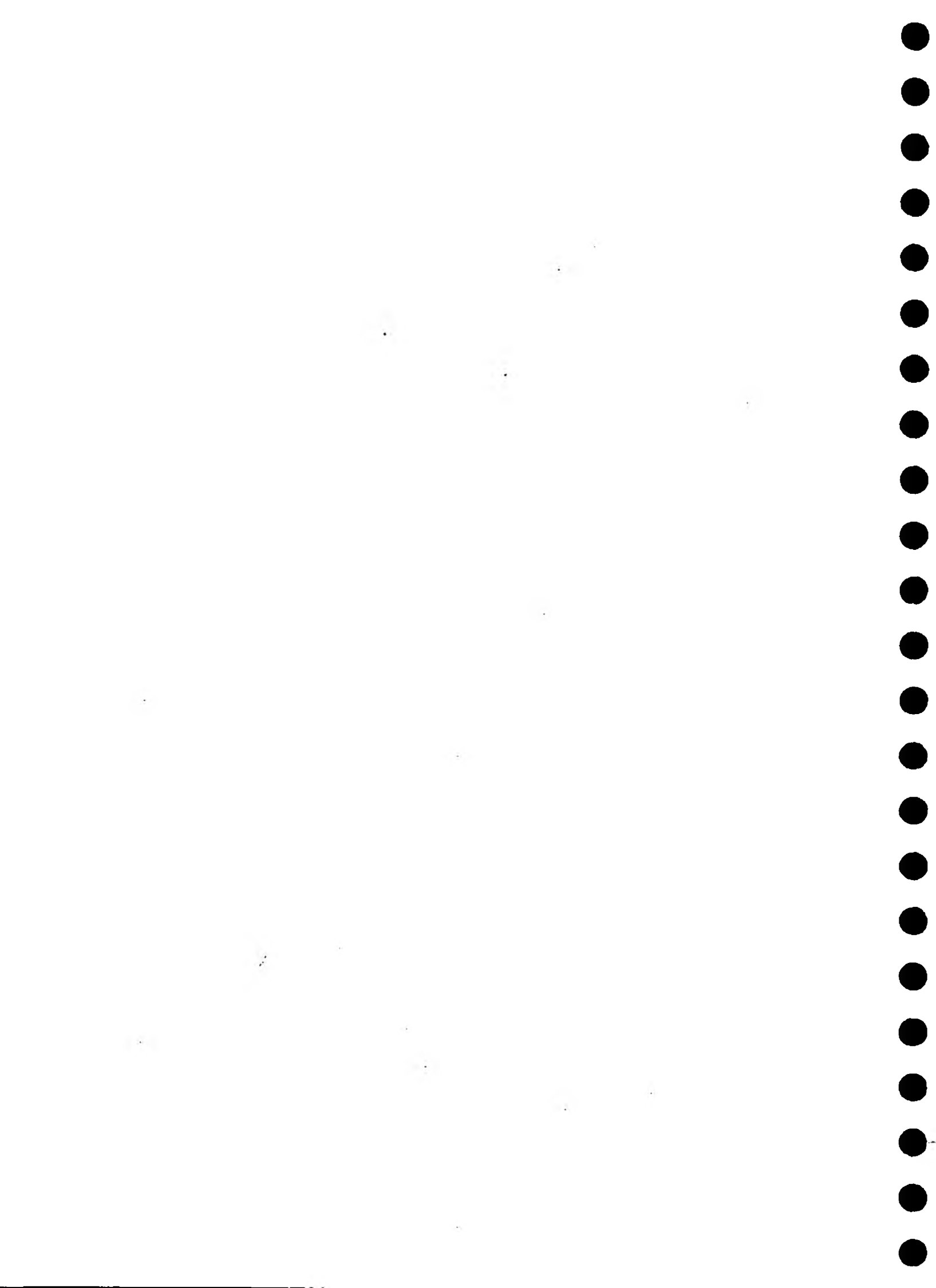
Endeavours should be made to strengthen and maintain the fencing in common with the grounds of the North Herts. College, to reduce access along the south side of the river.

6. Education/publications

The establishment of a formal arrangement for the issuing of permits for school or college parties should be carried out, and appropriate institutions informed of the arrangements and restrictions. This could be done through the Museums Service.

Publication of a short information guide to the site could also be put in hand by the Museums Service at an early opportunity.





PURWELL MEADOWS, HITCHIN: OUTLINE MANAGEMENT PROPOSALS

1. Introductory

Purwell Meadows lie in the valley of the River Purwell, Hitchin (TL 200298). The site is a proposed Site of Special Scientific Interest, pending notification under the Wildlife and Countryside Act. It is also scheduled by North Hertfordshire District Council as part of a "Site of High Wildlife Interest" in the District Plan. Formerly in private ownership, the site was purchased by North Hertfordshire District Council on 3rd March 1983, with grant aid from the Nature Conservancy Council, Countryside Commission, and World Wildlife Fund, in order to protect it from possible adverse development.

Under the terms of grant aid, and in accordance with the requirements of management of a prospective Site of Special Scientific Interest, it is the intention of North Hertfordshire District Council to manage the meadows primarily in the interests of wildlife conservation, while bearing in mind the site's general amenity value.

2. Outline of site characteristics and management history

The meadows (see attached map) comprise a complex of formerly separate fields around the courses of the River Purwell, the mill stream derived from Purwell Mill upstream, and a subsidiary stream emanating from springs on the south side of the site, formerly a commercial watercress bed. The site is bounded by housing to the north-west and north-east, by North Hertfordshire College grounds and playing fields to the south-west, and by a road and other pastures to the south-east. A small strip of land, formerly part of the meadow, but now separated from it by the watercress beds, is not in the site under consideration.

The general habitat characteristics of the site consist of mainly damp calcareous pasture developed over loam lying on glacial boulder clay and chalk. The different fields comprising the present site have had very different histories, some of which is recorded in historical records, and which illuminate differences in botanical composition.

2.1 Great Garrats: an area of secondary grassland re-developed over a formerly ploughed field. The grassland here is relatively species-poor. A public footpath crosses the area.

2.2 Little Garrats: In 1818 recorded as an enclosed hay meadow. It is an area of unimproved ancient grassland, with some marsh alongside the river. It is relatively species-poor, and is crossed by the public right of way.

2.3 Sulters and 2.4 Gilberts: These were formerly two separate fields, recorded as ploughed in 1818. The grassland is dry and fairly calcareous, with some marginal wet areas by the river. It is fairly species-poor, but with some areas of interest for chalk flora.

2.5 Pelters This is a small area of unimproved marshy meadow near the Cambridge Road, traversed by the public footpath. It is botanically variable, with some fairly rich areas, especially by the river.

2.6 and 2.7 Shadwells: This is the main area of botanical interest, being the large part of the former Lammas grazing meadows. A small section, also properly part of 'Shadwells' now is separated from it by the watercress beds, and is not in the current site. The habitat is varied, with a large area of marsh dominated by rushes (*Juncus* species) to the north, and an area of uneven, dry hummocks and marshy depressions to the south with seasonal spring pools. Some old thorn scrub and other trees are present in the latter area. The combination of calcareous dry pasture and various wetland habitats is of special interest, supporting a considerable number of unusual species of plant. The common grazing was formerly operated in the winter months, following hay-cutting, but recent management has altered to a summer grazing regime. The area is unlikely ever to have been ploughed.

2.8 Mungees: This is a narrow strip of land with varied marshy pasture and some scrub between the river and the mill stream. It is of considerable botanical and other wildlife interest, and has a similar grazing history to Shadwells.

2.9 River Purwell and Mill Stream: The upper part of the river is now relatively sluggish with much overhanging tree and bush cover. The mill stream currently takes the main river flow and supports a fairly rich aquatic flora and fauna. The river system retains natural features, such as pools and eddies, and is reasonably unpolluted, although road run-off is received from the new estates at Chaucer Way by way of an adjacent silt trap. The neighbouring watercress beds lie outside the present meadow, although formerly consisted of a smaller side stream across the meadow, joining the River Purwell just above the Cambridge Road.

2.10 Pipeline: A sewer which was unfortunately laid across the meadows in 1972/3 has damaged some areas of Shadwells, Mungees and Pulters, resulting in artificially dry areas with re-seeded vegetation and little regeneration of the original marsh.

3. Management proposals

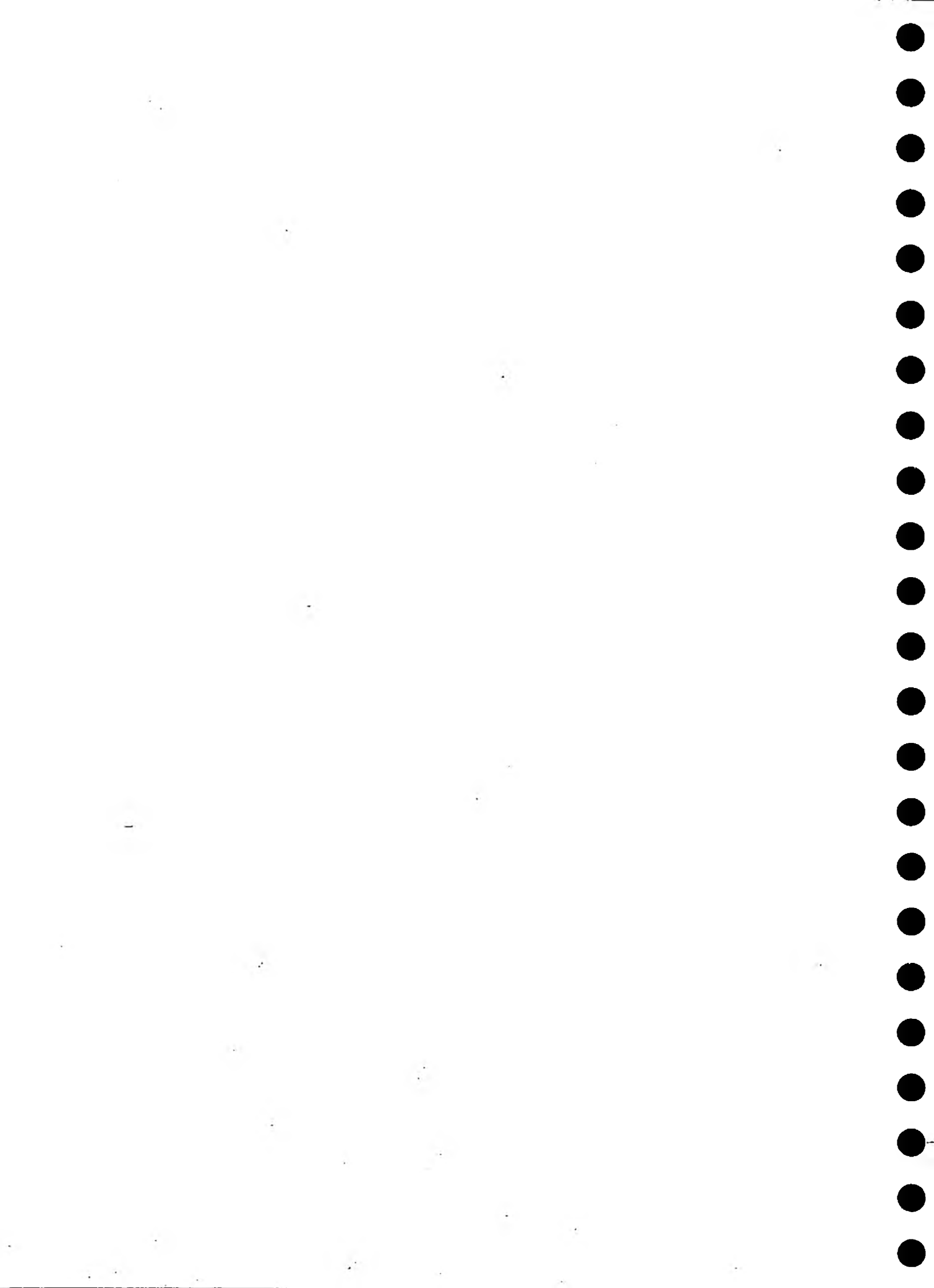
It should be the primary aim of management to maintain the existing diversity of the fauna and flora of the site, and to enhance this interest where possible. The management history of the meadows is not uniform, and has resulted in some areas losing their probable former interest to some extent. However, it should be the aim not only to maintain the remaining botanically rich area of the meadows but also to encourage the re-development of a rich flora on formerly disturbed areas. The previous regime of Lammas grazing after hay cutting is, however, not considered feasible owing to the poor access to large areas of the best parts of the site. As summer grazing has been in operation for a considerable period, it is proposed that this management be maintained, even though some of the formerly-existing species of special interest are known to have disappeared over the last 50 years.

3.1 It is proposed that the grazing regime of the meadows will consist of summer grazing of up to 30 cattle between 1 May and 31 October inclusive, or restricted by agreement between North Hertfordshire District Council and the tenant as necessary in adverse ground conditions.

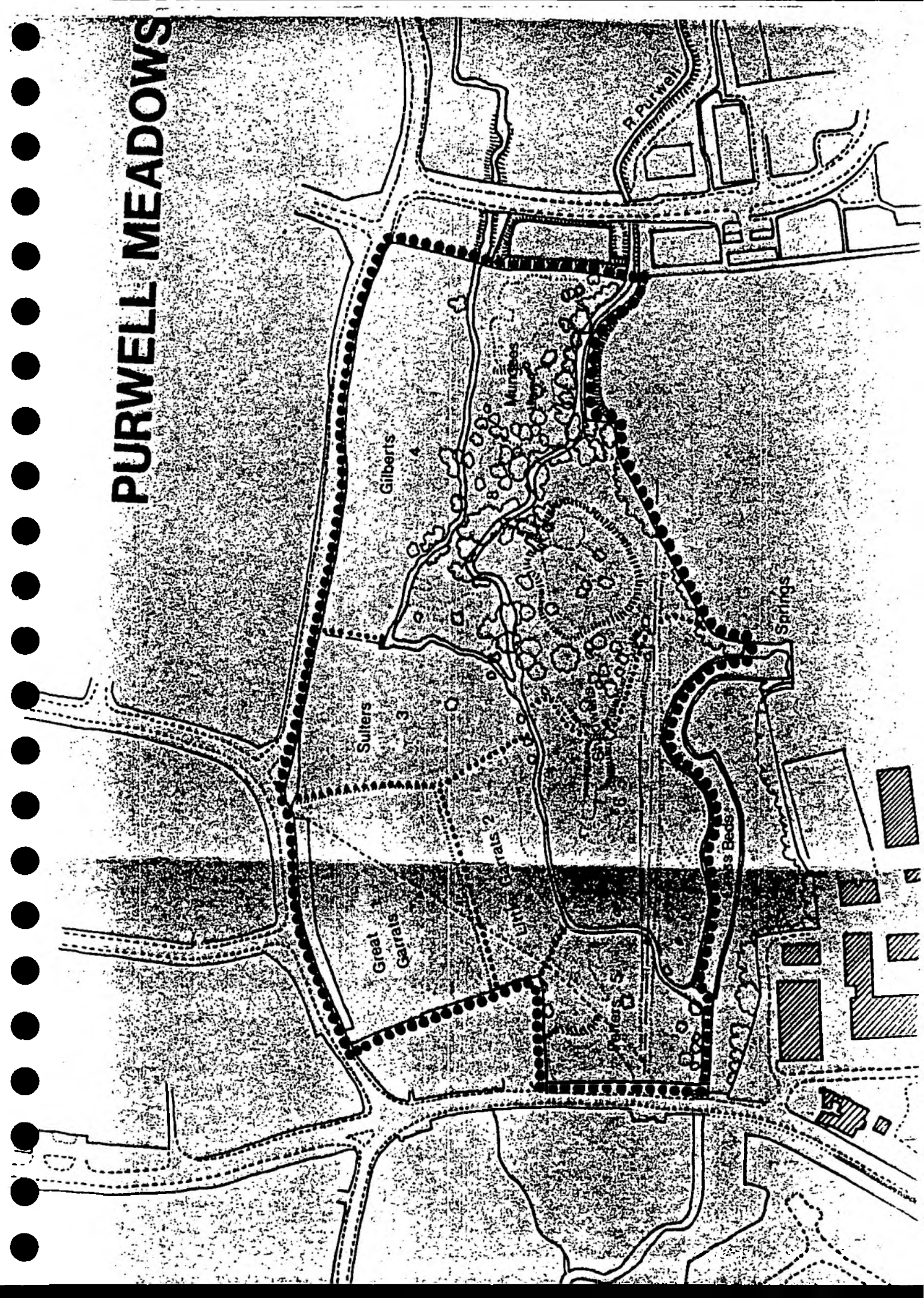
- 3.2 The over-development of thistles, nettles and buttercups (*Ranunculus* species) especially in compartments 1 - 4 above, has resulted in the past in the use of selective weedkillers for their control. These plants have developed especially on areas formerly disturbed, and it is considered important that further disturbance does not tend to encourage their development further. In order to encourage the re-development of a diverse flora in these areas, it is proposed that no further applications of weedkillers be carried out, and that any necessary control be gained by the mechanical cutting of the areas concerned in mid-summer.
- 3.3 River management will not generally be necessary so long as the grazing regime is adhered to. Excessive debris (wood and rubbish) may be cleared as necessary to maintain a free flow, but no other interference to the stream systems should be permitted.
- 3.4 The current extent of bushy cover is regarded as satisfactory for the conservation of breeding birds, as well as for the maintenance of open grazing. If development of scrub becomes a problem, removal should be carried out carefully in consultation with conservation bodies.
- 3.5 The existing public footpath is safeguarded, but unrestricted general access to the rest of the meadows will be discouraged. Access to the site for educational and study purposes will be allowed on a permit basis, to be obtained from the North Hertfordshire District Council. Other access is not considered desirable for the maintenance of the grazing regime.
- 3.6 It is intended that amenity tree planting will be carried out along the east and south-west boundaries. The species used will be native, and will be sympathetic to the site. Details of planting schemes will be agreed with the Nature Conservancy Council before implementation.

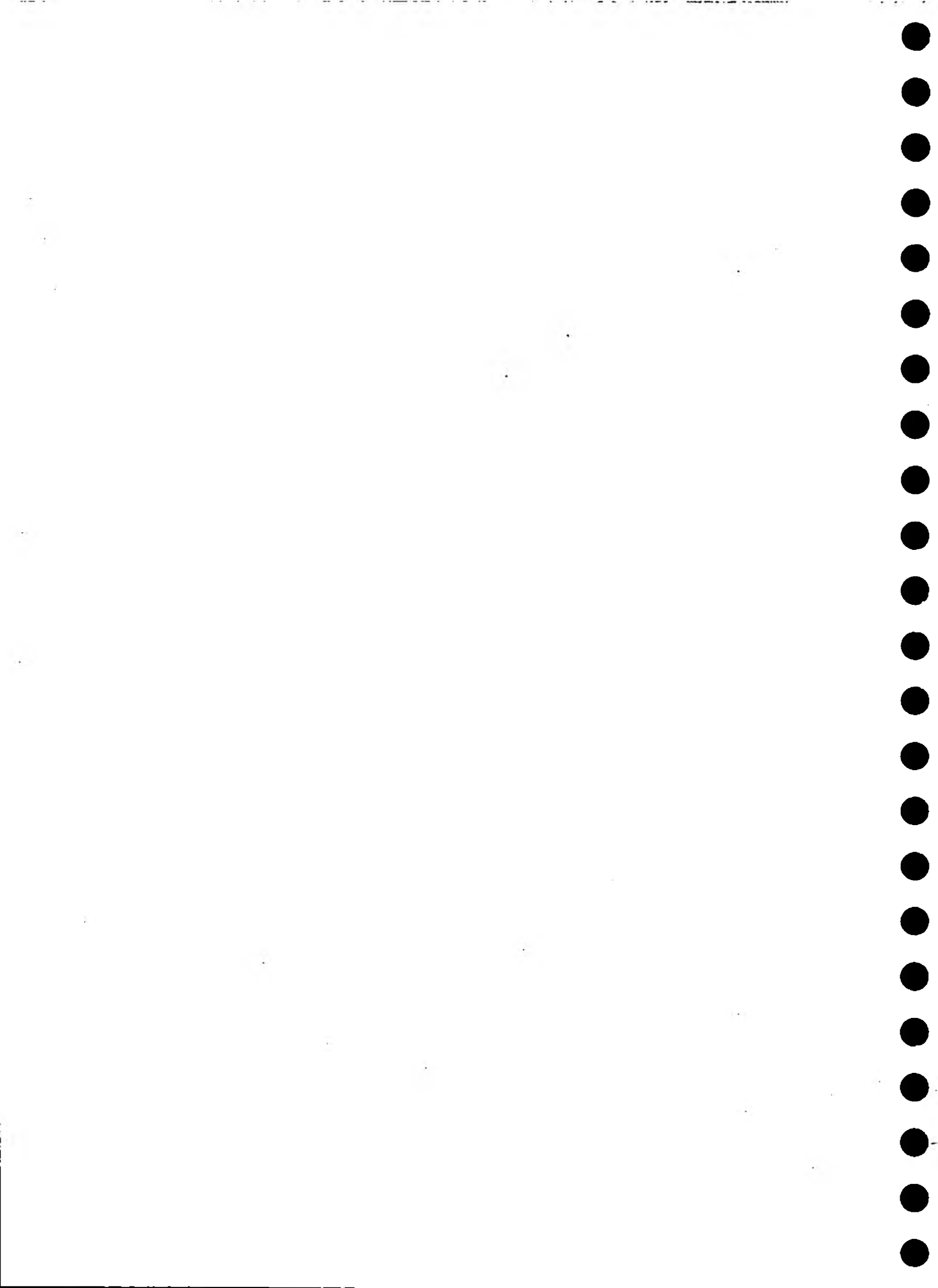
North Hertfordshire District Council
Museums Services, Natural History Department.

19 Sept. 1983.



PURWELL MEADOWS





Habitat characteristics

Calcareous loam pasture on alluvium, with associated flush-line springs and riparian marsh, some well-established thorn scrub, chalk river and mill-stream and associated springs on site of former watercress beds.

Management history

Apart from one area, the entire site has almost certainly never been ploughed. It has apparently been a low-grade cattle grazing for a very long time, and was formerly subject to Lammas grazing rights by the people of Walsworth. A mill has been on the site nearby since at least the 16th Century, and the watercourses have not appreciably altered since that time, although the main river flow is now along the course of the millstream rather than the original river. Recent grazing has been by up to 20 Friesian cattle. A strip of the meadow near the Walsworth Road was affected during the laying of a pipeline in 1972.

Conservation value

The range of grassland and marshland habitats is exceptionally wide for such a small site. At one extreme, the pasture approaches true chalk grassland, with characteristic species such as Polygala vulgaris, Scabiosa columbaria and Ophrys apifera; while at the other extreme the calcareous pasture grades into base-rich marshland with some locally rare species such as Carex distans, Carex rostrata, Epilobium palustre and Polygonum bistorta, as well as a fine colony of the Southern Marsh Orchid (Dactylorhiza praetermissa). The drier, neutral areas of the pasture also support a fine population of Saxifraga granulata and some Ononis spinosa. As such, the meadow is the last example of the alluvial grazing meadows which at one time were a feature of the Hitchin area, most of which have now either become derelict or have been improved.

The higher plant flora is well-recorded, and is known to be exceptionally rich, with upwards of 264 species of plants recorded since 1967. Considerable attention has also been paid to the fungus flora of the site, and 76 species are recorded since 1968. These include at least 19 species regarded as uncommon in Hertfordshire, especially various species of Mycena and Hygrocybe. Several have been new County records. Bryophytes have also been examined in some detail, although currently available data is incomplete.

The meadows are of some considerable local importance for birds, especially for passage and feeding. As part of the Hitchin Gap complex of habitats, they are on a minor migration route, and the marshlands and riverside are of importance locally for aquatic birds, including Kingfisher, Heron, Green Sandpiper, Snipe and Jack Snipe. There is a sizeable breeding population of Reed Buntings and the grassland is a regular feeding ground for finch and thrush flocks.

No study has been carried out on invertebrate life or aquatic life.

4. Area with Ellipandula ulmaria, Sorchoragala cespitosa, Centaurea nigra, Lysimachia nummularia, Galium oliginosum.
5. Marsh contained Glyceria fluitans, Stellaria alsine.
6. Beside river, marsh had Carex hirta, Carex? spicata, Cynosurus cristatus, Bellis perennis, Trifolium repens and T. pratense.

Description

Marshes were slightly variable in composition, the richer areas corresponded with presence of J ? subnodulosus, and species such as Caltha palustris, Dactylorhiza fuchsii, D. praetermissa, Valeriana dioica are locally uncommon.

B.1.1. Neutral Unimproved Grassland

Found on NW bank of river where land rises gently.

Dominant species: Alopecurus pratensis, Dactylis glomerata, Holcus lanatus, Poa trivialis, Ranunculus acris, Trifolium pratense, T. repens.

Frequent species: Bellis perennis, Cynosurus cristatus, Centaurea nigra, Rumex acetosa, Potentilla anserina, Veronica chamaedrys.

Description

This part of the site is perhaps the area most used by the public for recreation, particularly dog exercising. There are a few scattered bushes of hawthorn. The central part of this grassland has a number of base-rich species such as Briza media, Sanguisorba minor, Pimpinella saxifraga and Ononis spinosa, but these are confined to a relatively small area. (Polygala vulgaris, Ophrys apifera and Scabiosa columbaria are recorded from this area). The majority of the grassland is fairly rough with coarse grasses and Cirsium arvense is common towards the south end.

B.2.2. Neutral Semi-Improved Grassland

Dominant species: Poa trivialis, Dactylis glomerata, Alopecurus pratensis.

Description:

Slightly raised area in northern corner of the site which was once an enclosed field. Bounded by a bank to the remainder of the field. It is tall grassland with only a few herbs eg Anthriscus sylvestris, Achillea millefolium, Heracleum sphondylium, Ranunculus acris, R. bulbosus, Rumex acetosa, R. obtusifolius, Taraxacum officinale, Trifolium sp., Veronica chamaedrys. Other grasses were Lolium perenne, Poa annua. The grassland appears to be of little merit and contained frequent thistles and nettles and is crossed by a public footpath.

B.4. Reseeded Grassland

Dominant species: Holcus lanatus, Lolium perenne, Trifolium pratense, T. repens.

A strip of resown grassland marking the pipeline.

G.1. Pond

The two ponds marked are probably seasonal but one area was quite extensive with clumps of Carex paniculata. Marginal species included Veronica beccabunga, Glyceria fluitans, Stellaria alsine, Lysimachia nummularia, Carex flacca, Apium nodosum, Nasturtium officinale, Equisetum fluviatile, Ranunculus ficaria, Eleocharis palustre, Oenanthe sp., Lycopus eufopeus.

The smaller pond at the east end was less diverse but supported Alisma plantago-aquatica.

Watercress Bed

Developed on calcareous springs and covered with Nasturtium officinale.

G.2. River

Flow in R. Purwell was very sluggish above confluence with the mill stream which was by comparison a fast-flowing stream. The mill stream contained Ranunculus ? penicillatus and Callitriche ? obtusangular as well as Nasturtium and V. beccabunga. The river also contained the latter 2 species and there was a small clump of Typha latifolia.

J.2. Hedgerow.

A thick mature hedgerow (untrimmed). Borders site to Purwell Lane and has a cattle-proof barbed wire fence inside. Composed of a mixture of species, Crataegus monogyna, Sambucus nigra, and Ulmus sp. The southern boundary hedge contained mature Fraxinus excelsior. Bordering the watercress beds was a hedge of pollard dead Salix sp. Dead Elms are found in the hedge bordering the playing field.

Summary

Parts of the site known to be Lammas Land but some areas were previously under cultivation (see 1818 survey) and the quality of the site is therefore not uniform. The site lies on alluvium overlying Lower Chalk and the base-rich soil is reflected in some of the species found.

A very rich site with a variety of habitats including marsh, neutral grassland, (both showing base-rich influence), scrub, a river system and calcareous springs. It contains a number of species rare in Hertfordshire.

Carex distans, C. rostrata, Epilobium palustre, Polygonum bistorta, Saxifraga granulata, Triglochin palustre, Valeriana dioica, Dactylorhiza praetermissa and of local rarity (see N. Herts Museums records).

:. ROUGH GRASSLAND TO SOUTH OF WATER CRESS BEDS

This area was recorded as Lammas Land ie grassland in survey of 1818. It is now a neglected area with a variable composition.

B.1.3. Acidic Marshy Grassland

Area 1 Dominant species: Juncus inflexus, Carex acutiformis, Equisetum palustre, Epilobium hirsutum (locally dominant), Filipendula ulmaria (l.s.). Fairly wet and contains small pools of water with Glyceria sp., Veronica beccabunga, Lycopus eufopeus. Contains a wide variety of herbs and grasses into rough grassland with tall herbs.

Area 2. Dominant species: J. inflexus, C. acutiformis, E. palustre with J ? subnodulosus.

This area was less diverse and had fewer herbs.

B.2.1. Neutral Unimproved Grassland/C. Tall Herbs

Tall, neglected and rank vegetation surrounding marshes above and particularly rough near the entrance.

Dominant species: Poa trivialis, Dactylis glomerata, Arrhenatherum elatius. 'Rough' herbs frequent were Anthriscus sylvestris, Cirsium arvense, Galium aparine, Epilobium hirsutum. Urtica dioica was locally dominant.

A small area in the centre of the site was dry and appeared to be grazed by rabbits. Composition suggested a calcareous influence.

Festuca ? rubra, Lathyrus pratense, Lotus corniculatus, Galium verum, Centaurea nigra. It contained one clump of Ononis spinosa associated with Carex flacca.

J.2. Hedge

On the southside were mature trees in the hedgerow eg Tilia sp., Aesculus hippocastanum, Fraxinus excelsior with Crataegus monogyna, Sambucus nigra, Corylus avellana and by the springs Ulmus in the hedgerow.

Summary

Although this area is very rough and neglected, and would be difficult to graze without removing fences it forms a useful extension to the main area of meadow, but the marsh and grassland are ^{not} of comparable composition to Purwell Meadow.

D. GRAZED PASTURES NEAR PURWELL MILL

Field 1. NE of Mill Stream

This field was recorded as grass in the 1818 survey. It is at present horse-grazed with considerable scrub and has a patchy composition.

A.2.2. Scattered Scrub

Crataegus monogyna - some very fine trees 6m high and Sambucus nigra. Mostly the scrub is found along the stream bank with Stachys sylvatica, Clematis vitalba, Bryonia dioica.

A.3. Scattered Tree

One Quercus robur.

B.2.2. Neutral Semi-Improved Grassland

Rather rough, patchy grassland. Horse grazing has resulted in overgrazing near the entrance and rough, tall areas near the scrub. Five horses at time of visit. Horse shelter near entrance. Composition of grazed area: Poa annua, Plantago major, Trifolium sp., Ranunculus repens, Poa trivialis.

Rougher patches ungrazed were composed of Urtica dioica, Anthriscus sylvestris, Poa trivialis. By the roadside hedge in addition were Lamium album, Stellaria media, Galium aparine, Cirsium arvense, Alliaria petiolata.

Other plants in the grassland were:

| | |
|-------------------------|----------------------------|
| Achillea millefolium | Matricaria matricarioides |
| Alopecurus pratensis | Medicago lupulina |
| Bellis perennis - f | Plantago lanceolata |
| Bromus sterilis | Poa pratensis |
| Capsella bursa-pastoris | Ranunculus acris |
| Carex hirta | Rumex sp |
| Cerastium fontanum | Senecio jacobea f. |
| Cirsium arvense - f | Taraxacum officinalis |
| C. vulgare | Trifolium pratense |
| Conium maculatum | Tripleurospermum maritimum |
| Convolvulus arvensis | Veronica chamaedrys |
| Dactylis glomerata | V. persica |
| Geranium robertum | V. serpyllifolia |
| Glechoma hederacea | |
| Lolium perenne | |

The horses have made bare tracks and the entrance gate is disturbed with many weed species.

The river bank is fairly steep with species such as Veronica beccabunga, Nasturtium officinale, Barbarea vulgaris, Epilobium sp., Scrophularia nodosa. The river edge was puddled at the northern end. There was no floating vegetation.

Field 2. Between Mill Stream and River Purwell

This field was recorded as Arable in the 1818 survey.

A.3. Scattered Trees

Fraxinus excelsior, Malus sylvestris, Quercus robur, Acer campestre.
Mostly on edge of field by water courses.

A.2.2. Scattered Scrub

Crataegus, Sambucus nigra mostly on edge but a group of Sambucus nigra in centre of field.

Some Prunus spinosa, trimmed by horses, with high Urtica and Galium aparine at end near Mill and Bryonia dioica occasional.

B.2.2. Neutral Semi-Improved Grassland

Some tall grass/tall herbs left by horses especially near scrub.
Composition similar to Field 1 - fairly rough but apparently fewer weeds evident. One area was under water (visit followed very wet weather).

| | | |
|----------------------------|---------------------|-----------------------|
| Alopecurus pratensis | Plantago lanceolata | Achillea millefolium |
| Alliaria petiolata | Cirsium arvense | Anthriscus sylvestris |
| Urtica dioica | Poa pratense | Glechoma hederacea |
| Ranunculus bulbosus | Galium aparine | Rubus sp. |
| Senecio jacobea | Poa trivialis | Rosa sp. |
| Veronica serpyllifolia | Galium aparine | Veronica beccabunga |
| Trifolium sp | Urtica dioica | Ranunculus repens |
| Plantago major | Bellis perennis | Hedera helix |
| Cerastium fontanum | Veronica persica | Lathyrus pratensis |
| Tripleurospermum maritimum | Veronica chamaedrys | Geranium robertum |
| Dactylis glomerata | Silene alba | Aegopodium podagraria |
| Vicia sepium | Mentha aquatica | |
| Holcus lanatus | Ranunculus acris | |

Bank by stream at Northern end - Carex hirta, Festuca rubra. No grazing at time of visit.

R. Purwell collects a great deal of rubbish, ironmongery, wood, tyres, plastics, concrete and garden rubbish from housing estate.

In more remote part though nearer Purwell Mill there are parts where water plants flourished: Mentha sp., Veronica beccabunga, Nasturtium officinale, Scrophularia nodosa, Juncus effusus, Myosotis sp., Lycopus europeus, Alisma - plantago-aquatica. Flow is fairly sluggish, vegetation - Callitriche sp.

Field 3. South of River Purwell

A.2.1. Dense Scrub

Narrow development of scrub along SW boundary where elms have been felled - elm suckers and Sambucus nigra with Urtica beneath. This area is prone to the dumping of garden rubbish from the adjacent housing estate.

A.2.2. Scattered Scrub

Crataegus monogyna, Sambucus nigra quite sparse, and small shoots of Ulmus 1m, in grazed area, nibbled by horses. Atropa belladonna found near Sambucus nigra.

A.3. Scattered Trees

Fraxinus excelsior, Acer campestre by stream and hedge.

B.2.2. Neutral Semi-Improved Grassland

Appeared heavily-grazed, near entrance fairly high percentage of bare ground. Horse jumps.

Composition Poa sp., Trifolium sp., Rumex sp., Cirsium arvense.

Ungrazed area Urtica dioica, Galium aparine, Anthriscus sylvestris, Bromus sterilis, Alopecurus pratensis, Dactylis glomerata, Poa trivialis, Ranunculus acris.

Additional plants in margin of scrub.

Achillea millefolium
Arctium sp.
Arum maculatum
Glechoma hederacea
Lamium album
Mercurialis perennis

Poa annua
Ranunculus repens
Silene alba
Stellaria media
Veronica chamaedrys
Vicia sepium

By river, Epilobium hirsutum, Geranium robertum.

Summary of Grazed Pastures.

These three fields have been degraded by excessive horse grazing.

They have a relatively poor species composition and are not considered to be of SSSI status.

PURWELL MEADOWS,
PSSI

Hitchin
Hertfordshire.

Grid. Ref TL 199 299

drawn by J. Welsh

sources of information

1) field survey 4.6.1983

2) visits 7.5.1983

3) N Herts Museums data.

or Survey of Hitchin by W Herrett 1818

Tetrads 12 Z
13 V
22 E
23 A

N ←

Malus sylvestris

Houses.

Arable - 1818 Survey.

Houses

brick round
drain outlet

Ranunculus penicillatus
Callitriche obtusangular

Cirsium spinosa

Arable
1818

Raised and levelled
Area.

PURWELL

MEADOW

Houses

A505

Grass 1818

3.

3.

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3.

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Carex paniculata
Ceanothus sp.

Typha latifolia

Grass 1818 'Lammas'

Cirsium spinosa in dry, Calcareous grassland

Grass 1818 'Lammas'

ROUGH PASTURE
Mature hedgerow

Epilobium hirsutum

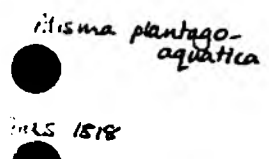
N. Herts College.

Scale, 1:2500 approx

creeping plants

creeping

Scale, 1:2500 approx



Marshy grassland

PURWELL NINESPRINGS LOCAL NATURE RESERVE

The reserve was leased to the Hertfordshire and Middlesex Trust for Nature Conservation in 1980. It consists of about 18 acres of wetland including an alder carr, two meadows, small areas of open water, hedgerow, scrub and a derelict area.

1. This is the largest area of open water (although in dry weather it does dry out completely). There are patches of Reeds, Sedges and Bulrushes and other plants include Purple Loosestrife Water Plantain and Amphisbious Bistort. It is an important area on the reserve for Frogs, Toads, Water Voles, Moorhens, Sedge and Reed Warblers, and Reed Buntings. Not only is it interesting for wildlife it has educational potential.

2. The bushes and trees provide feeding and nesting sites for many small birds, including several species of warbler.

3. The Gypsy Lane footpath is the eastern boundary of the reserve. There are many tree species in the hedgerow including Maple, Hazel Oak, Elm, Hawthorn, Blackthorn and Elder. Birds to be seen include Yellowhammer, Linnet and four types of finch.

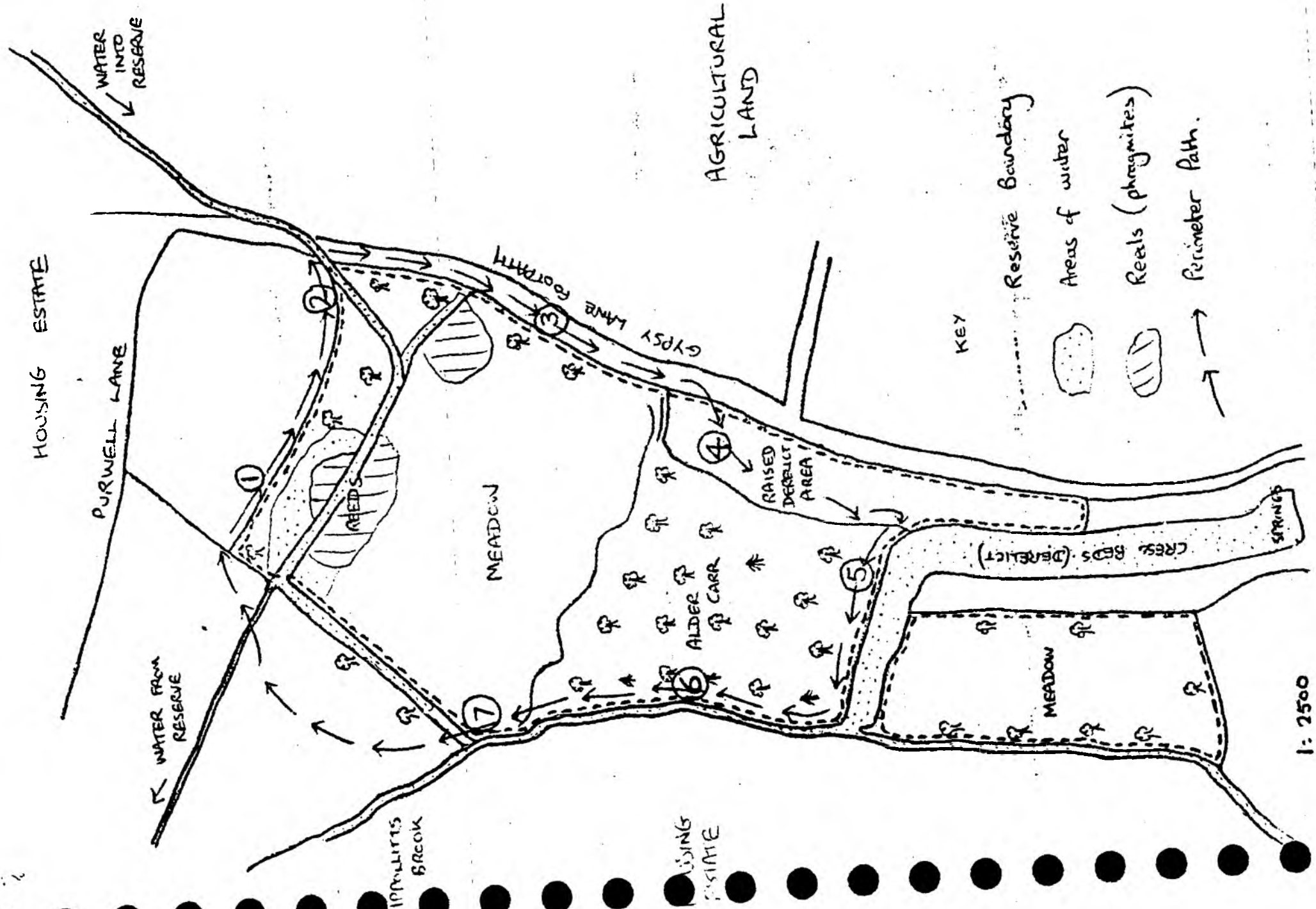
4. The raised derelict area has little immediate conservation value. Lack of soil and frequent use by motor-cyclists reduces the chance of plant colonisation.

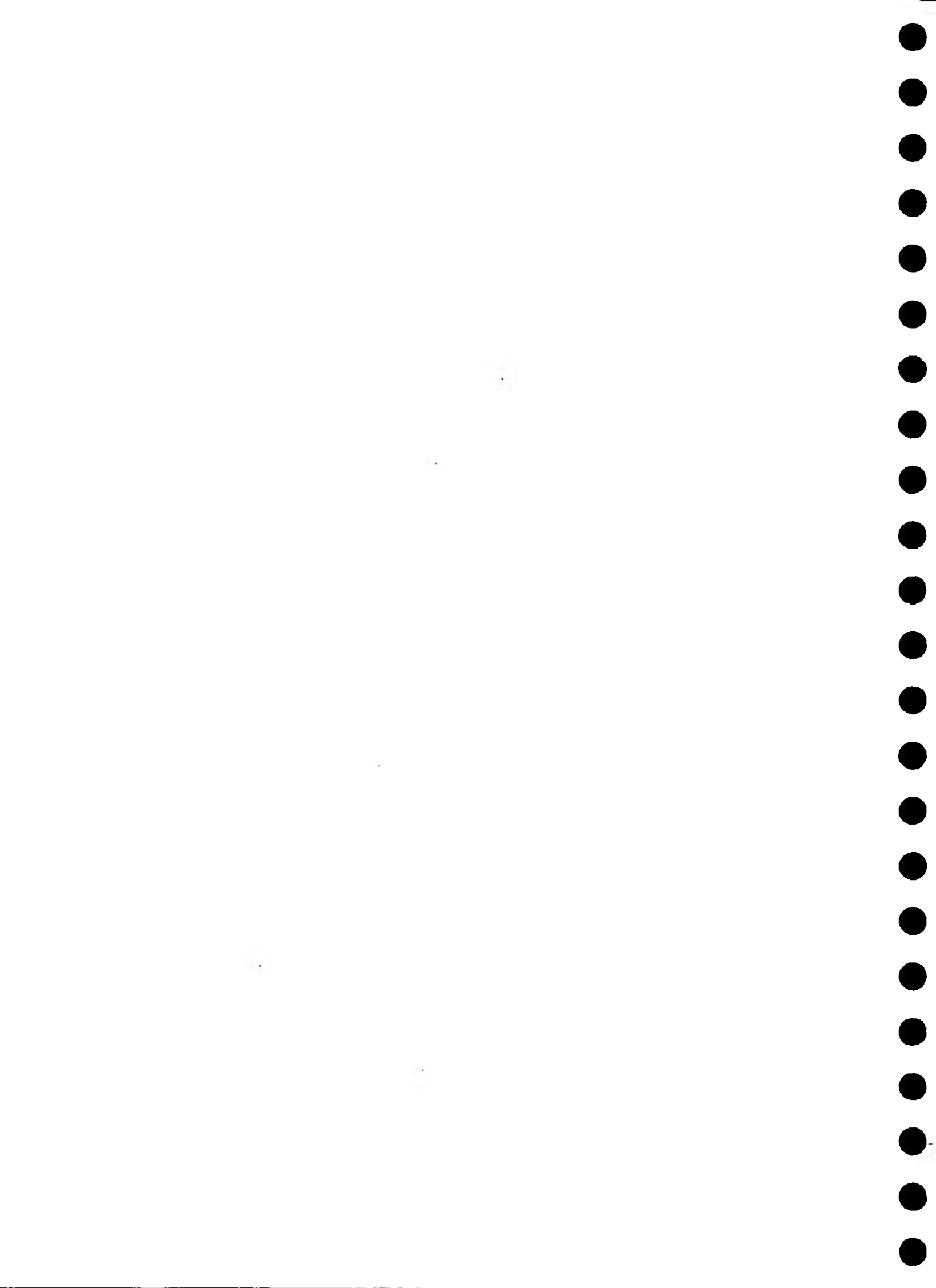
5. The path alongside the disused cress-beds is well used but is not a public right of way. The springs are at the far end and provide a constant supply of clean water feeding into the Ippollitts brook. On the other side of the line of willows is a meadow. It is part of the reserve, detached from the rest. The vegetation is thick. Willow-herb and Meadow Sweet abound.

6. The path follows the brook. Formerly the path meandered into the wood increasing the disturbance on the wildlife. The wood is an alder carr; alder being the dominant tree species but there are mature trees of Oak, Ash, Hornbeam, Larch, Scots Pine and Holly as well. Spotted Flycatchers nest but several other typical woodland birds only visit the wood outside the breeding season. Stickleback, Water Shrimp and Caddis-fly larvae are among the animals that can be found in the brook.

7. Sedges, Rushes, Reeds and Grasses along with Meadow Sweet and Willow-herb are the dominant plants in the wet meadow. Hopefully conservation measures will result in the natural occurrence of other interesting plants to add to the Marsh Marigold, Cuckoo Flower and Ragged Robin that bloomed in 1980.

It is possible to appreciate the features of the reserve by following the perimeter path and management will seek to improve these features of what is already an interesting wetland habitat.





Purwell NinespringsGeneral notes

Following complaints about the general state of the remaining open land beside the Chilterns Estate passed to the Museums Department, these notes have been compiled on the natural history interest and threats to habitats in this interesting area of land.

All the compartments of land to the east of the River Purwell from its source at Ninesprings to the Purwell Mill were examined. Notes should be referred to the attached map.

Existing state of landCompartment 1

Derelict marshy meadow in the south, with half the upper area recently covered with dumped earth etc. and levelled. The remaining marshy area is mainly overgrown with sedge and flote-grass. Condition of trees bounding the site generally poor. Habitat reasonably important for mammals, insects.

Compartment 2

Until recently, northern half of the meadow a good low-grade pasture. Southern part of the area fades generally into an area of marshy former woodland, with old scrub and reeds, etc. Trees in the southern section very poor, except for some ancient willows. Overall habitat very varied, botanically quite rich, and good habitat for mammals, birds, insects. Some old trees carry a lichen growth almost unparalleled in the area.

Compartment 3

Former meadow, now developed into a dense sedge bed, with alders encroaching from the south, and a large area of well-established reed bed in the north. The reed bed is probably unique in the Hitchin area, and the sedge bed is interesting botanically, as well as being excellent cover for small mammals.

Compartment 4

An important alder/ash woodland on swampy ground. The flora is quite rich, and birds, mammals, insects are well-represented. It is bounded on the south and west by fresh water habitats, and by a dry ditch on the north. The east boundary is formed by an artificial bank rising to an open derelict area.

Compartment 5

Derelict marshy meadow, with fair flora. Good habitat for mammals, birds, etc. Reasonably free from interference.

Compartment 6

Compartment 6

Artificially raised area (about 10 feet from original level), with dumped earth, road tarmac, bricks, etc. Botanically unusual but derelict in appearance.

Compartment 7

Derelict grassland on raised land. Habitat poor, except perhaps for small mammals

Other areas

Ninesprings Watercress Beds.

Well fenced and still active. Well looked after, and important for wildfowl, freshwater life. Springs flowing strongly.

River Purwell/Ippollitts Brook

Suffering badly from dumped builders rubbish from the Chilterns Estate, and from children's disturbance from the estate. Riverside path with tarmac does not help the problem. Might be a problem with pollution - public health danger? River is important for freshwater life, and as a boundary against the Alder/ash swamp and other habitats. This does not, however stop considerable access by children. Danger of disturbance of nests in breeding season. Some damage to trees, etc already.

Public Bridleway.

This leads from the end of Kingsland Road to the Wymondley Road at Ninesprings. Much dumped rubbish at the entrances, and gipsy camp half-way along. Tipped builders rubbish also a problem along what could be an attractive walk. Trees along the bridleway suffering from neglect.

Possible improvements

Limitation of dumping of earth to the present site is important. Other habitats could be better conserved as an open area. Compartments 1, 3 and 5 could be much improved by infrequent mowing, and then by periodic grazing. The reed bed in Comp. 3 should be protected. The area of derelict trees in Comp. 2 could be encouraged with planting.

The alder/ash woodland should be protected, especially with some form of fencing against access from the estate. Trampling could seriously damage this habitat.

Suggest that ways be found to improve the derelict meadows in Comps. 7 and 6. Public bridleway needs urgent clearing and tidying up, along with some barriers against further dumping.

Rivers bordering the estate should be carefully looked at, and all builders rubble etc should be cleared by the contractors.

This whole area could be brought together to make a small country park/nature reserve on the town's boundary.

Extracts Purwell Ninesprings

1980 Annual Rpt

This site, which adjoins the south east corner of Hitchin, will be known as the Purwell Ninesprings Nature Reserve. Details will appear in our September issue."

In actual fact the land comprising the Purwell Ninesprings Nature Reserve, forming part of Purwell Farm, Hitchin and excluding the watercress beds, was leased to the Trust on 8th May, 1980. An annual payment of one pound is due for the fifty year period of the Lease. The owner, Mr. R.P. Flint of Hove, Sussex, through his 'attorney' Mr. M.F.P. Flint (the son of Mr. R.P. Flint) retains the right in law to cancel the Lease on six months' notice (the Trust also has this right), and also to resume possession "for the purpose of building or similar development" on three months' notice. The Trust is also required on expiry or termination of the Lease to effectively leave the reserve as it found it.

The plan of the reserve as attached to the Lease is shown in Figure 1. In particular note that the reserve is in two unconnected parts separated by the L-shaped watercress beds. Initially it was hoped to include the watercress beds in the reserve, as noted in the Trust Newsletter but these were bought by a local farmer before the Trust was able to come to a decision. In some respects, therefore, the reserve is a compromise - the well-known Purwell Meadows further downstream are generally reckoned to have a more interesting flora but it does have many interesting features in its own right. In these days of diminishing wetland sites the reserve at Purwell Ninesprings is, nevertheless, a significant addition to the growing list of reserves managed by the Herts. and Middlesex Trust for Nature Conservation.

2. A DESCRIPTION OF THE RESERVE

The Purwell Ninesprings Nature Reserve is situated on the eastern edge of Hitchin, and amounts to some 18.8 acres. The larger part consists of a pond and reed beds, hedgerows, scrub, sedge bed and wet meadow, alder carr, an alder and ash wood, and a raised derelict area. The smaller part is a wet meadow. The two parts are separated by former watercress beds whose water comes from the "ninesprings" which give the reserve its name. The watercress beds are now run as a

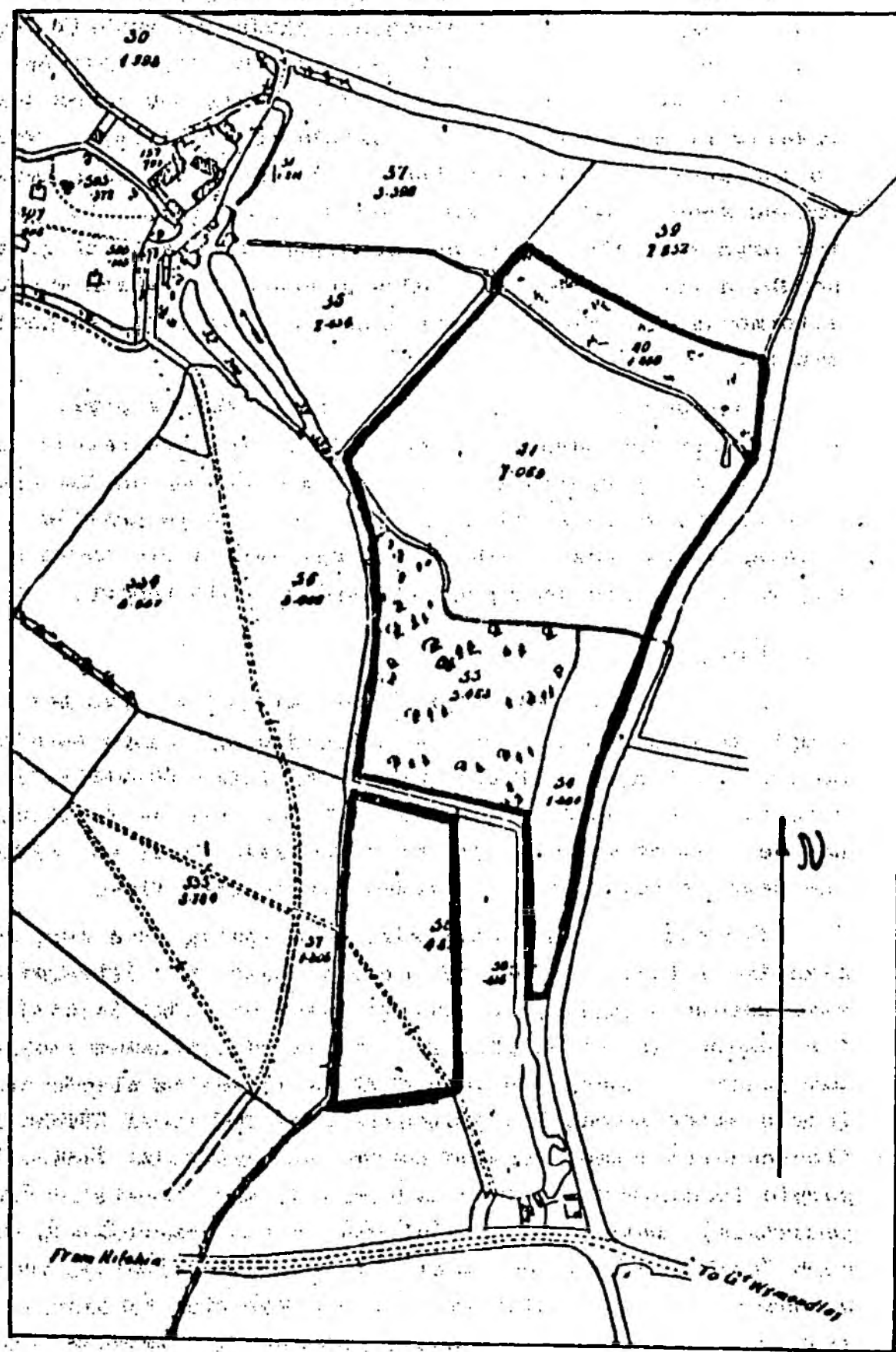


Figure 1. The plan of the reserve as attached to the Lease.

7

small-holding with ducks, geese, chickens, guinea fowl, a goat, donkey and all the necessary sheds and outbuildings. The water from the springs flows into the Ippollyts Brook where it becomes the Purwell River. This separates the reserve from a recent housing estate (since 1976). The land to the east is arable farmland. To the south is a small raised meadow and the road to Great Wymondley. To the north the area is again raised and consists of an area of grass and scrub, a recreation field and a grassed area which may become allotments. Beyond Purwell Lane is an established housing estate.

In order to refer easily to the different parts of the reserve for the purpose of recording, etc. the reserve is divided into compartments, these being chosen on the basis of habitat, while still being large enough to provide meaningful records. The five compartments are shown in Figure 2, and are used henceforward in this report.

2.1 Flora

Extensive records of the flora on the reserve have been compiled over a number of years, including groups such as mosses and fungi, by Frank Bentley (a local naturalist) and others. The overall appearance of the reserve is thought not to have changed for probably 20 years or more; certainly the meadows have not been grazed during that time.

The flora is characteristic of a spring-line fen, with alkaline water. There are three areas of reed (*phragmites*), some reedmace (*typha*), extensive areas of sedge (*carex*) in the meadow, *glyceria*, *phalaris*, areas of *polygonum amphibium* and *juncus*. Among the more obvious flowering plants are lady's smock (*cardamine pratensis*), ragged robin (*lychnis flos-cuculi*) common spotted orchid (*dactylorhiza fuchsii*), purple loosestrife (*lythrum salicaria*), marsh marigold (*caltha palustris*), water plantain (*alisma plantago-aquatica*), willow-herb (*epilobium*), meadowsweet (*filipendula ulmaria*), marsh woundwort (*stachys palustris*), marsh valerian (*valeriana dioica*), small teasel (*dipsacus pilosus*) and tussock sedge (*carex paniculata*). There is also a good variety of woody plants such as alder, ash, oak, elm, scots pine, larch, white willow, black poplar (species of), holly, hornbeam, hawthorn,

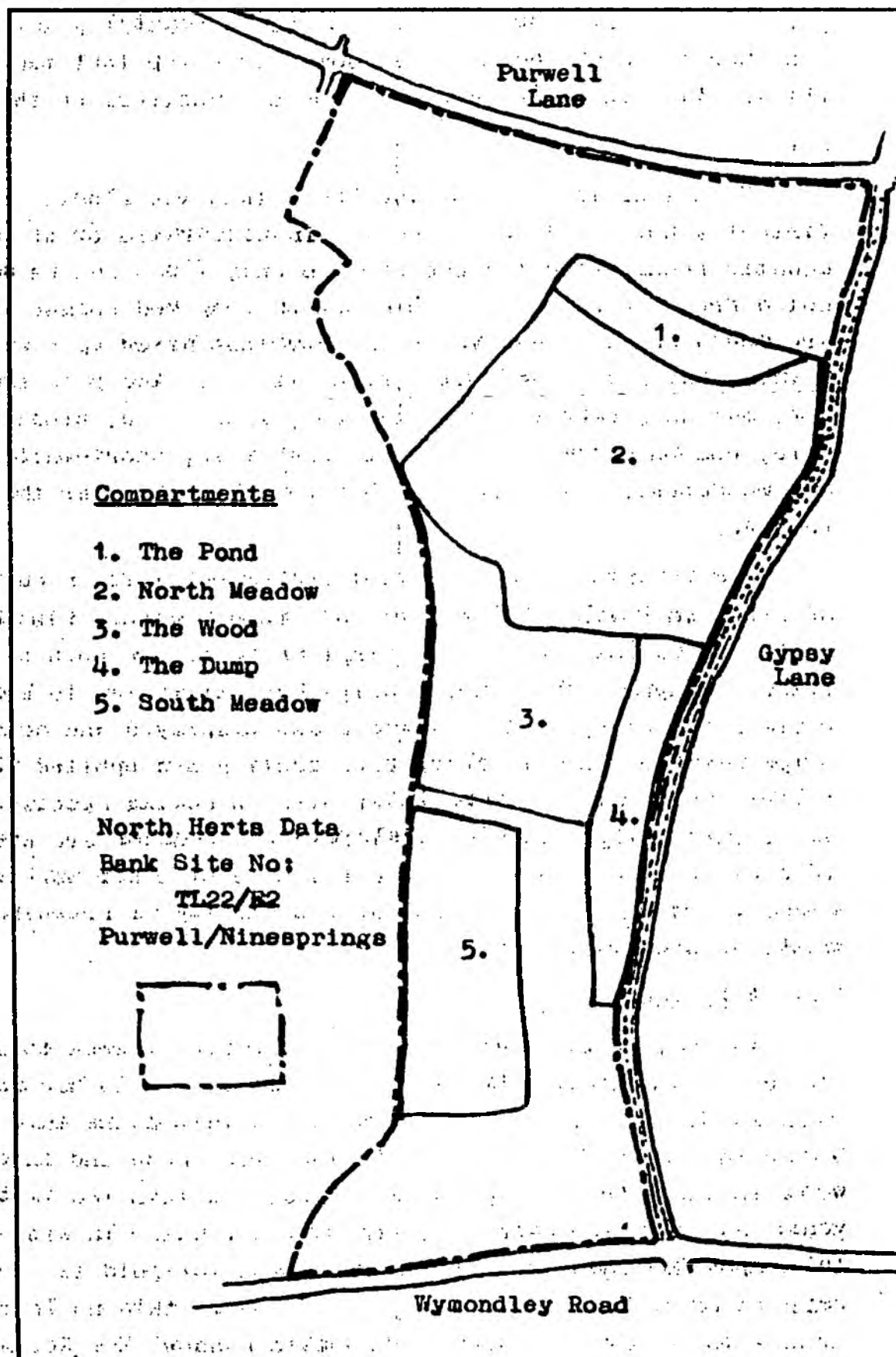


Figure 2. The division of the reserve into compartments for recording purposes and their correspondence with the North Herts Data Bank reference system.

blackthorn, elder, dogwood, guelder rose, silver birch, and also some areas of bramble (rubus) and many others such as garden escapees. Southern marsh orchid (dactyl.praetermissa) has been found on the North Meadow within the last ten years (it is still found in Purwell Meadows downstream of the reserve).

2.2 Fauna

Much less is known of the fauna than the flora. Virtually nothing is known of the invertebrates or of the aquatic fauna; sticklebacks are the only fish species so far noted from the records. Both common frog and common toad are found and the reserve is an important breeding area for both. Mammals present at various times of the year are the fox, muntjac, rabbit, grey squirrel, water vole, brown rat, mole, common shrew, pigmy shrew, bank vole, short-tailed vole and woodmouse. At least two bat species feed over the reserve.

The reserve is an important winter roost for a number of birds including yellow, corn and reed bunting, blackbird, robin and various finches. Kingfishers can be seen at most times throughout the year. Snipe have attempted to breed, while a lesser spotted woodpecker has displayed and drummed. Sedge warbler, reed warbler, reed bunting and spotted fly-catcher are among the more interesting breeding species. Water rail, snipe, siskin, fieldfare and redwing are present in winter. It is also an area favoured by other warblers. cuckoo, and turtle dove, though, the variety of breeding woodland species is low.

2.3 Hydrology

The key to the habitats of the reserve is seen to be the water, or more precisely, the water table. This has fallen, even in the last five or six years, and this means that the water in the brook and river, in the cress beds and in the wood is lower than at any time before. Within the last ten years parts of the wood were always under water in winter, and this provided ideal conditions for marsh marigold to form carpets of yellow in April and May. Sadly this no longer occurs to any great extent. The main meadow, the North Meadow, the ditches and the pond area have become wetter because there is a constant flow of water into the N.E. corner and

due to increasing amounts of silt deposition the water flows more slowly through the reserve giving it more chance to drain into the meadow. The pond area is a derelict wood, the water level having risen to produce the change. The water, though moving slowly, is not retained and the pond dries out completely in dry conditions. At these times there is virtually no open (standing or flowing) water on the reserve.

2.4 Reserve Management

At this time it is only possible to give a brief discussion of possible management aims and policy. For some time after the acquisition of a new reserve it is necessary to find out as much as possible about the history (both past and present) of the reserve and its flora and fauna. At the very least a full year of observation and surveying has to be undertaken to appreciate the changing character of the reserve with the changing seasons. Only then can an attempt be made to think of managing the reserve properly. What follows here must, therefore, be taken only as a first draft.

In general it is thought that management of the reserve should aim to maintain and improve the quality and possibly the variety of wetland habitat while taking into account the needs of particular species. The character of the alder wood should be retained. The quality and extent of open water should be increased and efforts be made to retain the water so that regular drying out does not occur. The nature of the sedge and reed beds should be retained providing as they do such an important bird roost. However, the flora of the meadow is being swamped by the sedge so a compromise needs to be made between reducing the sedge to allow other marshland plants to thrive and retaining the nature of the sedge bed. The significance of the reed beds would be greatly increased if the two areas of the reeds in the meadow were joined. The area would show succession from wood, carr, sedge bed, short vegetation/mud/shallow water, sedge, reeds, ditch, pond area. This would retain significant areas of sedge, increase the extent of reed, increase the amount of water and water margins with mud patches, and include a significant area of short vegetation.

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The nearness of a large population, however, means that there are many problems due to intrusion, fires, rubbish dumping, cutting of trees, shooting, general vandalism, trampling, 'camps', motorbikes. All these will be reduced if the wetness of the reserve is increased making access less attractive and if it is more difficult to enter the reserve. The success of any habitat/species management will be dependent upon reducing unwanted intrusion. Therefore, it may be necessary to compromise the habitat management if it means that gains are made, for example, by creating more effective barriers.

3. CHAIRMAN'S REPORT

This report of the first year of the reserve is necessarily written as a personal view of the events which took place. The first year of the reserve was also the first year of the Hitchin Group. In the early days the two were virtually synonymous, and so it is appropriate to record both here.

The very nature of voluntary work, such as nature conservation, means that it is often difficult to call upon a large work-force to set up new ventures. With nature reserves, for instance, it is usual Trust policy at the time of negotiating for a new reserve to look for the nucleus of the future Management Committee who will have the job of actually looking after the reserve. If there is already an active local group of Trust members near the new reserve then they may be called upon to help. Conversely if there is no local group (this has been the usual situation in the Trust) then the initiative may have to be taken by those individuals who are active in the area.

Elizabeth Maughan is well known in the North Herts. area as an active Trust member over many years, and for her drive and enthusiasm in conservation work. She has been particularly active in fund-raising, but is also on the Management Committee of the Watery Grove Nature Reserve at Stevenage, has been Secretary of the North Herts. Area Committee of the Trust for many years, and even finds time for other natural history societies. When in 1979 Elizabeth was faced with the prospect

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| 8 | Acet | cam | 207 | Astra | dan | 361 | Carex | derm | 538 | Colch | aut | 771 | Eupho | exi | 961 | Helic | pra |
| 5 | | pse | 208 | | gly | 363 | | dia | 540 | Gonio | mac | 772 | | hel | 962 | | pub |
| 6 | Acera | ant | 211 | Athyr | fil | 368 | | distans | 641 | Conno | naj | 777 | | peplus | 968 | Herac | spl |
| 7 | Achil | mil | 212 | Atrip | gla | 362 | | distans | 514 | Convo | arv | 2213 | Euphr | agg | 970 | Hiera | pil |
| 9 | | pta | 214 | | bas | 368 | | divisa | 548 | Corno | san | 783 | | ang | 979 | Hippo | com |
| 12 | Acino | arv | 217 | | lit | 369 | | divulsa | 550 | Coron | var | 798 | | nem | 980 | Hippo | rha |
| 15 | Acro | cal | 218 | pat | | 370 | | ech | 551 | Coron | did | 801 | | pep | 981 | Hippu | val |
| 19 | Adia | mos | 218 | sab | | 371 | | ela | 552 | | squ | 804 | | ros | 983 | Moicu | lan |
| 20 | Aegop | pod | 220 | Avena | lat | 373 | | eri | 553 | Coryd | cla | | | | 984 | | mol |
| 22 | Aescu | bip | 221 | | lud | 374 | | ext | 558 | | lut | | | | 988 | Honke | pep |
| 21 | Aethu | cyn | | | | 375 | | bas | 557 | Coryl | ave | 810 | Fagus | syl | 989 | Horde | cru |
| 22 | Aetbu | eup | | | | 381 | | bir | 569 | Crata | moon | 813 | Festu | aru | 991 | Horde | mar |
| 23 | | odo | 224 | Balde | ran | 382 | | bos | 570 | | oxy | 816 | | glg | 992 | | mur |
| 26 | Agrop | | 225 | Bailo | nig | 385 | | lae | 571 | Crepi | bile | 821 | | ovi | 993 | | sec |
| 28 | | can | 229 | Barba | per | 386 | | laa | 572 | | cap | 823 | | pra | 995 | Hotto | pal |
| 32 | | jun | 231 | Beill | per | 393 | | lep | 578 | | tar | 824 | | rub | 996 | Humul | lor |
| 38 | | pun | 232 | Berba | vul | 397 | | | 583 | Cuscu | epi | 830 | Filag | ger | 998 | Hydro | mur |
| 33 | | rep | 234 | Berul | ere | 397 | | nig | 589 | | epith | 831 | | nun | 999 | Hydro | vul |
| 35 | Agros | can | 235 | Beta | mar | 398 | | ova | 592 | Cymba | mur | 834 | Fili | mul | 1003 | Hyper | cal |
| 36 | | gig | 240 | Beitul | pub | 398 | | pal | 596 | Cynog | oil | 836 | Foeni | vul | 1004 | | cal |
| 39 | | sto | 241 | Diden | cer | 399 | | pal | 597 | Cynos | cri | 836 | Fraga | ana | 1008 | | clo |
| 40 | | ten | 242 | | tri | 401 | | panicca | 607 | Dacty | glo | 839 | | aln | 1010 | Lir-arutiu | |
| 41 | Aira | car | 243 | Black | per | 401 | | panicula | 817 | Daphn | lau | 843 | Frang | aln | 1011 | | burn |
| 42 | | pra | 244 | Dlech | spi | 404 | | pen | 620 | Daucu | car | 841 | Fraki | exc | 1014 | | per |
| 46 | Aluja | rep | 245 | Dlyam | com | 405 | | pil | 827 | Desch | oac | 847 | Fumar | cap | 1015 | | pul |
| 57 | Alche | ves | 248 | Lotry | lum | 407 | | pol | 628 | | de | 849 | | nuc | 1016 | | tet |
| 60 | | lan | 249 | Brach | pin | 407 | | pse | 630 | Descu | sop | 854 | | off | 1018 | Hypoc | gla |
| 62 | Alism | | 250 | | syl | 408 | | pul | 434 | Desuna | mar | 856 | | par | 1020 | | rad |
| 63 | | pta | 251 | Bras | nap | 412 | | rein | 435 | | rig | 858 | | val | | | |
| 64 | Allia | pet | 251 | Bras | nig | 413 | | ros | 440 | Gigt | pur | | | | 1022 | Iberi | ama |
| 73 | Alliu | urs | 252 | | ole | 414 | | ser | 644 | Diplo | nur | 862 | Baleo | lut | 1023 | Ilex | acu |
| 76 | | vin | 253 | | rap | 419 | | ros | 645 | | ten | 863 | Galeo | ang | 1030 | Insula | ooo |
| 77 | Alou | gla | 254 | Briza | nied | 421 | | syl | 646 | Dipsa | ful | | | | 1036 | Iris | foe |
| 79 | Aloue | aeq | 256 | Bromu | arv | 424 | | ves | | | | | | | | | |
| 82 | | ten | 258 | Bromu | arv | 424 | | ves | | | | | | | | | |

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| 84 | myo | 262 | com | 427 | Carli | vul | 647 | pil | 867 | ape | 1036 | pas |
| 85 | pra | 268 | lep | 428 | Carpl | bel | 637 | Drose | 868 | rot | 1047 | Isle |
| 87 | Altha | off | 269 | *mol | 432 | Casta | sat | 661 | Dryop | aus | 871 | Galin |
| 87 | Amnop | arv | 270 | mol | 433 | Catab | ayu | 664 | *bl | 872 | Galiu | ang |
| 88 | Anaca | pyr | 271 | rac | 440 | Centa | cya | 666 | spl | 873 | apa | 1048 |
| 99 | Anaga | arv | 273 | sec | 444 | | | | | 875 | eru | 1050 |
| 100 | ten | 273 | tbo | 440 | nig | | | | | 877 | ere | 1051 |
| 103 | Anemom | 276 | Dryon | dio | 451 | Centa | min | 670 | Ecliau | vul | 878 | ber |
| 106 | Amel | pul | 283 | Duton | umb | 453 | min | 673 | Eileoc | aci | 879 | *mol |
| 106 | Amel | pyr | 291 | Gakli | mar | 456 | Centu | idm | 674 | mul | 880 | mol |
| 113 | Anna | ste | 292 | Calain | can | 457 | Cepha | idm | 675 | pal | 882 | tri |
| 117 | Anthe | arv | 293 | spl | 461 | Ceras | arv | 677 | pos | 886 | tri | 1007 |
| 118 | cot | 296 | Calam | asc | 466 | glo | | 678 | uni | 887 | ali | 1009 |
| 121 | Antho | odo | 298 | nep | 469 | seni | | 679 | Eleg | flu | 889 | ver |
| 123 | Anthi | neg | 2249 | Calli | acc | 462 | tet | 681 | Eloke | can | 891 | Genis |
| 123 | syi | 303 | int | 467 | vul | 682 | Elym | are | 893 | ana | 1070 | sub |
| 128 | Anthy | vul | 304 | obt | 471 | Cerat | dem | 837 | Eindyn | nom | 897 | Geni |
| 128 | Anthi | oro | 307 | sla | 474 | Ulsen | min | 688 | Eiplo | ade | 900 | Geran |
| 131 | Aphas | *arv | 305 | ver | 476 | Chac | tem | 689 | adu | | 907 | dis |
| 132 | arv | 309 | Callu | vul | 477 | Chama | ang | 690 | lan | | 909 | luc |
| 133 | mic | 310 | Gethi | par | 480 | Cheli | ma | 694 | lan | | 911 | mol |
| 134 | Apium | gra | 2248 | Calys | *sep | 481 | Cheno | *alb | 693 | mun | 914 | pra |
| 135 | inu | 311 | nep | 484 | bon | 696 | obs | | 916 | pus | 1084 | Knaut |
| 137 | nod | 312 | sol | 487 | fic | 697 | pal | | 917 | pyr | 1087 | Koele |
| 142 | Arabi | tba | 313 | ayi | 483 | pol | | 698 | pas | 918 | rob | |
| 146 | Arabi | bir | 315 | Campa | elo | 502 | Chrys | leu | 700 | ros | 919 | rot |
| 150 | Arcti | agg | 321 | rap | 503 | par | 705 | Eipia | bel | 920 | sn | 1094 |
| 151 | lep | 320 | rapunculo | 504 | seg | 708 | pal | | 923 | Geum | 1098 | Lamtu |
| 152 | mun | 322 | rot | 506 | Chrys | opp | 710 | ses | 924 | riv | 1099 | amp |
| 153 | vul | 323 | tra | 509 | Ciclio | int | 712 | Equia | arv | 925 | urb | 1100 |
| 163 | Arena | lep | 325 | Capse | bur | 513 | Circu | lut | 713 | bu | 929 | Glauc |
| 161 | *ser | 327 | Carda | ama | 514 | Cirsi | aca | 721 | pal | 930 | Glauc | nar |
| 162 | ser | 328 | flo | 515 | arv | 721 | tel | | 931 | Gloch | 1104 | Lapsa |
| 166 | Armer | mar | 329 | bir | 516 | dis | 726 | Erica | cin | 932 | Glyce | 1108 |
| 167 | Armor | rus | 331 | pra | 517 | eri | 731 | tet | 933 | flu | 1112 | don |
| 168 | Arria | ela | 333 | Carda | dra | 520 | pal | 733 | Erige | acr | 934 | nia |
| 170 | Artem | abe | 335 | Cardu | cri | 522 | pal | 735 | can | 935 | ped | 1115 |
| 172 | mar | 337 | nui | 523 | Gladi | mar | 740 | Eriop | ang | 936 | pil | 1116 |
| 175 | vul | 340 | Gera | 525 | Gladi | per | 745 | Erodi | *cic | 940 | Gnap | 1117 |
| 176 | Arum | mac | 342 | acuta | 528 | Clema | vut | 753 | Eroph | *ver | 941 | uli |
| 182 | Asper | cyn | 343 | app | 530 | Cilno | vul | 759 | Erysi | cha | 948 | Gymna |
| 183 | odo | 344 | are | 532 | Cochi | ang | 762 | Euooy | eru | | | |
| 185 | Asple | adi | 350 | bia | 533 | dan | 763 | Eupat | can | | | |
| 192 | rut | 353 | can | 535 | off | | 764 | Eupho | amy | | | |
| 194 | tri | 357 | con | 537 | Coelo | vir | 766 | | *est | 885 | Hella | cha |
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Mainly marshes Filipendula ulmaria with surrounding willow hedges etc.

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| 8 | Accr | cam | 207 | Astra | dan | 381 | Carex | den | 538 | Colch | ant | 771 | Eupho | exi | 961 | Helic | pra |
| 5 | Accr | pse | 208 | | gly | 383 | | dia | 540 Conus mac | | 772 | | hel | 962 | | pub | |
| 6 | Accra | ant | 211 | Athyr | gl | 366 | | distans | 541 | Conop | naj | 773 | peplu | | | apr | |
| 7 | Accra | mlt | 212 | Atrip | gla | 357 | | disticha | 542 Conop naj | | 2213 | Euphr | agg | 976 | Hiera | phl | |
| 9 | | pla | 214 | | bas | 388 | | divisa | 543 Conop naj | | 783 | | ang | 979 | Hippo | com | |
| 12 | Acino | arv | 217 | | lit | 369 | | divulsa | 550 | Coron | var | 799 | neni | 980 | Hippo | ria | |
| 15 | Acoru | cal | 218 | | pat | 370 | | ech | 551 | Coron | did | 801 | | 881 | Hippu | lan | |
| 19 | Adosa | uos | 216 | | tab | 371 | | ela | 552 | | squ | 804 | pos | 983 | Holcu | van | |
| 20 | Aegop | pod | 220 | Avena | fat | 373 | | eri | 553 | Coryd | cla | | | 984 | | mol | |
| 21 | Aethu | hip | 221 | | lud | 374 | | eat | 554 | | lut | | | 988 | Honke | pep | |
| 22 | Agrop | cyo | | | | 375 | | 555 | 557 | Coryl | ave | 810 | Fagus | 989 | Horde | eur | |
| 22 | Agrop | eup | 224 | Balde | ran | 381 | | hir | 558 | Grata mor | | 813 | Festu | aru | 991 | Horde | mar |
| 23 | | odo | 225 | Ballo | nig | 382 | | bos | 570 | | oxy | 816 | | gig | 992 | | mur |
| 26 | Agrop | can | 226 | Berba vul | | 383 | | lae | 571 | Crepi | ble | 821 | | *ovi | 993 | | sec |
| 28 | | jun | 231 | Belli | per | 384 | | las | 572 | cap | | 823 | | pra | 995 | Hotto | pal |
| 32 | | pua | 232 | Berbe | vul | 385 | | lep | 578 | tar | | 824 | | *rub | 996 | Humil | lup |
| 33 | | rep | 234 | Berul | ere | 393 | | nig | 583 | Cuscu | epi | 830 | Filag | ger | 998 | Hydro | mor |
| 35 | Agros | can | 235 | Beta | mar | 396 | | 589 | 589 | epith | | 831 | | ruin | 999 | Hydro | vul |
| 36 | | gig | 240 | Betul | pub | 397 | | ova | 592 | Cymba | inur | 834 | Filip | um | 1003 | Hyper | and |
| 39 | | sto | 239 | ver | | 393 | | pai | 596 | Cynog | off | 834 | | lut | 1004 | | cal |
| 40 | | ten | 241 | Blden | cor | 399 | | pal | 597 | Cynos | cri | 835 | Foeni | vul | 1006 | | dub |
| 41 | Alra | car | 242 | | tri | 400 | | panicea | | | | 836 | Fraga | ana | 1008 | | cio |
| 42 | | pra | 243 | Black | per | 401 | | panicula | 607 | Dacty | glo | 839 | | ves | 1011 | hirsutum | |
| 46 | AJuga | rep | 244 | Bleck | spi | 404 | | pen | 617 | Daphn | lau | 839 | Erang | aln | 1010 | | hum |
| 57 | Alche | ves | 245 | Blysm | com | 405 | | pil | 620 | Daucu | car | | | | 1014 | | per |
| 60 | | aan | 248 | Iotry | lun | 406 | | pol | 622 | Douba | care | 847 | Fumar | cap | 1015 | | pul |
| 62 | Alism | lan | 249 | Brach | pin | 407 | | pse | 623 | | de | 848 | | nuc | 1016 | | tot |
| 63 | | pla | 250 | syl | | 408 | | pul | 630 | Descu | sop | 854 | | off | 1018 | Hypoc | gla |
| 64 | Althe | per | 251 | Brasa | nap | 412 | | rein | 434 | Desma | mar | 856 | | par | 1020 | | rad |
| 73 | Alliu | urs | 452 | nig | | 413 | | nig | 435 | | rig | 858 | | vai | | | |
| 76 | | vin | 253 | | ole | 414 | | ros | 640 | Digit | pur | | | | 1022 | Iberi | ama |
| 77 | Althe | glo | 254 | rap | | 419 | | scr | 814 | Diplo | mur | | | | 1023 | Ilex | aqu |
| 79 | Alope | aeq | 256 | Briza | ned | 421 | | syl | 643 | | ten | 862 | Galco | lut | 1030 | Isula | con |
| 82 | | gen | 258 | Brionu | arv | 424 | | ves | 646 | Dipsa | ful | 863 | Galco | ang | 1036 | Iris | loc |

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| 84 | myo | 282 | | com | 427 | Carli | vul | 647 | | pil | 867 | | spe | 1039 | | pse | set |
| 85 | pra | 288 | | lep | 428 | Carb | bet | 637 | Drose | rot | 868 | | *let | 1047 | Isola | | son |
| 87 | Altha | off | 289 | *mol | 432 | Casta | sat | 661 | Dryop | aus | 871 | Galin | par | | | | |
| 97 | Ammop | are | 270 | | mol | 433 | Castab | are | 664 | | 872 | Gallu | ang | 1048 | Jasio | mon | |
| 98 | Anaca | pyr | 271 | | rac | 440 | Centu | cya | 666 | *nl | | | ang | 1050 | Juncu | aquil | |
| 99 | Anaga | arv | 273 | | sec | 444 | | nig | | | 875 | | eru | 1054 | | | |
| 100 | | ten | 275 | | tho | 443 | | ac | | | 877 | | cru | 1057 | | bul | |
| 105 | Anemo | nem | 276 | Bryon | dio | 451 | Centu | min | 670 | *Ecliu | vul | 878 | | ber | 1058 | | *bul |
| 108 | | pul | 283 | Buteon | umb | 453 | | pul | 673 | Eleoc | aci | 879 | | *mol | 1062 | | com |
| 109 | Althe | syl | 291 | Gakli | mar | 456 | Centu | min | 674 | | mul | 880 | mal | 1063 | | | |
| 113 | Anisa | ste | 292 | Calain | can | 457 | Cepha | dau | 675 | | pal | 881 | pal | 1067 | | | off |
| 117 | Anthra | arv | 293 | | epi | 461 | Ceras | arv | 677 | | pau | 880 | | tri | 1069 | | gor |
| 118 | | cot | 296 | Calam | ase | 468 | | glo | 678 | | uni | 882 | pal | 1070 | | | int |
| 121 | Antho | odo | 298 | | nep | 469 | | seni | 679 | Eleg | flu | 883 | | ver | 1072 | | mar |
| 123 | Anthr | neg | 2249 | Calli | agg | 462 | | tet | 681 | Elode | can | 891 | Gentl | ang | 1073 | | aqu |
| 125 | | syl | 303 | | int | 467 | | vul | 682 | Elymu | are | 893 | | tin | 1074 | | sec |
| 128 | Anthy | vul | 304 | | obt | 471 | Cerat | den | 687 | Eindyn | non | 897 | Genti | *ama | 1077 | | ten |
| 128 | Antir | oro | 407 | | sta | 474 | Clasen | min | 688 | Epilo | ade | 906 | Geran | col | 1080 | Jenit | com |
| 131 | Aphe | *arv | 305 | | ver | 475 | | | 689 | | adu | 907 | | dis | | | |
| 132 | | arv | 309 | Callu | vul | 477 | Chama | ang | 690 | | | 909 | | luc | 455 | Menit | rub |
| 133 | | mle | 440 | Gentl | par | 490 | Cheli | tnaj | 694 | | tan | 911 | | mol | 1082 | Nickx | ela |
| 134 | Apium | gra | 2248 | Calya | *sep | 481 | Cheno | *alb | 695 | | mon | 914 | | pra | 1083 | | spu |
| 135 | | inu | 311 | | sol | 484 | | bon | 696 | | obs | 916 | | pus | 1084 | Knaut | arv |
| 137 | | nod | 312 | | sol | 487 | | fic | 697 | | pal | 917 | | pyr | 1087 | Koele | gra |
| 142 | Arabi | tha | 313 | | syl | 493 | | pol | 698 | | par | 918 | | rob | | | |
| 146 | Arabi | hir | 315 | Campa | glo | 502 | Chrys | leu | 700 | | ros | 919 | | rot | 1094 | Lactu | scr |
| 150 | Arcti | agg | 321 | | rap | 503 | | par | 705 | Epipa | bel | 920 | | ran | 1095 | | vir |
| 151 | | lep | 320 | rapunculo | | 504 | | seg | 708 | | pal | 923 | Geuni | | 1096 | Camir | alb |
| 152 | | min | 322 | | rot | 506 | Chrys | opp | 710 | | sec | 924 | | riv | 1099 | | ath |
| 153 | | vul | 323 | | tra | 508 | Cicho | int | 712 | Squis | | 925 | | urb | 1100 | | hyb |
| 163 | Arena | lep | 325 | Capse | bur | 513 | Cirea | lut | 713 | | du | 929 | Glauc | dar | 1103 | | pur |
| 161 | | *ser | 327 | Carda | ama | 514 | Clini | aca | 717 | | pal | 930 | Glaux | mar | 1104 | Lapsa | con |
| 162 | | ser | 328 | | de | 515 | | aca | 721 | | tei | 931 | Glaux | dec | 1107 | Latib | aqu |
| 166 | Armer | mar | 329 | | hir | 518 | | dis | 726 | Erica | cin | 932 | Glyce | dec | 1108 | Latib | aph |
| 167 | Armer | rus | 334 | | pse | 517 | | eri | 731 | | ter | 933 | | flu | 1112 | | mon |
| 169 | Arthe | ela | 333 | Carda | dra | 520 | | pal | 733 | Eriga | acr | 934 | | ana | 1114 | | nie |
| 170 | Artem | aba | 335 | Cardu | cri | 522 | | vul | 735 | | can | 935 | | ped | 1115 | | pal |
| 172 | | mar | 337 | | nui | 523 | Cladi | mas | 740 | Eriop | ang | 936 | | | 1116 | | |
| 175 | | vul | 344 | Carda | aca | 525 | Clayt | per | 745 | Erod | *vic | 940 | Gnaph | ayi | 1117 | | syl |
| 176 | Arum | mac | 340 | | acuta | 528 | Ciera | vit | 753 | Erodi | *var | 941 | | syl | 1123 | Lemna | gib |
| 182 | Asper | cyn | 342 | | app | 530 | Cilno | vul | 759 | Erysi | che | 948 | Gymna | con | 1128 | | min |
| 183 | | odo | 344 | | are | 532 | Cochl | ang | 760 | Erysi | che | | | | 1127 | | pol |
| 185 | Asple | adi | 350 | | bin | 533 | | dan | 763 | Eupat | can | | | | 1128 | | tri |
| 192 | | rut | 353 | | car | 535 | | off | 764 | Eupho | am | 952 | Heder | por | 1129 | Leont | aut |
| 194 | | tri | 357 | | con | 537 | Coelo | vis | 769 | | *estu | 955 | Hella | cha | 1130 | | his |
| 204 | Aster | tri | 358 | | con | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | |
|------|--------|------|------|-------|------|------|-------|------|------|-------|---------|------|--------|------|------|----------|------|
| 1131 | Leont | ley | 1343 | Nard | pas | 1614 | Polyg | ser | 1697 | Ribes | uva | 1906 | Serra | tin | 2091 | Trifo | pra |
| 1132 | Lepid | can | 1344 | Nardu | str | 1515 | | vul | 1701 | Korip | amp | 1912 | Sbera | arv | 2092 | | rep |
| 1137 | | rud | 1345 | Narth | osa | 1611 | Polyg | amp | 1703 | | isl | 1915 | Siegl | dec | 2094 | | aca |
| 1139 | | ani | 1346 | Nastu | mic | 1522 | | *avi | 1704 | | syi | 1916 | Silau | ail | 2095 | | squ |
| 1144 | Ligus | vul | 1348 | | *oil | 1523 | | bis | 1705 | Rosa | agg | 1923 | Silen | cuc | 2097 | striatum | |
| 1147 | Limn | bel | 1347 | | oil | 1527 | | con | 1707 | | arv | 1932 | Sinap | alb | 2101 | Trigl | mar |
| 1148 | | bis | 1349 | o z m | | 1530 | | hyd | 1708 | | *can | 1933 | | arv | 2102 | | pal |
| 1149 | | hum | 1352 | Nepet | nld | 1531 | | lap | 1711 | | *rub | 1934 | Sison | amo | 2105 | Trise | fla |
| 1154 | | vul | 1353 | Nepet | cat | 1535 | | mit | 1719 | | spi | 1935 | Sisaym | alt | 2109 | Tussi | far |
| 1161 | Linar | rep | 1356 | Nupha | lut | 1536 | | nod | 1720 | | sty | 1938 | | off | 2110 | Typha | ang |
| 1164 | | vul | 1358 | Nymph | alb | 1537 | | per | 1722 | | *vul | 1939 | | ori | 2111 | | lat |
| 1169 | Linum | cat | 1360 | Nymph | pel | 1544 | Polyp | vul | 1726 | Rubus | crae | 1944 | Sium | lat | | | |
| 1173 | Liste | ova | | | | 1546 | Polys | lob | 1728 | | *fru | 1945 | Smyrn | olu | 2112 | Olex | eur |
| 278 | Litho | off | 1361 | Odont | ver | 1548 | | set | 1729 | | lda | 1947 | Solan | dul | 2114 | | min |
| 1174 | | off | 1362 | Oenan | aqu | 1549 | Popul | alb | 1735 | Rumex | | 1948 | | nig | 2119 | Ulinus | gla |
| 1182 | Lollu | nul | 1363 | | cro | 1551 | | can | | | *ace | 1951 | Solid | vir | 2122 | | pro |
| 1183 | | per | 1364 | | sis | 1554 | | nig | 1736 | | ace | 1952 | Sonch | arv | 2128 | Urtic | mo |
| 1188 | Lonic | per | 1365 | | flu | 1550 | | ser | 1734 | | acetosa | 1953 | | asp | 2128 | | ure |
| 1191 | Lotus | cor | 1368 | | lac | 1553 | | tre | 1741 | | con | 1954 | | ole | 2132 | Utric | *vul |
| 1193 | | ten | 1370 | Oenot | bis | 1561 | Polam | col | 1742 | | crispus | 1957 | Sorbu | *ari | | | |
| 1194 | | ull | 1375 | Onobr | vic | 1563 | | cri | 1745 | | hyd | 1960 | | auo | 2136 | Vacci | myr |
| 1201 | Luzul | cam | 1377 | Ononi | rep | 1564 | | den | 1747 | | mar | 1962 | Sparg | mln | 2139 | Valer | dio |
| 1202 | | lor | 1378 | | api | 1569 | | luc | 1748 | | obt | 1981 | | ram | 2140 | | den |
| 1204 | | mul | 1379 | Onopo | aca | 1570 | | nat | 1749 | | pal | 1983 | | sim | 2143 | Valer | off |
| 1207 | | pil | 1381 | Ophio | vul | 1571 | | pec | 1751 | | pul | 1986 | Spart | tow | 2145 | | loc |
| 1209 | | syl | 1382 | Uphry | api | 1573 | | per | 1753 | | san | 1987 | Specu | hyb | 2146 | | rim |
| 1210 | Lycba | ne | 810 | Orchi | eri | 1576 | | pol | 1756 | | ten | 1991 | Sperg | arv | 2150 | Verba | nig |
| 1211 | Lyciu | chi | 608 | | luc | 1577 | | pra | 1760 | Ruscu | acu | 1992 | | marg | 2157 | Thapsus | |
| 1212 | | bal | 1337 | | mas | 1583 | Poten | ang | | | | 1992 | | rub | 2159 | Verbe | off |
| 1216 | Lycop | arv | 1339 | | mor | 1584 | | ans | 1761 | Bagin | ape | 1990 | | sal | 2161 | Veron | agr |
| 1219 | Lycop | cur | 1393 | Origa | vul | 1585 | | arg | 1762 | | cil | 1997 | Spira | api | 2163 | | ana |
| 1221 | Lyciu | nera | 1396 | Ornit | umb | 1588 | | ere | 1763 | | mar | 2001 | Stach | arv | 2165 | | arv |
| 1222 | | num | 1397 | Ornit | per | 1592 | | pal | 1766 | | nod | 2001 | | off | 2166 | | bec |
| 1225 | | vul | 1401 | Oroba | ela | 1594 | | rep | 1767 | | pro | 2001 | | pal | 2167 | | cat |
| 1227 | Lytba | set | 1404 | | min | 1596 | | ite | 1771 | Sagit | sag | 2005 | | syi | 2168 | | cha |
| | | | 1413 | Oxali | ace | 1597 | | tab | 2242 | Salic | agg | 2007 | Stell | ala | 2171 | | bed |
| 1228 | Mahon | aqu | 1424 | Papav | arg | 1598 | Poter | pol | 1784 | Salla | alb | 2008 | | ape | 2172 | | mon |
| 1230 | Bialus | syl | 1426 | | dub | 1599 | | san | 1787 | | aur | 2009 | | gra | 2173 | | off |
| 1232 | Malva | uos | 1427 | | hyb | 1600 | Primu | ela | 1788 | | cap | 2010 | | bol | 2175 | | per |
| 1235 | | neg | 1430 | | rbo | 1605 | | ver | 1789 | | *cin | 2011 | | *med | 2176 | | pol |
| 1236 | | syl | 1435 | Parie | dif | 1607 | | vul | 1793 | | fra | 2012 | | med | 2179 | | scu |
| 1238 | Marru | vul | 1436 | Paria | qua | 1610 | Prune | vul | 1801 | | pur | 2013 | | neg | 2180 | | ser |
| 1239 | Matri | cha | 1437 | Parna | pal | 1611 | Prunu | avi | 1802 | | rep | 2015 | | pal | 2184 | Vibur | lan |
| 1241 | | mar | 1440 | Pasti | sat | 1614 | | dom | 1804 | | tri | 2018 | Suaed | tru | 2185 | | opu |
| 1242 | | mat | 1441 | Pedic | pal | 1616 | | pad | 1805 | | vim | 2019 | | mar | 2186 | Vicia | ang |
| 1247 | Medic | ara | 1442 | | syl | 1617 | | spi | 1806 | Salso | kal | 2021 | Succi | pra | 2189 | | cra |

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| | | | | | | | | | | | | | | | | | |
|------|-------|------|-------|-------|------|-------|-------|---------|-------|-------|------|-------|-------|--------|------|--------|-----|
| 1248 | fal | 1443 | Penta | sem | 1619 | Pteri | aqu | 1809 | Salvi | bor | 2024 | Symph | off | 2191 | | bir | |
| 1249 | bis | 1444 | Pepli | por | 1620 | Pucci | dis | 1814 | Sambu | ebu | | | | 2194 | | lat | |
| 1250 | lup | 1446 | Petas | fra | 1622 | | mar | 1815 | | nig | 2032 | Tamus | com | 2197 | | sat | |
| 1252 | sat | 1447 | | hyb | 1623 | Pulic | dys | 1817 | Samol | val | 2033 | Tanac | vul | 2198 | | sep | |
| 1253 | var | 1450 | Petro | seg | | | | 1818 | Sangu | oil | 2034 | Tarax | *agg | 2201 | | tenuis | |
| 1256 | Melan | pra | 1453 | Peuce | pal | 1638 | Querc | pet | 1819 | Sanic | cur | 2036 | | *joe | 2202 | | tet |
| 1258 | Melan | sil | 1454 | | ero | 1640 | | rub | 1821 | Sapoa | off | 2037 | | *off | 2204 | Vinca | maj |
| 1261 | | noc | 1459 | Pbleu | are | | | | 1822 | Sarot | seo | 2039 | Tarus | bac | 2205 | | min |
| 1259 | | rub | 1461 | | nod | 1641 | Radio | lin | 1830 | Saxil | gra | 2041 | Tescl | nud | 2206 | Viola | arv |
| 1263 | Medic | uni | 2247 | *pra | | 1642 | Ranun | acr | 1843 | | coi | 2046 | Teucr | | 2207 | | can |
| 1264 | Meil | alb | 1463 | | pra | 1643 | | aqu | 1846 | Scabi | coi | | | scorod | 2210 | | bir |
| 1265 | | alt | 1465 | Phrag | com | 1644 | | arv | 1847 | Scand | pec | 2048 | Thali | fla | 2214 | | odo |
| 1267 | | off | 1466 | Phyll | aco | 1645 | | aur | 1851 | Schoe | lac | 2049 | | mla | 2215 | | pal |
| 1272 | Mentb | aqu | 1471 | Picri | ech | 1647 | | bul | 1852 | | tab | 2052 | Thely | pal | 2217 | | rei |
| 1273 | | arv | 1472 | | bis | 1648 | | cir | 1853 | Schoe | nig | 2058 | Thlas | arv | 2218 | | tri |
| 1289 | Menya | tri | 1475 | Pimpi | maj | 1649 | | lic | 1860 | Scirp | mar | 2060 | Thymu | dru | 2220 | | tri |
| 1290 | Nercu | ann | 1476 | | sax | 1651 | | flamula | 1861 | | syl | 2061 | | pul | 2223 | Viscu | alb |
| 1291 | | per | 1481 | Pingu | vul | 1652 | | llu | 1862 | Scler | ann | 2063 | Tilla | cor | 2225 | Vulpi | amb |
| 1296 | Millu | ed | 1484 | Pinus | syl | 1653 | | bed | 1863 | Scler | ann | 2064 | | pla | 2226 | | bro |
| 1303 | Ninua | ten | 1485 | Plant | cor | 1654 | | len | 1867 | | nod | 2065 | | vul | 2227 | | mem |
| 1305 | Muehr | tri | 1487 | | lan | 1659 | | par | 1872 | Scute | gal | 2067 | Tilla | nus | 2228 | | myc |
| 1307 | Molin | cae | 1488 | | maj | 1660 | | repens | 1875 | Sedum | ocr | 2068 | Turil | arv | | | |
| 1312 | Monti | *fon | 1489 | | mar | 1662 | | sax | 1877 | | arv | 2069 | | jap | 2237 | Zanni | pal |
| 1315 | Mycel | mur | 1490 | | med | 1663 | | see | 1881 | | ref | 2070 | | nod | 263 | Zerna | ere |
| 1317 | Myoso | arv | 1492 | Plata | bil | 1664 | | tri | 1885 | | tel | 2074 | Trago | pra | 272 | | ram |
| 1318 | | cae | 1493 | | chl | 1667 | Rapha | rap | 1891 | Senec | aqu | 1858 | Trich | cae | | | |
| 1321 | | dis | 1495 | Poa | ann | 1672 | Resed | lut | 1896 | | eru | 2077 | Trilo | arv | | | |
| 1320 | | bis | 1499 | | com | 1673 | | luteola | 1898 | | int | 2080 | | can | | | |
| 1322 | | pal | 1504 | | sem | 1675 | Rbanu | cat | 1899 | | jac | 2081 | | dub | | | |
| 1326 | Myoso | aqu | 1506 | | pra | 1678 | Rhina | *mini | 1902 | | aqu | 2083 | | fra | | | |
| 1323 | Myric | gal | 1507 | | tri | 1691 | Rhync | alb | 1903 | | syb | 2087 | | med | | | |
| 1331 | Myrio | spi | 1512 | Polyg | cal | 1694 | Ribes | nig | 1904 | | vis | 2088 | | mic | | | |
| 1332 | | ver | 1513 | | oxy | 1696 | | syl | 1905 | | vul | 2090 | | och | | | |

Other Species

visits: 8/6/78 T.J.

Sedge field + road hed + alder cos

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|------|--------|------|------|-------|------|------|-------|------|------|---------|---------|------|-------|------|------|----------|------|
| 1131 | Laont | ley | 1343 | Marci | pas | 1614 | Polys | ser | 1697 | Ribes | tin | 1906 | Serra | tin | 2081 | Trifo | pra |
| 1132 | Lapid | cain | 1344 | Nardu | str | 1615 | Polys | vul | 1701 | Ronip | ausp | 1912 | Shera | arv | 2092 | | pra |
| 1137 | | rud | 1345 | Narib | cas | 1624 | Polys | amp | 1703 | | isl | 1915 | Siegl | doc | 2094 | | rep |
| 1139 | Ligul | sunl | 1346 | Nastu | mic | 1322 | | *avi | 1704 | | isl | 1918 | Silau | ail | 2095 | | sca |
| 1144 | Ligul | vul | 1348 | | *off | 1323 | | bis | 1705 | Rosa | agg | 1923 | Silen | cuc | 2097 | stristum | mar |
| 1147 | Lilium | bel | 1347 | | off | 1327 | | con | 1707 | | arv | 1932 | Sinap | alb | 2101 | Trigl | pal |
| 1148 | | bin | 1349 | o a m | | 1330 | | hyd | 1709 | | *can | 1933 | | arv | 2102 | | pal |
| 1149 | | bum | 1352 | Neott | nid | 1331 | | lap | 1714 | | *rub | 1934 | Sison | amo | 2105 | Trise | fla |
| 1154 | | vul | 1353 | Nepet | cat | 1335 | | mit | 1719 | | spi | 1935 | Sisym | alt | 2109 | Tussl | far |
| 1161 | Linar | rep | 1356 | Nupha | lut | 1338 | | nod | 1720 | | sty | 1938 | | off | 2110 | Typha | ang |
| 1164 | | vul | 1358 | Nymph | alb | 1337 | | per | 1722 | | *vil | 1939 | | ori | 2111 | | lat |
| 1169 | Linum | cat | 1360 | Nymph | pel | 1344 | Polyp | vul | 1726 | Rubus | cae | 1944 | Sium | lat | | | |
| 1173 | Liste | ova | | | | 1346 | Polys | lob | 1729 | | fra | 1945 | Smyrn | olu | 2112 | Ulex | eur |
| 278 | Litbo | arv | 1361 | Odont | ver | 1349 | | set | 1729 | | ida | 1947 | Solan | dul | 2114 | | min |
| 1174 | | off | 1362 | Oenan | aq | 1349 | Popul | alb | 1735 | Rumex | | 1949 | | nig | 2119 | Ulmus | gla |
| 1182 | Lolul | niul | 1363 | | cro | 1351 | | can | | | *ace | 1951 | Solid | vir | 2122 | | pro |
| 1183 | | per | 1364 | | fis | 1354 | | nig | 1736 | | ace | 1952 | Sonch | arv | 2126 | Urtic | ure |
| 1188 | Lonic | per | 1365 | | flu | 1350 | | ser | 1736 | acetosa | | 1953 | | asp | 2128 | | *vul |
| 1191 | Lotus | cor | 1366 | | lac | 1355 | | tre | 1741 | | con | 1954 | | ole | 2132 | Utric | |
| 1193 | | tea | 1370 | Oenot | bis | 1361 | Potam | col | 1742 | | crispus | 1957 | Sorbu | *ari | | | |
| 1194 | | uli | 1375 | Oenob | vic | 1363 | | cri | 1745 | | byd K | 1960 | | auc | 2136 | Vacc | myr |
| 1201 | Luzul | cam | 1377 | Onou | rep | 1414 | | den | 1747 | | mar | 1982 | Sparg | min | 2139 | Valer | dio |
| 1202 | | lor | 1378 | | spi | 1369 | | luc | 1748 | | obt | 1981 | | ram | 2140 | | off |
| 1204 | | mul | 1379 | Onopo | aca | 1570 | | nat | 1749 | | pal | 1983 | | sim | 2143 | Valer | den |
| 1207 | | pil | 1381 | Opbio | vul | 1574 | | pec | 1751 | | pal | 1988 | Spec | tow | 2145 | | loc |
| 1209 | | syl | 1382 | Opbry | api | 1575 | | per | 1753 | | sul | 1988 | Specu | byc | 2146 | | rim |
| 1210 | Lycum | tho | 610 | Orchi | eri | 1576 | | pol | 1756 | | ten | 1987 | Sperg | arv | 2150 | Verba | nig |
| 1211 | Lyciu | chi | 608 | | luc | 1577 | | pra | 1760 | Ruscus | acu | 1991 | Sperg | marg | 2157 | thapsus | |
| 1212 | | bal | 1387 | | mas | 1583 | Poten | ang | | | | 1992 | | rub | 2159 | Verbe | off |
| 1218 | Lycop | arv | 1389 | | mor | 1584 | | | 1761 | Sagin | ape | 1990 | | sal | 2161 | Veron | agr |
| 1219 | Lycop | cur | 1393 | Origa | vul | 1585 | | arg | 1762 | | cil | 1997 | Spira | api | 2163 | | ana |
| 1221 | Lysim | nem | 1396 | Ornit | umb | 1588 | | ere | 1765 | | mar | 2001 | Stach | arv | 2165 | | arv |
| 1222 | | num | 1397 | Ornit | per | 1592 | | pal | 1766 | | nod | 217 | | off | 2166 | | bee |
| 1225 | | vul | 1401 | Oroba | ela | 1594 | | | 1767 | | pro | 2005 | | pyl | 2167 | | cat |
| 1227 | Lytbr | sal | 1404 | | min | 1596 | | ite | 1771 | Sagit | sag | 2006 | | ari | 2168 | | cha |
| | | | 1413 | Oxali | ace | 1597 | | tab | 2243 | Salic | agg | 2007 | Stell | als | 2171 | | bed |
| 1228 | Mahon | aqu | 1424 | Papav | arg | 1598 | Poter | pol | 1784 | Salix | alb | 2008 | | ape | 2172 | | mon |
| 1230 | Malva | syl | 1426 | | dub | 1599 | | san | 1787 | | aur | 2009 | | ape | 2173 | | off |
| 1232 | Malva | uos | 1427 | | hyb | 1600 | Primu | ela | 1788 | | cap | 2010 | | hol | 2175 | | per |
| 1233 | | oeg | 1430 | | rbo | 1605 | | ver | 1789 | | *cin | 2011 | | *med | 2176 | | pol |
| 1236 | | syl | 1435 | Parie | dif | 1607 | | vul | 1793 | | fra | 2012 | | med | 2179 | | scu |
| 1238 | Marru | vul | 1436 | Paris | qua | 1610 | Prune | vul | 1801 | | pus | 2013 | | neg | 2180 | | ser |
| 1239 | Matri | cha | 1437 | Parna | pal | 1611 | Pruna | avi | 1802 | | rep | 2015 | | pal | 2184 | Vibur | lan |
| 1241 | | mar | 1440 | Pasti | sat | 1614 | | donr | 1804 | | tri | 2018 | Suaed | fru | 2185 | | opu |
| 1242 | | mat | 1441 | Pedic | pal | 1616 | | pad | 1805 | | vim | 2019 | | mar | 2186 | Vicia | ang |
| 1247 | Medic | ara | 1442 | | syl | 1617 | | spr | 1806 | Salso | kal | 2021 | Succi | pra | 2187 | | can |

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|------|--------|------|------|-------|------|------|---------|--------|------|-------|------|------|-------|--------|------|-------|--------|
| 1248 | | fal | 1443 | Penta | sem | 1619 | Pteri | aqu | 1809 | Salvi | bor | 2024 | Synph | off | 2191 | | hir |
| 1249 | | bis | 1444 | Pepli | por | 1620 | Pucci | dis | 1814 | Sambu | ebu | | | | 2194 | | lat |
| 1250 | | lup | 1446 | Petas | fra | 1622 | | mar | 1815 | | neg | 2032 | Tamus | com | 2197 | | sat |
| 1252 | | sat | 1447 | | hyb | 1625 | Pulic | dys | 1817 | Samol | val | 2033 | Tanac | vul | 2198 | | sep |
| 1253 | | var | 1450 | Petro | seg | | | | 1818 | Sangu | oil | 2034 | Tarax | *agg | 2201 | | tenuis |
| 1256 | Melain | pra | 1453 | Peuce | pal | 1638 | Querc | pet | 1819 | Sanic | alb | 2036 | | *lae | 2202 | | tet |
| 1258 | Melan | ate | 1454 | Phala | ere | 1640 | | reb | 1821 | Sapon | off | 2035 | | *off | 2204 | Vinca | maj |
| 1261 | | noc | 1459 | Phleu | are | | | | 1822 | Sarot | soo | 2039 | Taxus | bac | 2205 | | min |
| 1259 | | rub | 1461 | | nod | 1641 | Radio | lin | 1830 | Saxil | gra | 2041 | Teesd | nud | 2208 | Viola | arv |
| 1263 | Melic | uni | 2247 | | *pra | 1642 | Itanun | acr | 1843 | | tri | 2040 | Teucl | | 2207 | | can |
| 1264 | Melil | alb | 1463 | | pra | 1643 | | aqu | 1840 | Scabi | con | | | scored | 2210 | | hir |
| 1265 | | alt | 1465 | Phleg | | 1644 | | arv | 1847 | Scand | pec | 2048 | Thali | da | 2214 | | odo |
| 1267 | | off | 1466 | Phyll | seo | 1645 | | aur | 1851 | Schoe | lac | 2049 | | min | 2215 | | pal |
| 1272 | Menth | aqu | 1471 | Picri | ech | 1647 | | bul | 1852 | | tab | 2052 | Thely | pal | 2217 | | rei |
| 1273 | | ary | 1472 | | bis | 1648 | | cir | 1855 | Schoe | nig | 2058 | Thlas | arv | 2218 | | riv |
| 1289 | Menya | tri | 1475 | Pimpi | maj | 1649 | | tic | 1860 | Scirp | nlar | 2060 | Thymu | dru | 2220 | | tri |
| 1290 | Mercu | ann | 1478 | | sax | 1651 | flamula | | 1861 | | ann | 2061 | | pul | 2223 | Viscu | alb |
| 1291 | | per | 1481 | Pingu | vul | 1652 | | flu | 1862 | Seler | ann | 2063 | Tilia | cor | 2225 | Vulpi | amb |
| 1296 | Miliu | eli | 1484 | Pinus | syl | 1653 | | bed | 1863 | | ann | 2064 | | pla | 2226 | | bro |
| 1303 | Minua | ten | 1485 | Plant | cor | 1654 | | len | 1869 | | not | 2065 | | vul | 2227 | | mem |
| 1305 | Moehr | tri | 1487 | | lan | 1659 | | par | 1872 | Scute | gal | 2067 | Tilia | nus | 2228 | | myc |
| 1307 | Molin | cae | 1488 | | naj | 1660 | | repens | 1875 | Sedum | acr | 2068 | Torii | | | | |
| 1312 | Monti | *fou | 1489 | | nlar | 1662 | | sar | 1877 | | acr | 2069 | | jap | 2237 | Zanni | pal |
| 1315 | Mycel | mur | 1490 | | med | 1663 | | sce | 1881 | | ref | 2070 | | nod | 263 | Zerna | ere |
| 1317 | Myoso | arv | 1492 | Plata | bif | 1664 | | tri | 1885 | | tel | 2074 | Trago | pra | 272 | | ram |
| 1319 | | cae | 1493 | | chl | 1667 | Rapha | rap | 1891 | Senec | acu | 1858 | Trich | cae | | | |
| 1320 | | his | 1495 | Poa | ann | 1672 | Kesed | lut | 1896 | | eru | 2077 | Trifo | arv | | | |
| 1322 | | pal | 1499 | | com | 1673 | luteola | | 1898 | | int | 2080 | | cam | | | |
| 1326 | Myoso | aqu | 1504 | | com | 1675 | Rhamn | cat | 1899 | | jac | 2081 | | dub | | | |
| 1328 | Myrc | gal | 1506 | | pra | 1678 | Rhina | *minn | 1902 | | squ | 2083 | | fra | | | |
| 1331 | Myrio | spi | 1507 | | tri | 1681 | Ichync | alt | 1903 | | syl | 2087 | | med | | | |
| 1332 | | ver | 1512 | Polys | cal | 1684 | Kibes | ing | 1904 | | vis | 2088 | | mic | | | |
| | | | 1513 | oay | | 1686 | | syl | 1905 | | vul | 2090 | | och | | | |

Other Species
Solidago serotina

visit 21/6/77 TJ/BRs

Lower Meadows

Nash

Grid Ref.
K 20 5290BITA (H.D. Wood) (BNT)
E. 2. Comp. 4.

| | |
|------|----------|
| Date | V.C. No. |
| 1974 | 20 |
| V.C. | HERTS |
| Alt. | Code No. |

 RECORDER
F. BENTLEY

LOCALITY FURWELL NINESPRINGS

MOSES

| | | | | | |
|------------|-----------|-------|-----------|-----------|-----------|
| Acac multi | virg | ruf | osmu | myur | Pleu acum |
| Acro cord | arge | schr | rulu | stri | subu |
| cusp | lana | squa | vari | Lept piri | Pleu squa |
| giga | bico | subu | Font anti | Lept smil | Pleu schr |
| sarm | caes | vari | Font anti | Lept flex | Pohl acum |
| sira | cana | denu | Font anti | Lept poly | albi |
| trif | doni | unci | Funa atte | Leuc glau | annot |
| Aloi aloi | eryt | crisp | Funa atte | Leuc sciu | crud |
| ambi | incl | blyt | Funa atte | Meas ulig | drum |
| rigl | inte | bonj | Funa atte | Mnju affi | elon |
| Ambl deal | mild | falc | Grim alpi | cinc cusp | ludw |
| Ambl conf | pallen | flag | Grim alpi | long | note |
| spru | palles | fusc | Grim alpi | marg | poly |
| comp | pend | maju | Grim alpi | orth | roth |
| vari | pseu | scop | Grim alpi | orth | alpe |
| Amph | blmu | scot | Grim alpi | orth | alpe |
| lapp | pseu | spur | Grim alpi | orth | alpe |
| moug | ulig | star | Grim alpi | orth | alpe |
| Andr alpi | warn | stri | Grim alpi | orth | alpe |
| roth | weig | foli | Grim alpi | orth | alpe |
| rupe | Camp lute | laev | Grim alpi | orth | alpe |
| Anoe comp | seri | mari | Grim alpi | orth | alpe |
| Anom | Camp | orbi | Grim alpi | orth | alpe |
| conc | chry | pate | Grim alpi | orth | alpe |
| filii | elod | pulv | Grim alpi | orth | alpe |
| Anom viti | poly | retr | Grim alpi | orth | alpe |
| Anti curt | prot | stri | Grim alpi | orth | alpe |
| Arch alte | somm | subs | Grim alpi | orth | alpe |
| Arct fulv | stel | torq | Grim alpi | orth | alpe |
| Atri cris | Camp alio | tric | Grim alpi | orth | alpe |
| Andr | brev | lycu | Grim alpi | orth | alpe |
| palu | flex | revo | Grim alpi | orth | alpe |
| comm | frag | int | Grim alpi | orth | alpe |
| conv | intr | revo | Grim alpi | orth | alpe |
| cyli | piri | send | Grim alpi | orth | alpe |
| fall | seti | unci | Grim alpi | orth | alpe |
| ferr | schw | vern | Grim alpi | orth | alpe |
| horn | subu | cili | Grim alpi | orth | alpe |
| nith | Camp saxi | rhab | Grim alpi | orth | alpe |
| recu | con | stre | Grim alpi | orth | alpe |
| ref | purp | vulg | Grim alpi | orth | alpe |
| revo | Cinc styg | orth | Grim alpi | orth | alpe |
| rigi | Cinc font | recu | Grim alpi | orth | alpe |
| spad | mucr | serr | Grim alpi | orth | alpe |
| toph | Cirr cras | minu | Grim alpi | orth | alpe |
| trif | pili | serr | Grim alpi | orth | alpe |
| uqu | Clim dend | toze | Grim alpi | orth | alpe |
| vine | Cono tetr | vert | Grim alpi | orth | alpe |
| hali | Crai | atop | Grim alpi | orth | alpe |
| liby | comm | mega | Grim alpi | orth | alpe |
| pomi | comm | pra | Grim alpi | orth | alpe |
| cris | falc | stok | Grim alpi | orth | alpe |
| pami | vire | ripa | Grim alpi | orth | alpe |
| Blin acut | filii | schl | Grim alpi | orth | alpe |
| Brac tric | Cryp hete | schl | Grim alpi | orth | alpe |
| Brac albi | Cten moll | schl | Grim alpi | orth | alpe |
| glar | cond | stri | Grim alpi | orth | alpe |
| mild | moll | stri | Grim alpi | orth | alpe |
| plum | Cyno brun | hamu | Grim alpi | orth | alpe |
| popu | jenn | impo | Grim alpi | orth | alpe |
| rivu | Desm | pati | Grim alpi | orth | alpe |
| tate | conv | depr | Grim alpi | orth | alpe |
| safe | Dich pell | eleg | Grim alpi | orth | alpe |
| velu | flav | muel | Grim alpi | orth | alpe |
| Breu chry | pell | pulc | Grim alpi | orth | alpe |
| Bryu | Dicr cerv | seli | Grim alpi | orth | alpe |
| alpi | crispa | holt | Grim alpi | orth | alpe |
| alpi | hete | myos | Grim alpi | orth | alpe |

LOCALITY
WATER WINE SPRING WOOD
(Comp. 4)

DATE
1978-20

SOUTH EAST
V.C. N

HABITAT
ALDER SWAMP

V.C.
HERTS

Alt. Code No.

| | | | | | | | | | | | | | | | | | |
|-----------|-------------------|----------------|------|------------|-------|--------|-------|----------|-------|--------|-------|-------|-----------|--------|------|----------|------|
| 8 | Acer | cam | 207 | Astra | dan | 361 | Carex | dein | 538 | Colch | ant | 771 | Eupho | exi | 961 | Helle | pra |
| 6 | Acer | pas | 208 | | gly | 363 | | dia | 840 | Coniu | mac | 772 | | hel | 962 | | pub |
| 8 | Acer | ant | 211 | Athy | gl | 368 | | distans | 541 | Conop | maj | 777 | | peplus | 968 | Herac | spil |
| 7 | Achil | mil | 212 | Atrip | gl | 367 | | disticha | 514 | Convo | ar | 2243 | Euphr | agg | 970 | Hiera | pil |
| 9 | | pta | 214 | | bas | 368 | | divisa | 548 | Cornu | san | 783 | | ang | 979 | Hippo | com |
| 12 | Acino | arv | 217 | | lit | 369 | | divulsa | 550 | Coron | var | 798 | | nem | 980 | Hippo | rha |
| 15 | Acoru | cal | 218 | pat | 370 | | | ech | 551 | Coron | dif | 801 | | pse | 981 | Hippo | vul |
| 19 | Adosa | mos | 216 | sab | 371 | | | ela | 552 | | squ | 804 | | roa | 983 | Holcu | lan |
| 20 | Aegop | pod | 220 | Avena | lat | 373 | | eri | 555 | Coryd | cla | | | | 984 | | mol |
| 22 | Aescu | bip | 221 | | lud | 374 | | east | 556 | | lut | | | | 988 | Honda | pep |
| 21 | Aethu | cyn | | | | 378 | | baeca | 559 | Coryd | ant | 810 | Fagus | syl | 989 | Horda | eur |
| 22 | Agrin | eup | 224 | Balde | ran | 381 | | bir | 560 | Crata | mon | 813 | Festu | aru | 991 | Horda | mar |
| 23 | | odo | 225 | Ballo | nig | 382 | | bon | 570 | | oay | 816 | | gic | 992 | | mar |
| 26 | Agrop | can | 229 | Barba | vul | 385 | | lae | 571 | Crepi | bis | 821 | | ovi | 993 | | sec |
| 28 | | jun | 231 | Beill | per | 386 | | las | 572 | | cap | 823 | | pra | 995 | Hotto | pal |
| 32 | | pue | 232 | Berbe | vul | 387 | | lep | 578 | | tar | 824 | | rub | 996 | Humul | lup |
| 33 | | rep | 234 | Berul | ere | 393 | | nig | 583 | Cuscu | epi | 830 | Filag | ger | 998 | Hydro | mor |
| 35 | Agros | can | 235 | Beta | mar | 396 | | otr | 589 | | cpith | 831 | | ruin | 999 | Hydro | vul |
| 36 | | gig | 240 | Betul | pub | 397 | | ova | 592 | Cymba | mur | 834 | | | 1003 | Hyper | and |
| 39 | | sto | 239 | | ver | 398 | | pai | 598 | Cynog | oil | 834 | | vul | 1004 | | cal |
| 40 | | ten | 241 | Diden | cer | 399 | | pal | 597 | Cynos | cri | 835 | Foeni | vul | 1008 | | dub |
| 41 | Aira | car | 242 | | tri | 400 | | panicea | 598 | | | 836 | Fraga | ana | 1008 | | elo |
| 42 | | pra | 243 | Black | per | 401 | | panicea | 607 | Dacty | glo | 839 | | ves | 1010 | lirantim | |
| 43 | Ailaco | rep | 244 | Dlech | spi | 404 | | pen | 617 | Diapun | lau | 839 | Frang | aln | 1011 | | bum |
| 57 | Alche | ves | 245 | Dlysm | com | 405 | | pil | 620 | Daucu | car | 841 | Fest | ana | 1014 | | per |
| 60 | | xan | 248 | Eotry | lun | 406 | | poi | 625 | Drach | car | 847 | Fumar | cap | 1015 | | pul |
| 62 | Alism | lan | 249 | Brach | pin | 407 | | pse | 628 | | de | 849 | | nuc | 1016 | | tet |
| 63 | | pla | 250 | | ayl | 408 | | rip | 630 | Descu | sop | 854 | | off | 1018 | Hypoc | gla |
| 64 | Allia | pet | 251 | Brass | nep | 412 | | rein | 434 | Desuna | mar | 856 | | par | 1020 | | rad |
| 75 | Alliu | urs | 252 | | nig | 413 | | rip | 435 | | rig | 858 | | val | | | |
| 76 | | vin | 253 | | ole | 414 | | ros | 640 | Digit | pur | | | | | | |
| 77 | Allium | gla | 254 | | rap | 419 | | scr | 641 | Diplo | mur | | | | | | |
| 79 | Alope | aeq | 256 | Briza | nud | 421 | | ayl | 645 | | ten | 862 | Galco | lut | 1022 | Iberi | ama |
| 82 | | gen | 258 | Brounu | arv | 424 | | ves | 646 | Dipsa | ful | 863 | Galco | ang | 1030 | Iris | con |
| FOLD HERE | | | | | | | | | | | | | | | | | |
| 84 | myo | 262 | corn | 427 | Carl | vul | 867 | spe | 867 | spe | 1038 | pas | | | | | |
| 85 | pra | 268 | lep | 488 | Crapi | bas | 868 | par | 868 | par | 1047 | Isola | set | | | | |
| 87 | Altha | off | 269 | *mol | 432 | Casta | sat | 871 | Galim | 871 | Galim | | | | | | |
| 97 | Armopare | 270 | mol | 433 | Catab | argu | 872 | ang | 872 | Galim | 1048 | Jasio | ruon | | | | |
| 98 | Anaca | pyr | 271 | rac | 440 | Centa | cya | 873 | api | 873 | api | 1050 | Juncuacul | | | | |
| 99 | Anaga | arv | 273 | sec | 441 | | nig | 875 | | 875 | eru | 1054 | | art | | | |
| 100 | | ten | 275 | tho | 440 | | aca | 877 | | 877 | ere | 1057 | | bul | | | |
| 105 | Anemo | sem | 278 | Dryon | dio | 451 | Centa | min | 670 | Eclid | vul | 878 | | ber | 1058 | *bul | |
| 108 | | pul | 283 | Duton | umb | 453 | | pul | 673 | Eleoc | ad | 879 | | *mol | 1062 | com | |
| 113 | Anisa | ste | 291 | Bakil | mar | 456 | Centu | min | 674 | | mul | 880 | | mol | 1063 | con | |
| 117 | Anthe | arv | 292 | Calain | can | 457 | Cepha | dum | 675 | | pal | 882 | | pal | 1067 | ed | |
| 118 | | col | 293 | | epi | 461 | Ceras | ayl | 677 | | pau | 886 | | tri | 1069 | ger | |
| 121 | Anibo | odo | 296 | Calam | asc | 468 | | glo | 678 | | uni | 887 | | uli | 1070 | inf | |
| 123 | Anthr | neg | 298 | nep | 469 | | seni | | 679 | Eleg | flu | 888 | | ver | 1072 | mar | |
| 125 | | syl | 303 | agg | 462 | | tet | | 681 | Elode | can | 891 | Genis | ang | 1073 | squ | |
| 128 | Anthy | vul | 304 | obt | 471 | Cerat | dem | | 682 | Elymu | are | 893 | | tin | 1078 | sub | |
| 128 | Anir | oro | 307 | sta | 474 | Chacn | min | | 687 | Endym | non | 897 | Genti | ana | 1077 | ten | |
| 131 | Aphas | *arv | 305 | ver | 477 | Chama | ang | | 689 | Epilo | ade | 906 | Ceran | col | 1080 | Junip | com |
| 132 | | arv | 309 | Callu | vul | 477 | Chama | ang | 690 | | | 907 | | tuc | 455 | Kentr | rub |
| 133 | | mic | 310 | Callu | vul | 480 | Cheli | inaj | 694 | | lan | 911 | | inn | 1082 | Kicka | ela |
| 134 | Apium | gra | 312 | Calys | *sep | 481 | Cheno | *alb | 695 | | mon | 914 | | pra | 1083 | | spa |
| 135 | | lau | 311 | sep | 484 | | bon | | 696 | | obs | 916 | | pua | 1084 | Knaut | arv |
| 142 | Arabi | tha | 312 | sol | 487 | | fic | | 697 | | pal | 917 | | pyr | 1087 | Kocle | gra |
| 146 | Arabi | hir | 313 | ayl | 493 | | pol | | 698 | | par | 918 | | rob | | | |
| 150 | Arcti | agg | 315 | Campa | glo | 502 | Chrys | leu | 700 | | ros | 919 | | rot | 1094 | Lactu | scr |
| 151 | | lap | 320 | raspunculo | 304 | | seg | | 705 | Epipa | bel | 920 | | run | 1095 | | vir |
| 152 | | min | 322 | rot | 506 | Chrys | opp | | 708 | | pal | 923 | Geonu | | 1098 | Laninu | alb |
| 153 | | vul | 323 | tra | 509 | Cichu | int | | 710 | | ses | 924 | | riv | 1099 | | simp |
| 163 | Arena | lep | 325 | Capse | bur | 513 | Circa | vit | 712 | Equia | arv | 925 | | urb | 1100 | | hyb |
| 161 | | *ser | 327 | Casta | ama | 514 | Cirui | aca | 713 | | flu | 929 | Glauc | da | 1103 | | pur |
| 162 | | ser | 328 | de | 515 | | | | 717 | | pal | 930 | Glauc | nar | 1104 | Lapsa | con |
| 166 | Armer | mar | 329 | hir | 516 | | dis | | 721 | | tel | 931 | Gloch | hed | 1107 | Lathr | squ |
| 167 | Armer | rus | 331 | pra | 517 | | eri | | 726 | Erica | cin | 932 | Glyce | doc | 1108 | Lathy | aph |
| 169 | Arria | ela | 333 | Carda | dra | 522 | | pal | 731 | | tet | 933 | | du | 1112 | | mon |
| 170 | Artem | abs | 335 | Cardu | cri | 522 | | vul | 733 | Erige | acr | 934 | | mas | 1114 | | nls |
| 172 | | mar | 337 | nut | 523 | Cladi | mar | | 735 | | can | 935 | | ped | 1115 | | pal |
| 175 | | vul | 341 | Carex | acu | 525 | Clayt | per | 740 | Eriop | ang | 936 | | pili | 1116 | | pra |
| 176 | Arum | mac | 340 | acuta | 528 | Cleina | vit | | 745 | Eriop | *cic | 940 | Gnapb | syl | 1117 | | ayl |
| 182 | Asper | eyn | 342 | app | 530 | Climo | vul | | 759 | Erysi | che | 941 | | uli | 1123 | Lemas | gib |
| 183 | | odo | 344 | are | 532 | Cochl | ang | | 762 | Euony | eur | 948 | Gymna | con | 1126 | | min |
| 185 | Aspie | adi | 350 | bin | 533 | | off | | 763 | Eupat | can | | | | 1127 | | pol |
| 182 | | rut | 355 | car | 535 | | dan | | 764 | Eupho | amy | 949 | Malim | por | 1128 | | tri |
| 184 | | tri | 357 | con | 537 | Coelo | vir | | 769 | | *esu | 952 | Thede | bal | 1129 | Leont | aut |
| 204 | Aster | tri | 359 | cur | | | | | | | | 953 | Helia | cha | 1130 | | lis |

Alder Wood

Aldas Swamp

Diane
Fortesane

1982

SUMMARY OF AQUATIC FAUNA FOUND AT PURWELL NINESPRINGS

Where found

| | Northern Ponds | Northern ditches | River Purwell | Springs and Cress Beds |
|------------------------------------|-------------------|---------------------|------------------|---------------------------------|
| <u>Vertebrates</u> | | | | |
| Water Vole | / | | | |
| Fadpoles and Frogs | / | | / | / |
| Smooth Newt | / | | | |
| Stickleback: 3-Spined | | / | | |
| 10 8-Spined | / | | | |
| <u>Invertebrates</u> | | | | |
| HYDRA: <u>Hydra viridis</u> | / | | | |
| FLATWORMS: <u>Dugesia lugubris</u> | / | | | |
| <u>Polycelis felina</u> | | | / | / |
| <u>Polycelis nigra</u> | | | / | |
| <u>Crenobia alpina</u> | | | | / |
| OLIGOCHAETAE: <u>Tubifex</u> | / | / | / | / |
| <u>Nais</u> | / | | | / |
| <u>Lumbriculidae</u> | / | | | / |
| <u>Lumbricidae</u> | | | | / |
| LEECHES: <u>Glossiphonia sp.</u> | | | / | |
| <u>Erpobdella</u> | | | | |
| <u>octoculata</u> | | / | / | |
| CRUSTACEANS: <u>Copepoda</u> | / | / | | / |
| <u>Ostracoda</u> | / | / | | / |
| <u>Gammarus pulex</u> | / | / | / | / |
| <u>Asellus aquaticus</u> | / | / | | / |

Where found

| | | Northern Fonds | Northern ditches | River Purwell | Springs and Cress Peds |
|----------------------|---|-------------------|---------------------|------------------|---------------------------------|
| CADDIS LARVAE: | <u>Limnephilus sp.</u> | ✓ | ✓ | ✓ | ✓ |
| | <u>Phryganea grandis</u> | | ✓ | | |
| | <u>Stenophylax</u> | | | ✓ | |
| BEETLE LARVAE: | <u>Dytiscid sp.</u> | ✓ | | | |
| | (<u>Dytiscus</u> <u>marginalis?</u>) | | | | |
| SPIDERS: | <u>Argyroneta</u> <u>aquatica</u> | ✓ | | | |
| MITEs: | <u>Hygrobatidae</u> | ✓ | | | ✓ |
| | <u>Limnocharidae</u> | ✓ | | ✓ | |
| SNAILS: | <u>Limnea pereger</u> | ✓ | ✓ | | |
| | <u>Limnea trunculata</u> | ✓ | | ✓ | |
| | <u>Potamopyrgus</u> <u>jenkinsi</u> | | ✓ | | |
| | <u>Valvata</u> | | | ✓ | |
| | <u>Planorbis sp.</u> | ✓ | ✓ | | |
| BIVALVE MOLLUSCS: | <u>Sphaeliidae</u> | | ✓ | | |
| | <u>Fisidium</u> <u>amnicum</u> | | ✓ | | |

ing function and the revived Greek Doric order.

John Robson's design has proved as sound as it is beautiful. More than a century and a half after its construction, it continues to withstand loads vastly in excess of those it was intended to bear. There is a limit nonetheless to the amount of traffic it should be expected to carry, and proposals just announced for a Wadesmill bypass, perhaps to begin in 1989, are much to be welcomed. Restoration of the bridge should include replacement of railings of the original pattern. Hertfordshire is not rich in good bridges and of these Wadesmill is by far the most remarkable.

Acknowledgements

For information about Pynes Bridge I am indebted to Mr D.L.B. Thomas of Exeter. I am also grateful to the staff of the Highways Department at Goldings and the County Record Office at County Hall, Hertford, for the help they have given me.

Purwell and Ninesprings

WYMONDLEY

by Noel Farris

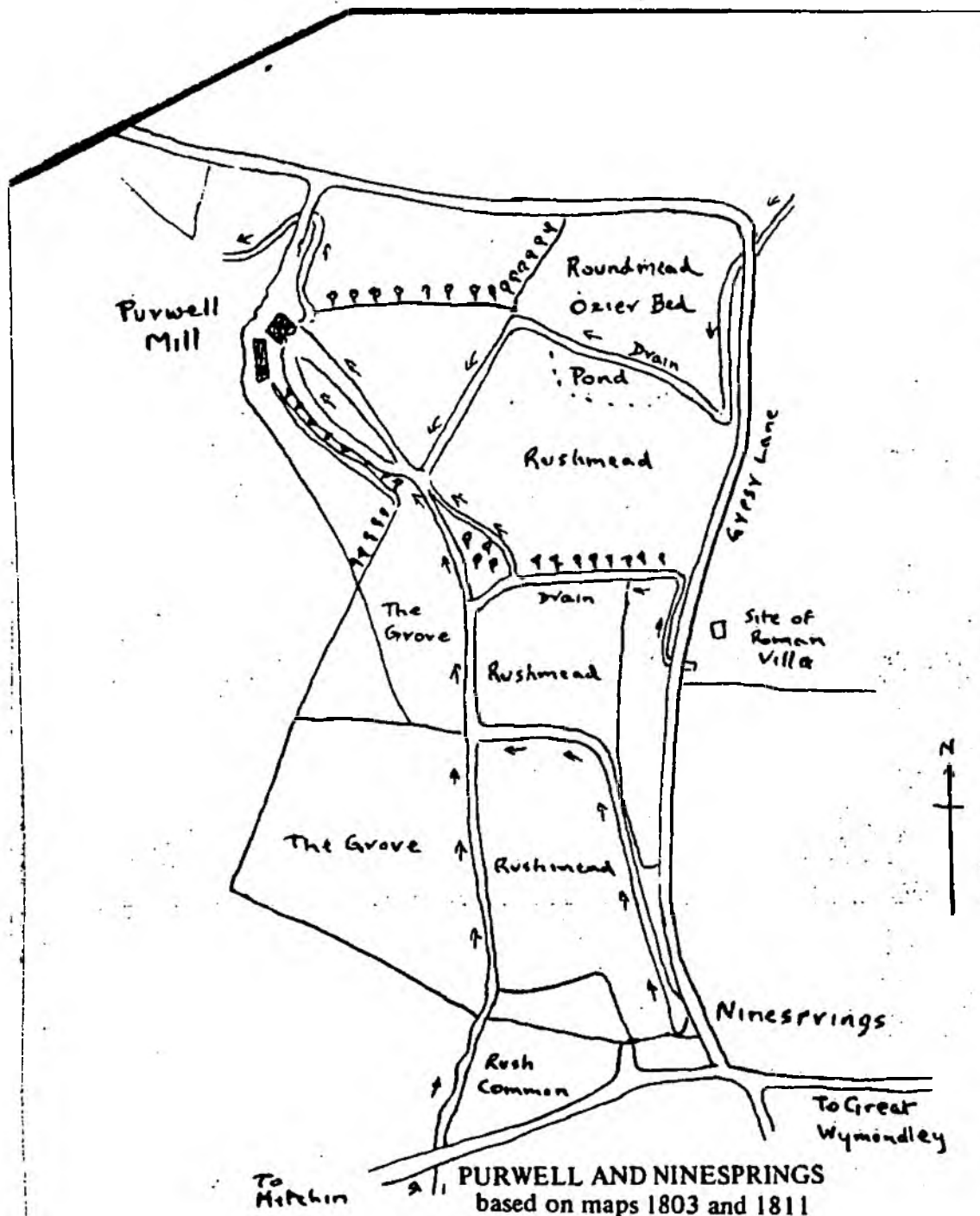
The Purwell River receives its water from three main sources: the Ash brook, the Ippolyts brook and the springs which may be said to be its true origin. The confluence of the two brooks occurs at a short distance to the south of the area shown on the map, and the resulting stream joins the spring water from Ninesprings within the area. Purwell watermill stands at a point on the north-west boundary and the water supply which provided the power to drive the mill wheel came from the combined streams.

The west side of the area forms the boundary of the manor of Wymondley, while the east side is bounded by a road, now mostly a muddy lane, which was probably a Roman road. This road which runs almost due north for most of its route, is known as the Grimstone Highway at its south end near Little Wymondley village. Where it passes the Purwell area it is now called Gypsy Lane, and it runs within a few yards of the site of the Roman villa which was excavated in 1884. When Gypsy Lane swings to the left, the old road continues northwards, and outside the Purwell area its probably route can be traced in parts along old parish boundaries, as far as the site of the Roman camp and the Icknield Way at Wilbury Hill.

The Purwell area shown in the attached sketch forms an approximate rectangle, and because much of it is below the level of the surrounding land, there are ponds and marshy areas, parts of the latter being wooded. It was this aspect which enabled it to play a special part in the economy of Wymondley Manor.

The origin of the name 'Purwell' has been the subject of much discussion. Some say that 'pur' represents a pear tree and 'well' relating to springs, gives us springs which rise by a pear tree – an unusual tree in the wild. Others think that the whole word comes from the English dialect word 'prill', meaning a small stream of running water. In the medieval manor records it is spelt in several different ways, probably most frequently as 'Pyrewelle', but one spelling found in the early fourteenth century is 'Purewelle' which to modern ears describes the crystal clear water of the springs.

The lord of the manor of Wymondley paid an annual rent of 6d to the lord of



PURWELL AND NINESPRINGS
based on maps 1803 and 1811

Scale 13.3 inches to 1 mile
Arrows show water flows

Hitchin for a part of the Purwell mill house.¹ This apparently happened because although the watermill itself was in Wymondley and had been since Domesday and earlier, the boundary of the manor at this point was the river bank and a part of the mill house extended over the boundary into Hitchin manor. The mill itself was an important part of the Wymondley manor economy and most of the tenants of the manor owed suit of mill – the obligation to have their corn ground at one of the lord's mills. Traders in corn and flour must have used Purwell mill extensively but were not always allowed free access to it. The manor account roll² of 1367 records "20d from three cornmongers for having a way through the lord's willows at Purwell". Five years later the charge was increased – "12d from Adam Knotte, cornmonger, for having a road through the lord's land at Purwell" and subsequently "for having a road through the marsh there".

Willow trees would have grown well on the damp conditions of the site and they often provided timber for the mill although the precise purpose for which the wood was used is not stated. In 1353 William the miller paid 4s 6d for willow tops and sometimes they are called willow heads. Pasture too was sold by the manor in most years and seems to have fallen into two groups of prices 2s 6d and 3s 6d. In Purwell river meadow and at the 'grassy island' it was sold for 2s 6d, while pasture at 'le Dam' sold for 3s 6d.

The very wet area was obviously suitable for the growth of reeds and rushes and these had several uses: the principal use of reeds was for thatching while rushes in medieval times were used for strewn on floors. The plants were harvested in large quantities but unfortunately the Latin words used in documents do not make it clear which ones are being considered. Where large numbers of sheaves were mentioned they were probably reeds, and in one case this is indicated. In 1367 stretches of rushes and sedges were sold for 6d. In 1363 six and a half hundred sheaves, probably reeds, were gathered at the cost of 8d per hundred and in 1361 the stock in hand was 2,900 sheaves. In 1373, 1200 sheaves were used to cover the roofs of the chapel and hall and other rooms at the manor house.

The Purwell area of some 35 acres now contains three or four acres of woodland. The field formerly known as the ozier bed, in the north-east corner, three and a half acres in extent, has had its surface raised and levelled in recent years. A part of Rushmead has been marred by haphazard tipping and is now known as 'The Dump'. The whole of Rushmead is an area of fourteen acres, and Rush Common – over two acres – was open common land until the Enclosure in 1811. These field names give a good indication of the character of the land. In 1980 almost nineteen acres of the area were leased to the Hertfordshire and Middlesex Trust for Nature Conservation as a nature reserve and some excellent conservation work is now being done on this site. Watercress beds formerly covered part of the south of Rushmead and the area of the springs. The beds have now been entirely removed and the shallow water area and adjacent land is intended to be developed commercially as a small leisure centre. The springs, from which Ninesprings takes its name, still rise freely at the extreme south-east corner of the site, within "the lord's little park at Purwell" of six centuries ago, and some reeds and rushes still grow in and around Purwell pond.

The streams and ponds attracted waterfowl and provided a supply of fish for their food. There is written evidence of a heronry there in the early fourteenth century and no doubt this was a successor to earlier ones. The quiet stretches of shallow water favoured the habits of herons and the tall trees provided suitable nesting places.

The Wymondley manor account rolls³ for 1352 record considerable sales of

Young herons:-

2s for two heron chicks sold to Thomas Isgat

3s 6d for three heron pullets sold at London

28s 6d for nineteen heron chicks sold at London for 18d each

38s for twenty five heron chicks sold at London for 18d each plus 12d in all.

It would seem that the heronry was being run on a commercial basis, and there is evidence some twenty years later that the trade was continuing. The account rolls⁴ of 1373 show that even more birds were disposed of although as we have here only figures in the stock account, these do not show the value credited to the baliff:-

Produce of the heronry this year, fifty three herons after deducting eleven for labour and seeking them in the woods (perhaps this indicates that some birds escaped).

Of these, four were sent to Lord Kendale at the Hall of Hitchin

four to Margaret Blomvyle, lady of Graveley

four to John Thetre, on the lord's order

four to the lord of Ellesfield

Fortyone to the steward of the lord's hospice in London.

The number of young birds produced would indicate twenty or more nests and the clusters of large nests in tall trees must have been an impressive sight as well as being a challenge for those 'seeking them in the woods'.

The pursuit of these birds by trained hawks or falcons was a form of medieval sport which continued up to the end of the sixteenth century when sporting guns were developed. The larger the bird the greater the attraction it had for the sportsman so that herons were especially sought after. The sportsman with a hooded falcon on his wrist, would be on horseback in open country but on foot when in woods or by streams or lakes. The falconer frightened the birds and made them rise and the hunter released his bird of prey and endeavoured to follow it until it brought down its quarry. When following the hawk on foot it was usual for the hunter to have a stout pole⁵ to help him to leap over little rivulets or ditches which might otherwise hinder his progress. It is this aspect of hawking which is concerned in a well known event recounted by contemporary chroniclers, which could have happened at Purwell. It occurred in 1525 and concerned Henry VIII when he was thirty-five years old and was becoming stout. In the words of Edward Hall "the Kynge followyng of his Hawke, lept over a dicke beside Hychyn with a polle, and the polle brake, so that if one Edmond Mody, a foteman, had not lept into the water and lift up his hed which was fast in the clay, he had bene drowned; but God of his goodnes preserved him."

Edmond Mody or Moody was rewarded with a pension of a groat a day or about £6 per annum, a very fair sum when we compare it with the £5 pension which the King granted to the former prior of Wymondley a few years later. Payment of Moody's pension was honoured as we see in the following example.⁶ "The 24th day of September 1531, paid to Edmond the foteman, being in pension of a grote a day for one quarter now ended, xxx shillings."

Hall's statement that the event took place 'beside Hitchin' is repeated almost word for word by another chronicler, Richard Grafton, but he had a reputation for cribbing other writers' material. But John Stowe in his account of the event, says that it happened at Temple Dinsley, a few miles to the south. However, the late Mr Hubert Hailey of Delamere, Great Wymondley, told the writer that the herons which offered the greatest sport in the district were said to have been bred at Purwell by members of the Moody family whose descendants still live in Hitchin. So may we not enter the competition with other areas and claim that the royal narrow escape could very likely have happened at Purwell?

Wild life is still plentiful at Purwell and Ninesprings, and many birds frequent the streams and marshy areas although the heron is only a rare visitor. As for the nature reserve, it has to cope with the modern problems resulting from nearby housing estates.

REFERENCES

1. Farris. Wymondley Mills and Millers. *H. Past* 9, p.10.
2. Herts C.R.O. 57532.
3. Herts C.R.O. 57534.
4. Herts C.R.O. 57535.
5. Strutt's *Sports and Pastimes of the People of England*.
6. Privy Purse Expenses of Henry VIII. B.M. 807d 13, p.164.

HERTFORDSHIRE LOCAL HISTORY COUNCIL: SURVEY OF RESEARCH AND WRITING IN LOCAL HISTORY

A selection of the more recently notified projects is given below. Members of the HLHC, both individual and corporate, and others interested in Hertfordshire history, are urged to help keep this survey up-to-date by providing details of projects in Hertfordshire history newly begun, or recently completed and published.

To register projects, please send the following information: NAME, NAME OF PROJECT, BRIEF OUTLINE OF PROJECT, and its degree of completion (PLANNING STAGE, IN PROGRESS, PROJECTED PUBLICATION) to the Vice-Chairman of the HLHC, Dr Doris Jones-Baker, Lamb Cottage, Whitwell, Hitchin, Hertfordshire.

HISTORICAL PROJECTS: Part IV

For previous lists see *Hertfordshire's Past* 8, (Spring 1980), 10 (Spring 1981), and 13 (Autumn 1982).

Dr Doris Jones-Baker: Medieval Graffiti in Hertfordshire

H.O.N. Farris: The History of Great and Little Wymondley

Gillian Gear: Food Control in the First World War - East Barnet

Church Farm Boys Home - East Barnet

19th Century Education in Hertfordshire

Kenneth Green for the Hertfordshire Family & Population History Society:

Transcription of the Flaundon Parish Registers

Robin Harcourt-Williams: The Salisbury-Balfour Papers (for publication by the Hertfordshire Record Society)

Peter Moyse: John Scott of Aswell

North Herts Villages Research Group: The History of Therfield, Kelshall, Sandon, Rushden, and Wallington

Anthony Palmer, Ed.: *Tudor Churchwardens' Accounts* (published by the Hertfordshire Record Society, autumn 1985)

Stevenage Society: Stevenage Maps

Stevenage in the 1830s

Stevenage at War, 1939-45

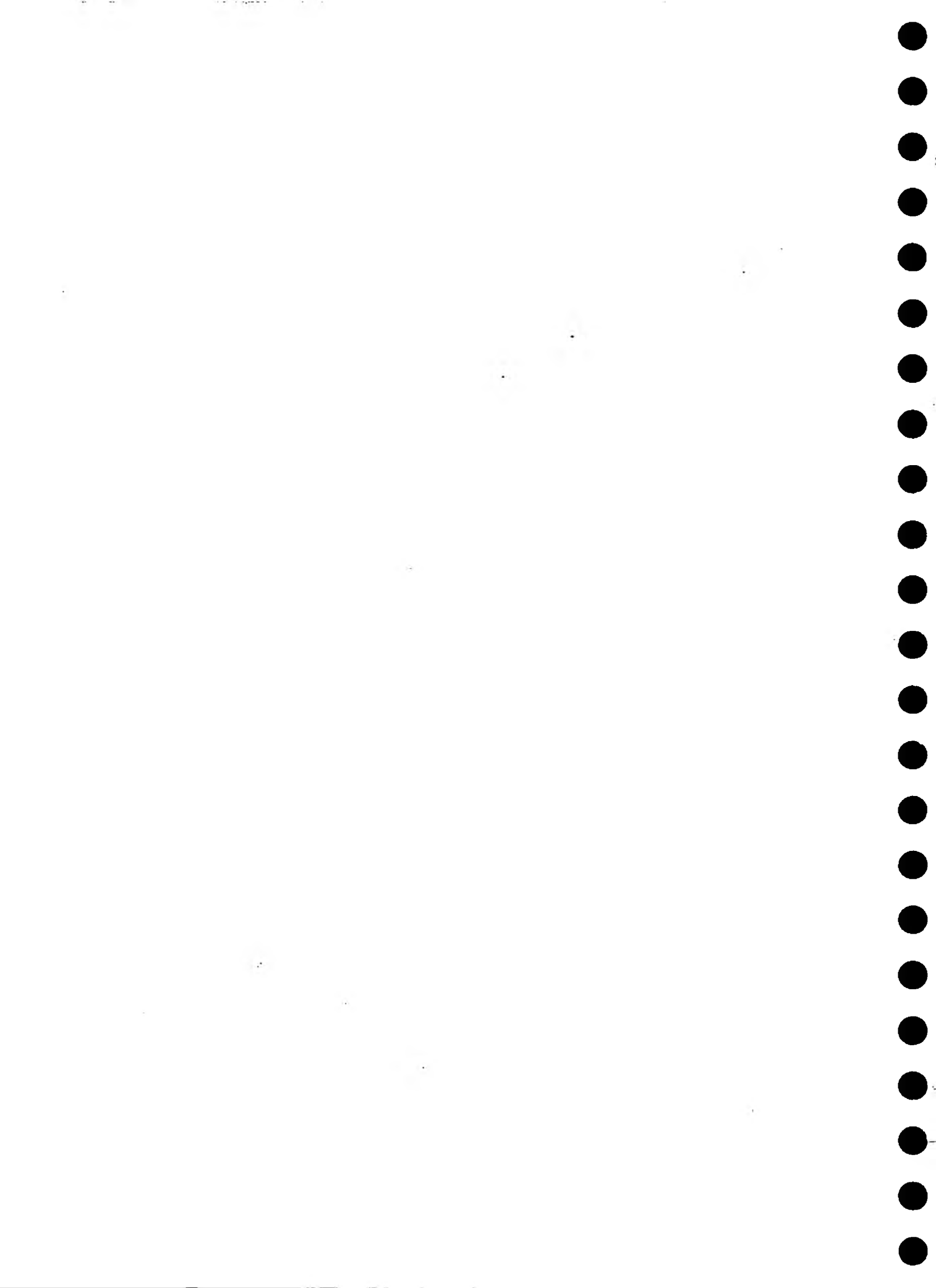
Wells in Stevenage

Alan Thomson: Government and Society in Hertfordshire, c.1625-1675

Joy Tomkins: Methodism in Sleaps Hyde, 1835-1985

Margaret Vincent: The Church and Manor of Puttenham, Hertfordshire

The Rev. Colin Weale: Parochial Patronage in the Diocese of Lincoln in the 13th Century (for M.Phil., Open University)



THE PURWELL VALLEY : from its sources downstream to Grove MillA. Ippollitts Brook 198260

1. Rises at GR. 260490 just north of Little Almshoe Farm, Little Almshoe, and flows north.
After heavy winter and spring rains, and a higher watertable, it may rise as 'a winterbourne', or an occasional winter stream 2/3rds of a mile further south, in the meadow north of Almshoebury Farm entrance, near the junction of the B.651 Whitwell Road with the B.656 Codicote road. From here it flows north in a very narrow ditch-like channel, near to the main road, past Chapelfoot and the public house, to its more normal source at Little Almshoe.
2. For its first 700 metres, its appearance is as a field drainage channel.
3. St. Ibbs Park : south of Sperberry Hill lane, there are several riverside ponds with willow and alder. North of the lane, we come to the 'lake amidst the park' scene, landscaped in Georgian times, c.1805, by Rev. William Lax, squire of St. Ippollitts. The small stone bridge at the northern end of the widened river channel or 'lake' is a copy of that at Trinity College, Cambridge; a footpath through the park and over the bridge.
Note steepness of eastern valley side, on Sperberry Hill lane, and on lane in village from B.656 to the church.
4. Brookend Farm, St. Ippollitts - 1000 m. to Stevenage Road A.602 bridge : no access. River continues through patches of alder swamp with springs.
5. Stevenage Road bridge - c.1000 m. along southern edge of Ninesprings Estate - under railway bridge to Wymondley Road : Footpath. Housing estate built 1960's/1970's : has increased volume of runoff from roads, pavements and house roofs into the brook. The present estate was built over arable fields which previously belonged to Bancroft Farm in Bancroft, Hitchin.

B. Ashbrook

1. Rises (by seepage from gravel pit?) west of Little Wymondley. Flows north passed the Ashbrook Lane Sewage Works with its settling beds and filter tanks. Source of sewage? The brook flows under the Stevenage A.602 road, near Ashbrook Cottages northwards across arable fields to join the Ippollitts Brook. Its appearance is as a field drainage channel.

C. The Purwell

Formed by the confluence of the Ippollitts and Ashbrook streams, and the water which rises from the Ninesprings. Joined during its length by drainage water from the eastern valley side in 2 long drains, and also by runoff from the urban areas of the Wymondley Road Estate and Purwell/Walsworth.

a. The Purwell Ninesprings Nature Reserve.

Since May 1980, leased to the Herts. and Middlesex Trust for Nature Conservation for 50 years; size : 18.8 acres.

The complex local hydrology or watertable pattern makes this area a spring-line fen with alkaline water, i.e. a 'wet' area near to where springs issue from the chalk bedrock below.

Habitat types : pond and reed beds, sedge bed, wet meadow, alder carr, alder and ash wood, hedgerows and scrub, a raised derelict area, and the former watercress beds now a smallholding with varied livestock.

Reserve management : Warden : Mr. Martin Ketcher, 328 Norton Way South, Letchworth (Letchworth 78658). His permission must be obtained before visiting the Reserve.

See enclosed details.

b. Purwell Mill and adjacent grazed meadows, upstream and downstream.

Earlier forms of name of Purwell:- Pirriwell, Pirral, Pearl and Pirre (Hine II, p.359).

At Domesday (1086), Purwell Mill was in the manor of Great Wymondley, and the D.B. lists King William as holding one mill there.

1670 Purwell was a private mill.

The 1766 Drury & Andrews map of Hertfordshire shows and names seven water mills in the Ickleford - Walsworth - Hitchin - Charlton area, and includes 'Perrets Mill' just north of Purwell Head.

The mill continued in use throughout the 19thC., except for a short period between 1855 and 1861; in 1855 the old wooden mill burnt down and a new brick one was built by 1861. Sometime before 1921 a steam engine was installed to drive the mill in times of drought, but by 1924 operation of the mill was no longer viable and so milling ceased. The mill today is a private residence, and two of the former millstones form part of the fountain in the library's courtyard in Paynes Park, Hitchin.

Ref. See also 'Old Hitchin' : Poole and Fleck, page 71 : text and photograph of Purwell Mill and the house.

c. Purwell Meadows Reserve.

Owned by North Herts. District Council since March 1983 with the help of grants from the Countryside Commission, the Nature Conservancy Council and the World Wild Life Fund. Now has the status of an SSSI. Size : c. 21 acres.

Hydrology : chalk river, springs, millstream.

Habitat types : pastures, marsh, thorn scrub, former watercress beds.

Of value and interest because this area is the last remaining example of the alluvial grazing meadows which have been such a feature of the Hitchin area in the last 1000 years (?), in the valleys of the Hiz, Purwell and Oughton; other meadows of this type have either become derelict or have been 'improved' by the use of fertilisers and pesticides : by either 'method', the species of plants and, consequently, of all wildlife has been diminished.

Reserve management : Natural History Department, Museums Service : Brian Sawford or Trevor James. A permit for all groups is required from Andrew Wearmouth, Surveyor, North Herts. District Council. (ext. 320).

d. Walsworth Common : c. 4 furlongs/1/2 mile.

River flows through wet grassland area of the Common, past the Ship, and the Sailor Boy public houses, under the Hitchin-Cambridge railway line, and Grove Road, to join the River Hiz at Grove Mill, a former watermill.

A meandering stream in a recreational zone.

Analysis

a. The river channel : size, shape; volume and details of river flow. Flora and fauna. Man's use of the water.

b. The river valley : floor and valley sides : size and shape. Land use : Reserves for wildlife, agriculture, industrial, residential, recreational.

Bibliography

1. Hitchin & District Regional Survey Association: The Natural History of the Hitchin Region, 1934.

2. Brian Sawford : Wildlife of the Letchworth Area, 1983.

3. Cyril Moore : Hitchin's Mills.

Herts. Countryside, December 1981 and January 1982.

Maps

1. Scale 1:10,000 (6") TL 22 NW, TL 12 NE, TL 13 SE.

2. Scale 1:63,000 (1") 147 Bedford and Luton.

RURAL SURVEYS RESEARCH UNIT
DEPARTMENT OF GEOGRAPHY,
U.C.W., ABERTSYTH.

BIOLOGICAL SURVEY OF COMMON LAND

NATURE
CONSERVANCY
COUNCIL

CL No: [50] County: **HERTFORDSHIRE**.....^{CODE} [27] Grid ref: [5 195 2304] 10 Km sq. [TL 13] O.S. Sheet: [166]
Status: [**F**] Area (ha): [**6**]. [49] Altitude: Max. [**60**] Med. [] Min. [**60**] Vice County: [20]

SITE NAME: WALSORTH COMMON, HITCHIN Date of Visit: [19.07.88]
[C] C = Information Collated

Recorder/ [IF] .. Time on [0h 45m] No. of [4] Access permission
Compiler: Site: photographs: from:

CONSERVATION [] \$ [-] [:] \$ [] [] \$ [:] [] \$ [:] [] \$ [:]

TIES:

(% = % of site)

| | | | | | | |
|----------|--------------------|-------------------|---------------------|-----------|-------------|----------------------------|
| 1 = SSSI | 2 = MCR Site | 3 = NNR | 4 = LNR | 5 = ESA | 6 = SPA | 7 = National Park |
| 8 = AONB | 9 = Heritage Coast | 10 = County Trust | 11 = National Trust | 12 = RSPB | 13 = Remear | 14 = Other (specify below) |

General description of site: A level area of reseeded grassland, predominantly a cricket pitch, but with some woodland areas, scattered trees and riverside habitats.

Owner(s): Hitchin LDC (North Herts. D.C.)

[illegible]

Public access and recreation:

Open access. Part is a cricket pitch, and a children's playground is also present.

WAGEMENT: Total Area: 7.6

SITE CHARACTERISTICS:

| | | | |
|----------|---|---------------|--------------------|
| Hay | | Grazing Time: | Grazing Intensity: |
| Down | ✓ | Spring | None. |
| Cattle | | | |
| Sheep | | Summer | |
| Horses | | | |
| Rabbits | | Autumn | |
| Burning | | | |
| House | | Winter | |
| | | All year | |
| Coppice | | | |
| Planting | ✓ | Irregular | |

Main Geology [] [] Main Soils [] []

Slope [0°] Aspect [0°]

Ridge + [] Flooding []

Scrub [] Mature trees []
invasion (>60 cm DBH)

Much dead wood [] Base-rich wet flushes []

Bare ground: [] Origin

Litter accumulation: [] Type

| | |
|------------------|---|
| Thinning/felling | Managed by: |
| Guarding | Conservators [], Management [] Committee |

| | | | | |
|--|-------|-------------------------------------|------|--------------------------|
| | Other | <input checked="" type="checkbox"/> | None | <input type="checkbox"/> |
|--|-------|-------------------------------------|------|--------------------------|

| | | |
|------------|---|-----------------|
| recreation | ✓ | Local Authority |
|------------|---|-----------------|

| | |
|-----------|------------------------------------|
| Fisheries | Sources of information/references: |
| Sampling | N. Herd Museum Service Files. |
| | Invertebrate Site Register. |
| | Field Visit. |

General notes on site:

No rights. True area apparently larger than registered area.

TL 13 VI

| Grid Ref. | LOCALITY | | HABITAT | | SOUTH EAST | | | | | |
|-----------|----------------------|----------|---------|------|------------|--------|--|--|--|--|
| | V1. Walsworth Common | | | | | | | | | |
| | | | | | | | | | | |
| Date | | V.C. No. | | V.C. | | Herts. | | | | |
| 1974 - | | 20 | | | | | | | | |
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|-----------|-------|------|------|-------|-----|------|---------|------|------|---------|------|-------|-------|------|-------|----------|----------|
| 1131 | Leont | ley | 1343 | Narci | psa | 1514 | Polyg | ser | 1697 | Ribes | uva | 1906 | Serra | tin | 2091 | Trifo | pra |
| 1133 | Lepid | cain | 1344 | Nardu | str | 1515 | vul | vul | 1701 | Rorip | amp | 1912 | Shera | arv | 2092 | rep | rep |
| 1137 | rud | | 1345 | Narth | oss | 1521 | Polyg | amp | 1703 | ist | | 1915 | Siegl | deo | 2094 | aca | aca |
| 1139 | ami | | 1346 | Nastu | mic | 1522 | *avi | bis | 1704 | syl | | 1918 | Silau | sil | 2095 | squ | squ |
| 1144 | Ligus | vul | 1348 | *off | | 1523 | bis | con | 1705 | Rosa | agg | 1923 | Silen | cuo | 2097 | striatum | striatum |
| 1147 | Linon | del | | | | 1527 | con | hyd | | | | 1932 | Sinap | alb | 2101 | Trigl | mar |
| 1148 | bin | | 1349 | o x m | | 1530 | hyd | lap | 1708 | *can | | 1934 | Slaon | amo | 2102 | pal | pal |
| 1149 | hum | | 1352 | Neott | nid | 1531 | lap | mit | 1714 | *rub | | 1935 | Slaym | ait | 2105 | Trisa | fla |
| 1154 | vul | | 1353 | Nepet | cat | 1535 | mit | nod | 1719 | spi | | 1938 | off | | 2110 | Typha | ang |
| 1181 | Linar | rep | 1356 | Nupba | lut | 1538 | nod | per | 1720 | sty | | 1939 | ori | | 2111 | lat | lat |
| 1184 | | | 1358 | Nymph | alb | 1537 | per | vul | 1722 | *vul | | 1944 | Slum | lat | | | |
| 1189 | Linum | cat | 1360 | Nymph | pel | 1544 | Polyp | vul | 1726 | Rubus | caa | 1945 | Smyrn | oku | 2112 | Ulex | eur |
| 1173 | Liste | ova | | | | 1546 | Polys | lob | 1729 | ida | | 1949 | nig | | 2114 | min | min |
| 278 | Litbo | arv | 1381 | Odont | ver | 1548 | Popul | alb | 1735 | Rumex | | 1951 | Solid | vir | 2119 | Ulmus | glia |
| 1174 | off | | 1382 | Oenan | aqu | 1549 | can | nig | 1736 | ace | | 1952 | Sonch | arv | 2120 | Urtic | off |
| 1182 | Loliu | mul | 1383 | cro | | 1551 | can | ser | 1734 | acetosa | | 1953 | asp | | 2132 | Utric | *vul |
| 1183 | | | 1384 | fla | | 1554 | nig | tre | | | | 1957 | Sorbu | *ari | 2136 | Vacc | myr |
| 1188 | Lonic | per | 1385 | flu | | 1550 | ser | col | 1742 | crispus | | 1960 | ano | | 2139 | Valer | dio |
| 1191 | Lotus | cor | 1388 | lac | | 1555 | tre | cri | 1745 | byd | | 1982 | Sparg | min | 2140 | off | off |
| 1193 | ten | | 1370 | Oenot | bic | 1561 | Potam | den | 1747 | mar | | 1981 | ram | den | 2143 | Valer | den |
| 1194 | ull | | 1375 | Onobr | vic | 1563 | cri | luc | 1748 | obt | | 1983 | ram | den | 2145 | loc | loc |
| 1201 | Luzul | cam | 1377 | Ononl | rep | 1564 | den | nat | 1749 | pal | | 1988 | Spart | byb | 2146 | nig | nig |
| 1202 | for | | 1378 | spi | | 1569 | luc | pec | 1751 | pul | | 1991 | Sparg | marg | 2150 | Verba | off |
| 1204 | mul | | 1379 | Onopo | aca | 1570 | nat | per | 1753 | san | | 1992 | Sparg | rob | 2157 | thapsus | off |
| 1207 | pil | | 1381 | Upluo | vul | 1574 | pec | pra | 1756 | ten | | 1992 | Sparg | rob | 2159 | Verbe | off |
| 1209 | syl | | 1382 | Uphry | api | 1575 | per | ang | 1761 | Ruscu | acu | 1990 | ape | sal | 2161 | Veron | agr |
| 1210 | Lychb | ilo | 610 | Urchu | eri | 1576 | pol | arg | 1762 | Bagin | ape | 1997 | Spira | spi | 2163 | ana | ana |
| 1211 | Lyciu | chi | 608 | fuc | | 1577 | pra | ere | 1763 | mar | 2001 | Stach | off | 2165 | arv | arv | |
| 1212 | hal | | 1387 | mas | | 1583 | Poten | pal | 1768 | nod | 237 | off | 2166 | bec | bec | | |
| 1218 | Lycop | arv | 1389 | mor | | 1584 | ans | kte | 1769 | pro | 2003 | pal | 2167 | cat | cat | | |
| 1219 | Lysim | nem | 1393 | Origa | vul | 1585 | arg | tab | 1771 | Sagit | sag | 2007 | Stell | ala | 2168 | cha | cha |
| 1222 | Lysim | nem | 1396 | Ornit | umb | 1588 | ere | san | 2242 | Salic | agg | 2008 | ape | ape | 2171 | bed | bed |
| 1222 | num | | 1397 | Ornit | per | 1592 | pal | ela | 1784 | Salix | alb | 2009 | gra | hol | 2172 | mon | mon |
| 1225 | vul | | 1401 | Oroba | ela | | | ver | 1787 | aur | 2010 | 2011 | *med | 2173 | off | off | |
| 1227 | Lythr | sal | 1404 | min | | 1596 | kte | vul | 1789 | *cin | 2011 | 2012 | 2013 | 2175 | per | per | |
| 1228 | Mahon | aqu | 1413 | Oxali | ace | 1597 | tab | vul | 1790 | pur | 2013 | neg | 2176 | pol | pol | | |
| 1230 | Matus | syl | 1424 | Papav | arg | 1598 | Poter | avi | 1794 | rep | 2015 | pal | 2179 | ser | ser | | |
| 1232 | Malva | tuos | 1428 | dub | | 1599 | san | dom | 1802 | tri | 2018 | Sused | fru | 2180 | Vibur | lan | |
| 1233 | neg | | 1427 | byb | | 1600 | Primu | pal | 1804 | vim | 2019 | mar | 2184 | opu | opu | | |
| 1233 | neg | | 1430 | rbo | | 1605 | ver | spi | 1805 | vim | 2019 | mar | 2185 | ang | ang | | |
| 1238 | Marru | vul | 1436 | Paris | qua | 1607 | vul | | 1806 | Salso | kal | 2021 | Succi | pra | 2186 | Vicia | gra |
| 1239 | Matri | cha | 1437 | Farna | pal | 1611 | Prunu | | | | | | | | 2189 | gra | gra |
| 1241 | mar | | 1440 | Pasti | sal | 1614 | dom | | | | | | | | | | |
| 1247 | Medic | ara | 1441 | Pedic | pal | 1616 | pad | | | | | | | | | | |
| 1442 | syl | | 1442 | syl | | 1617 | spi | | | | | | | | | | |
| FOLD HERE | | | | | | | | | | | | | | | | | |
| 1248 | fal | | 1443 | Penta | sem | 1619 | Pteri | aqu | 1809 | Salvi | bor | 2024 | Symph | off | 2191 | hir | hir |
| 1249 | bis | | 1444 | Pepli | por | 1620 | Pucci | dis | 1814 | Sambu | ebu | 2032 | Tamus | com | 2194 | lat | lat |
| 1250 | lup | | 1446 | Petas | fra | 1622 | mar | | | | | 2033 | Tanac | vul | 2197 | set | set |
| 1252 | sat | | 1447 | hyb | | 1625 | Pulic | dys | 1817 | Samol | val | 2034 | Tarax | *agg | 2198 | sep | sep |
| 1253 | var | | 1450 | Petro | seg | | | | 1819 | Sangu | oil | 2039 | Taxus | bac | 2201 | tenus | tenus |
| 1258 | Melan | pra | 1453 | Puce | pal | 1638 | Querc | pet | 1821 | Sanic | eur | 2041 | Teest | nud | 2202 | Vioca | maj |
| 1258 | Melan | alb | 1454 | Phala | aru | 1640 | rch | | 1822 | Sarot | sco | 2048 | Teur | | 2205 | min | min |
| 1261 | noc | | 1459 | Phleu | are | | | | 1830 | Saxif | gra | 2048 | Teur | | 2206 | Viola | arv |
| 1259 | rub | | 1461 | nod | | 1641 | Radio | lin | 1843 | tri | | | | | 2207 | can | can |
| 1263 | Melic | uni | 2247 | *pra | | 1642 | Ranun | acr | 1843 | Scabi | on | 2048 | Thali | ita | 2210 | hir | hir |
| 1264 | Melil | alb | 1463 | pra | | 1643 | arv | | 1847 | Scand | pec | 2049 | Thely | pal | 2214 | odo | odo |
| 1265 | alt | | 1465 | Phyll | sco | 1644 | aur | | 1851 | Schoe | lac | 2052 | Thias | arv | 2215 | pal | pal |
| 1267 | oil | | 1466 | Phyll | sco | 1645 | aur | | 1852 | Schoe | tab | 2053 | Thymu | dru | 2217 | rei | rei |
| 1272 | Menth | aqu | 1472 | bic | | 1648 | cir | | 1853 | Schoe | nig | 2058 | Thymu | dru | 2218 | rtv | rtv |
| 1273 | arv | | 1475 | Pimpi | maj | 1649 | fic | | 1860 | Scirp | mar | 2060 | Thymu | dru | 2220 | tri | tri |
| 1289 | Menya | tri | 1478 | sax | | 1651 | flamula | | 1861 | syl | | 2061 | Tilla | cor | 2223 | Viscu | alb |
| 1290 | Mercu | ann | 1481 | Pingu | vul | 1652 | flu | | 1862 | Scler | ann | 2063 | Tilla | cor | 2225 | Valpi | amb |
| 1291 | per | | 1484 | Pinus | syl | 1653 | bed | | 1863 | Scrop | aqu | 2064 | pla | | 2228 | bro | bro |
| 1296 | Millu | ed | 1485 | Plant | cor | 1654 | len | | 1867 | Scute | gal | 2065 | Tilla | nus | 2227 | mem | mem |
| 1303 | Minua | ten | 1487 | lan | | 1659 | par | | 1872 | Sedum | acr | 2068 | Tord | arv | 2228 | myu | myu |
| 1305 | Necbr | tri | | | | | | | 1875 | Sedum | acr | | | | | | |
| 1307 | Molin | cae | 1489 | mar | | 1662 | sar | | 1877 | ang | | | | | | | |
| 1312 | Monti | *fon | 1490 | med | | 1663 | ace | | 1881 | ref | | 2070 | nod | | 2237 | Zannl | pal |
| 1315 | Mycel | mur | 1492 | Plata | bif | 1664 | tri | | 1885 | tel | | 2074 | Trago | pra | 2263 | Zerna | ere |
| 1317 | Myoso | arv | 1493 | chl | | 1667 | Rapha | rap | 1891 | Senec | aqu | 1858 | Trich | cae | | | |
| 1319 | cae | | 1495 | Poa | ann | 1673 | Rhamu | cat | 1896 | eru | int | 2077 | Trifo | arv | | | |
| 1321 | dis | | 1504 | com | | 1675 | Rhamu | cat | 1898 | int | | 2080 | cam | dub | | | |
| 1320 | bis | | 1506 | pra | | 1678 | Rhina | *mun | 1899 | jac | | 2081 | dub | | | | |
| 1328 | Myrc | gal | 1507 | tri | | 1681 | Rhync | alb | 1902 | syl | | 2083 | fra | | | | |
| 1332 | ver | | 1512 | Polys | cal | 1684 | Ribes | nig | 1903 | syl | | 2087 | med | | | | |
| | | | 1513 | oxy | | 1686 | syl | | 1904 | via | | 2088 | mic | | | | |
| | | | | | | | | | | | | 2090 | och | | | | |

Other Species

Bilderdykia convolvulus; *Trifolium hybridum;*
Acer platanoides;
Juglans regia;



Geology of Almschelling Swallowhole: (for T.I 25.11.88)

- During the ice age, approx 300 - 200,000 years ago, the ice extended with the edge of the Chilterns. During these glacial conditions, associated streams and meltwater from the ice carved an extensive and extreme gap in the bottom, washing all the chalk away. ~~Hitchin~~ This is known as the Hitchin Gap - Hitchin itself is on 300-400 ft. of glacial deposits directly underlying the Gault clay - all the chalk having been washed away.
- In its place were deposited a series of sands and gravels, with some clay lenses. The feature is known as a buried tunnel valley.

Today, the natural topography of the Region means that the headwaters of the streams rise in the Knebworth Woods area and flow - predominantly north, frequently drying up or disappearing into / over the gravel. They eventually reappear & rise as headwaters of the River Purwell etc. at Purwell Minorspring.

Almschelling is one of three areas where, in times of heavy flow, stream appear going north ^{and} disappear down swallowholes. At times of very high groundwater levels, a shallow lake forms. This happens with long, irregular intervals, but occurs approx every 10 years.

Communities on the valley bottom: *Urtica dioica* LD, *Rubus fruticosus* LD, *Lamium purpureum* O-F, *Rorippa sylvestris* LF (in areas of ruderal vegetation to the north and south), *Plantago major* O, *Solanum nigrum* O, *Chenopodium album* O, *Chenopodium polycarpum* O-LF, *Glechoma hederacea* O-F, *Capsella bursa-pastoris* O, *Desmodium* O, *Geranium molle* O, *Ranunculus repens* O-F-LA, *Gnaphalium uliginosum* R-LF, *Carex hirta* R, *Elymus repens* O-LF, *Holcus lanatus* A (towards south).

"Sink" Communities: *Rorippa sylvestris* A, *Veronica catenata* F, *Veronica hederifolia* O, *Mentha x verticillata* O, *Polygonum persicaria* O, *Sonchus asper* R, *Senecio vulgaris* R, *Epilobium tetragonum* R, *Juncus effusus* O-LF, *Plantago alisma-aquatica* O, *Apium nodiflorum* O, *Glyceria plicata* LF, *Lycopodium europaeus* O, *Polygonum hydropiper* O.

SITE SUMMARY.

Almshoe Bury Meadow is fundamentally a long valley with developing scrub and trees, adjoining a wooded stream section. It has a significant geomorphological interest in that it has a seasonally wet stream which disappears underground, producing a shallow lake in times of high ground water levels. The general groundwater flow is to the south and when low the water disappears leaving the dry valley.

Topographically there is a long, flat valley bottom, with slopes either side which flatten out on top in several places. The grassland is generally neutral, and perhaps most species rich on the slopes. The valley floor is generally enriched from natural leaching of nutrients from the slopes, and also the seasonal influx of water, while the tops of the slopes are likely to be enriched by drift from the adjoining fields. The developing scrub fence-boundaries may produce the factor. Currently the site is grazed, which has at least retained the open character of the grassland habitat. Recent grazing possibly reduced the quality of the field.

ALMSHOE BURY MEADOW

DESCRIPTION TO ACCOMPANY HABITAT MAP.

FIELD SURVEY 18.8.88

M.J.HICKS H.C.C.

BROADLEAVED SEMI-NATURAL WOODLAND

Best developed at the south-eastern end of the site, around the area of the former ponds and stream. (AREA 1). *Quercus robur* and *Fraxinus excelsior* are dominant as mature trees, with *Carpinus betula*.

Shrub layer *Sambucus nigra* O-F, *Corylus avellana* F, *Prunus spinosa*, giving impenetrable barrier.

A small open area is dominated by *Urtica dioica*, with *Endymion non-scriptus* R-O, *Festuca gigantea* R, *Alex aquilinum* R, *Millium effusum* R, *Stachys sylvatica* R,

When surveyed, stream was dry.

At the north-western end of the site a group of mature trees - mainly *Carpinus betula* and *Quercus robur* - have formed a closed canopy over a small area on the top of the eastern slope. Other scattered trees include *Fagus sylvatica*, *Fraxinus excelsior*, *Acer campestre*. Woodland ground flora includes *Arum maculatum*, *Urtica dioica* O, *Urtica dioica* LF, *Arctium minus* O, *Bryonia dioica* R.

Scrub associated with the wooded areas is mostly dense and dominated by *Urtica dioica*; other species include *Acer campestre*, *Sambucus nigra*, which increases further south, and *Corylus avellana*. Associated herbs are

Glechoma hederacea O, *Urtica dioica* LF

NEUTRAL (SEMI-IMPROVED) GRASSLAND.

Communities at the top of the valley slopes: *Dactylis glomerata* O, *Lolium perenne* A, *Urtica dioica* LA, *Rumex obtusifolius* LF, *Lamium album* O, *Aeraleum sphondylium* O, *Holcus lanatus* O-A, *Arrhenatherum elatius* LF, *Carduus arvensis* R, *Ranunculus repens* O, *Achillea millefolium* O, *Agrostis* p R, *Phleum pratense* O, *Stellaria media* R. *Cirsium arvense* O,

Communities on the valley slopes: *Arrhenatherum elatius* O, *Holcus lanatus* F-A, *Rumex acetosa* O-F, *Plantago lanceolata* O, *Agrostis tenuis* O-F-LA, *Crepis capillaris* O, *Trisetum flavescens* O-LA, *Phleum bertolonii* O, *Achillea millefolium* O, *Stellaria graminea* LF, *Dactylis glomerata* O, *Trifolium pratense* O, *Cirsium arvense* O, *Chaerophyllum temulentum* O-F, *Senecio jacobaea* O, *Cirsium vulgare* O, *Rumex crispus* R, *Lotus corniculatus* LO-F, *Convolvulus arvensis* LF, *Trifolium repens* O-LF, *Cynosurus cristatus* LF, *Festuca rubra* O-LF, *Ranunculus repens* O, *Prunella vulgaris* O, *Geranium dissectum* R, *Potentilla reptans* O, *Medicago lupulina* LF, *Urtica dioica* O, *Veronica arvensis* O, *Galium mollugo* O, *Cerastium fontanum* O, *Phleum pratense* O, *Conium maculatum* O, *Dipsacus fullonum* O (by stream) *Anthoxanthum odoratum* O (by stream) *Lathyrus pratensis* O, *Veronica chamaedrys* O. Scattered *Ulex europaeus* occurs at the south-eastern end.

5600
29.563ha
73.05

0006
032ha
08

Coney Cottages

7600
113ha
28

4291
231ha
57

4000
2.111ha
5.22

3485
1510ha
10

4779
174ha
43

4778
170ha
42

4268
5.080ha
12.55

5464
065ha
16

5758
170ha
42

5754
299ha
74

5654
283ha
70

6546
024ha
06

3246
488ha
3.68

5635
12.553ha
31.02

B.M. 99.26m

100-3m

0.91m R.H.

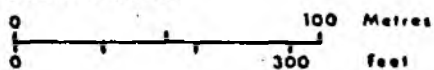
HERTFORDSHIRE COUNTY COUNCIL COUNTRYSIDE HERITAGE SITE

ALMSHOE BURY SWALLOWHOLE

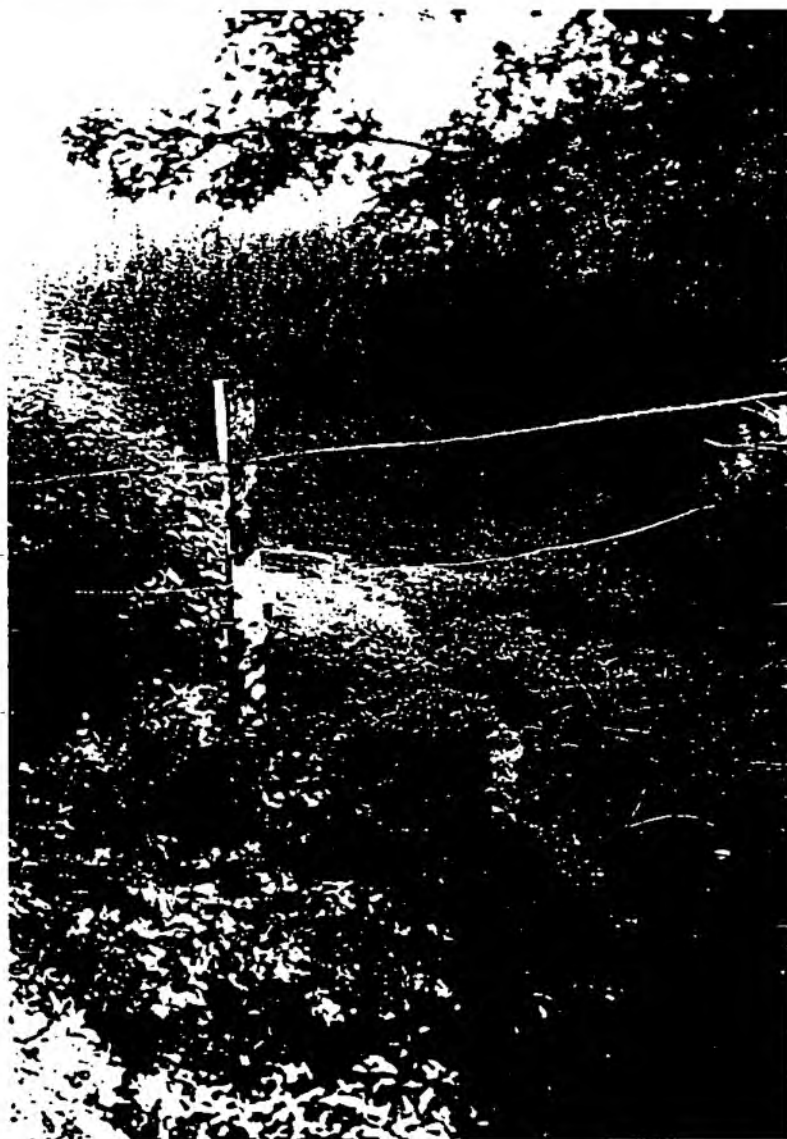
SITE BOUNDARY

Grid Ref TL205 248

Scale 1:2500



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ALMSHOE BURY
SWALLOW HOLE (8/93)

HERTFORDSHIRE COUNTY PLANNING & ESTATES DEPARTMENT

COUNTRYSIDE HERITAGE PROJECT RECORD

SITE NO: 005 NAME: Almshoe Bury Swallowhole

DISTRICT: North Herts

DATE RECORDED: 16/12/88

PARISH: Ippollitts

COUNTRYSIDE MANAGEMENT AREA: Mid-Herts

NGR: TL205248

MAP NO: TL22SW,29/266

AREA: 3.37 ha

REMARKS: Swallowhole formed in small narrow valley in glacial outwash gravels, unique in North Herts. Groundwater reappears further north at Hitchin, and at very high levels the excess forms a deep lake. The topography influences the plant communities; flat valley floor supports grasses and Hairy sedge, the steep sides unimproved neutral grassland with Bent and Fescue grasses, Bird's-foot trefoil and Self heal, while a slightly improved sward exists on the high ground. The streamside flora includes Brooklime, Mints, Gypsywort and Sweet-grasses. Mixed scrub/woodland to the south supports Gt. Tussock sedge.

SITE STATUS: PRO

LAND CLASS ON SITE:

| | | | |
|--------------------------------|------|----------------------------|------|
| WOODLAND semi-nat. broadleaved | 0.57 | Scrub | 0.46 |
| *GRASSLAND neutral | 2.34 | GRASSLAND wet | 0.00 |
| Stream | 0.00 | *Other underground feature | 0.00 |
| Fence | 0.00 | | |

LAND CLASS AROUND SITE: Arable

Track

SITE MANAGEMENT: No full details, but pasture is cattle grazed as part of farm, pulling of Ragwort and topping of weeds, with limited fertilizer app. on high ground.

OWNER: W.G. Titmuss & Sons

OCCUPIER: As owner.

Almshoe Bury

Hitchin

Tel. Hitchin (0462)

Herts

34593

OTHER INTERESTED BODIES:

ADMINISTRATIVE REFS.: Cons. site 29/04

DATE OF COMPILATION: 22/03/89

AUTHOR: M.J. Hicks.

DATE OF AMENDMENTS:

HERTFORDSHIRE COUNTY PLANNING AND ESTATES DEPARTMENT

COUNTRYSIDE HERITAGE PROJECT SITE RECORD

SITE NAME: Almshoe Bury Swallowhole

SITE NUMBER: 005

GRID REFERENCE: TL 205 248

IMPORTANCE OF SITE:

Almshoe Bury Swallowhole lies at the bottom of a small narrow valley situated within gently undulating countryside west of Stevenage. The site demonstrates a unique example in North Hertfordshire of a very specialised hydrological feature, and is also important for supporting areas of unimproved grassland, a habitat now greatly reduced within the County. This combination of interests makes the site particularly valuable for nature conservation.

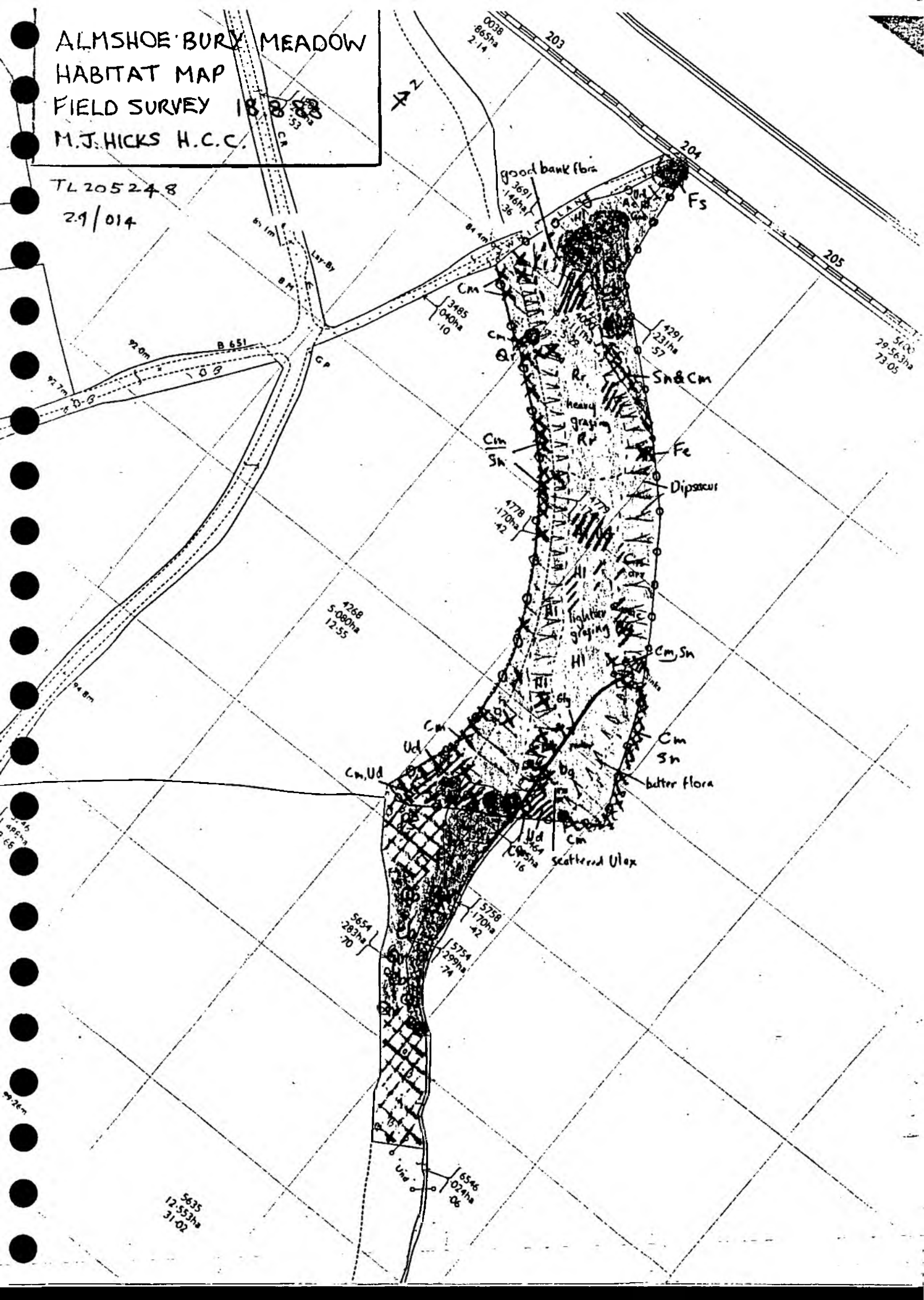
The geological history of the area is complex, but essentially the site is located on glacial outwash gravels which probably overly the chalk in great depth. During moderate groundwater levels a stream enters the site from the south but disappears down a swallowhole on the eastern boundary. The water continues underground to reappear further north where it forms a tributary of the River Purwell at Hitchin. However, at times of very high groundwater levels, there is too much water to drain into the swallowhole and the excess temporarily forms a deep lake.

The peculiar topography of the site caused by thousands of years of this hydrological activity, also influences the plant communities present. The level ground above the valley sides supports rough grassland of Perennial Rye-grass Lolium perenne, Yorkshire Fog Holcus lanatus, False Oat-grass Arrhenatherum elatius, Nettle Urtica dioica, and Broad-leaved Dock Rumex obtusifolius. The steep valley sides have retained unimproved neutral communities with a wide variety of grasses and herbs such as Common Bent Agrostis capillaris, Yellow Oat-grass Trisetum flavescens, Red Fescue Festuca rubra, Crested Dogstail Cynosurus cristatus, Common Sorrel Rumex acetosa, Lesser Stitchwort Stellaria graminea, Birds-foot-trefoil Lotus corniculatus, Self Heal Prunella vulgaris and Meadow Vetchling Lathyrus pratensis. The flat valley floor, which is subject to the periodic flooding, is predominantly covered by grasses and Hairy Sedge Carex hirta, with patches of ruderal species such as Bramble Rubus fruticosus, Creeping Yellow Rorippa sylvestris, Goosefoot Chenopodium spp, and Marsh Cudweed Gnaphalium uliginosum. The wet swallowholes and streamside support a characteristic flora including Pink Water-speedwell Veronica catenata, Brooklime Veronica beccabunga, Water-pepper Polygonum hydropiper, Water-plantain Alisma plantago-aquatico, Plicate Sweet-grass Glyceria plicata, Mint Mentha spp and Gypsywort Lycopus europaeus.

South of the meadow an area of wet woodland adds further diversity to the site. Ash Fraxinus excelsior and Oak Quercus robur dominate the higher canopy with Hornbeam Carpinus betula, Hazel Corylus avellana and Blackthorn Prunus spinosa amongst the shrub species. The ground flora includes Bluebell Endymion non-scriptus, Wood Millet Millium effusum and notably Greater Tussock-sedge Carex paniculata in the wetter areas. Scattered trees are also found in the meadow, while patches of Hawthorn Crataegus monogyna and Elder Sambucus nigra grow along the boundaries, enhancing the site's scenic quality.

DATE: 16th December 1988

2.9 / 014



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Other Species

Visib: 21/1/87

✓ found in 1988 2 miles. WSA

[illegible]

The second swallow-hole, lower down, contained some water but had no stream running into it. It is rather smaller. Chalk was shown in it, almost to the surface, and it, too, had been banked to prevent water passing it.

W. HILL has given the following description of a swallow-hole in the valley southward of Almshoe Bury, in the parish of Ippollitts, in an account of an excursion. It is "at the upper end of a long narrow meadow. There is a depression of about 10 yds. across, and about the centre of it is a basin 8 ft. by 4 ft. and $2\frac{1}{2}$ ft. deep. Into this the water draining from the valley runs and disappears. Unfortunately, in consequence of a five weeks' drought, the quantity was a mere trickle (27 April, 1912), but in wet weather the amount is considerable. . . . The meadow itself, about 350 yds. in length by 80 in breadth, is a depression some 10 ft. below the surrounding levels. . . . Whether the water finds its way into the Chalk or into drift filling the valley is a matter for investigation."¹

~~107~~ 107

MEMOIRS OF THE GEOLOGICAL SURVEY.

ENGLAND AND WALES.

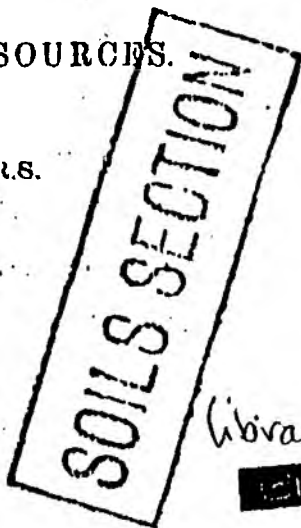
THE WATER SUPPLY
OF
BUCKINGHAMSHIRE

AND OF
HERTFORDSHIRE

FROM UNDERGROUND SOURCES.

BY

W. WHITAKER, B.A., F.R.S.



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1921

COUNTY: HERTFORDSHIRE

SITE NAME: KNEBWORTH WOODS

DISTRICT: NORTH HERTFORDSHIRE

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981

Local Planning Authority: North Hertfordshire District Council

National Grid Reference: TL 228223 Area: 120.8 (ha.) 298.5 (ac.)

Ordnance Survey Sheet 1:50,000: 166 1:10,000: TL 22 SW

Date Notified (Under 1949 Act): 1954 Date of Last Revision: 1968

Date Notified (Under 1981 Act): 1985 Date of Last Revision:

Other Information:

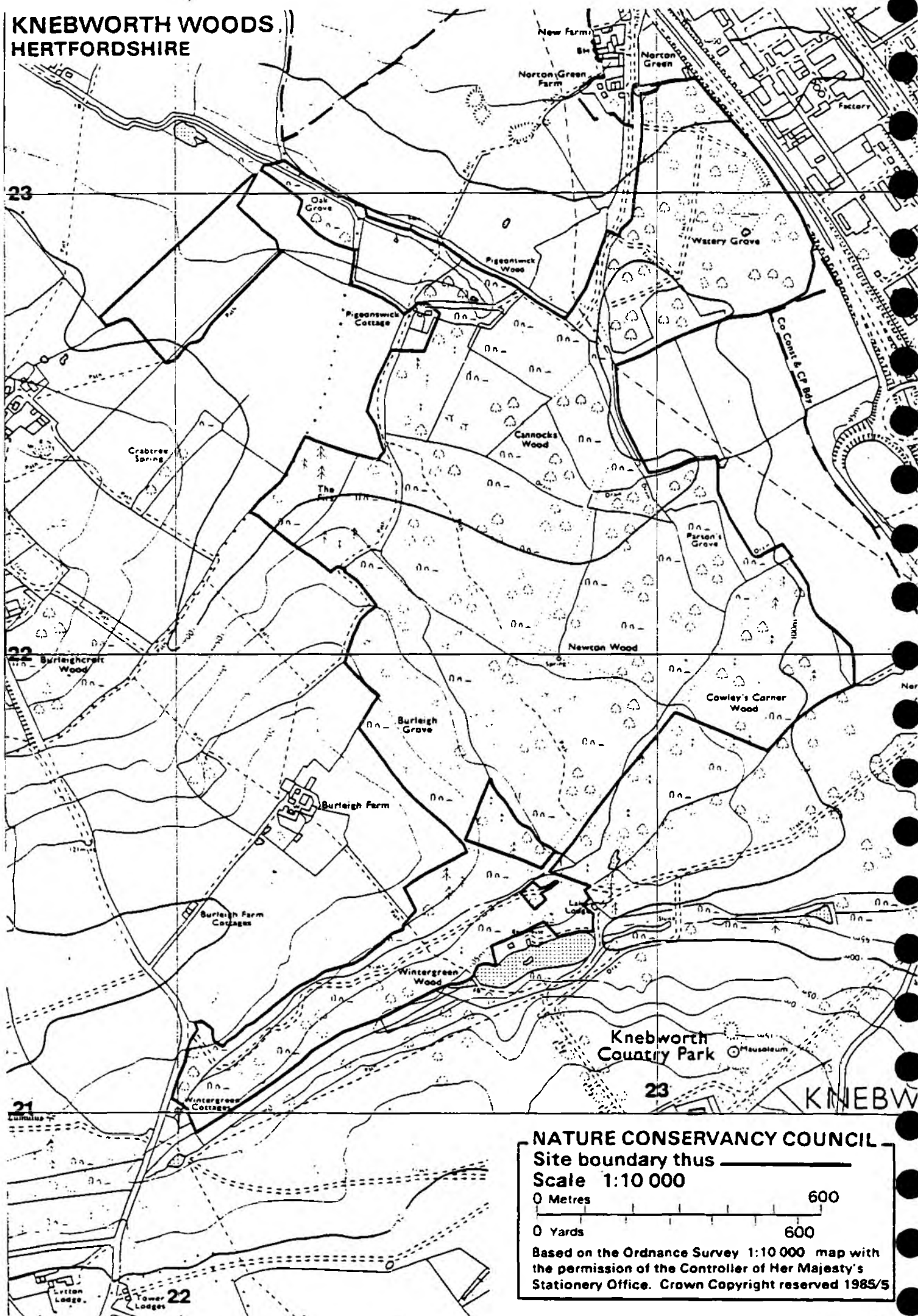
Reasons for Notification:

This woodland site is of a type nationally rare, but well represented in Hertfordshire. It is a most important woodland in the north of the county lying on poorly drained acidic soils derived from underlying clay-with-flints. It is almost all ancient in origin and is ecologically diverse with rides, ponds and small areas of both acidic and neutral grassland.

Oak Quercus robur and Oak/Hornbeam Quercus robur/Carpinus betulus are the dominant woodland types with some mixed-deciduous type characteristic of south east England. In the main part of the wood coppiced Hornbeam is over-mature and ground flora is suppressed. Other areas such as Watery Grove are currently being coppiced resulting in diversification with Ground Ivy Glechoma hederacea, Bugle Ajuga reptans and Primrose Primula vulgaris. The mixed deciduous wood contains Ash Fraxinus excelsior, Downy Birch Betula pubescens and Aspen Populus tremula together with Oak. A heathy element in the rides produces locally rare species Green-ribbed Sedge Carex binervis and Heath Milkwort Polygala serpyllifolia. Small areas of the site have been felled and replanted but are currently under management to promote some regeneration of semi-natural woodland. The ponds contain two plant species rare in Hertfordshire, Water Violet Hottonia palustris and Fine-leaved Water Dropwort Oenanthe aquatica. The woodland is known as a site rich in fungi and bryophytes, and breeding nightingales are indicative of the diverse bird community.

Burleigh Meadow, acidic grassland, supports some heathland flora including Petty Whin Genista anglica and Dyers Greenweed Genista tinctoria in drier areas, and Lousewort Pedicularis sylvatica where wetter, all three species being county rarities. The neutral grassland meadow is still the best Hertfordshire site for Green-winged Orchid Orchis morio despite some limited damage in the past. The south east boundary of the meadow is formed by a line of old coppiced Hornbeam.

KNEBWORTH WOODS, HERTFORDSHIRE



NATURE CONSERVANCY COUNCIL

Site boundary thus ———

Scale 1:10 000

0 Metres

600

0 Yards

600

Based on the Ordnance Survey 1:10 000 map with the permission of the Controller of Her Majesty's Stationery Office. Crown Copyright reserved 1985/5

Plant lists for compartments at Watery Grove (see attached map)
 survey by B.R. Sawford 11/8/71.

Area A.

Populus tremula (saplings); *Carpinus betulus*; *Quercus robor*
Betula pubescens; *Endymion non-scriptus*; *Sambucus nigra*;
Prunus spinosa (seedling); *Urtica dioica*; *Glechoma hederacea*;
Rubus fruticosus agg.; *Viola reichenbachiana*;
Dryopteris filix-mas; *Poa annua*; *Ajuga reptans*; *Ulmus procera*;
Primula vulgaris; *Dryopteris* ^{*dilatata*} ~~*carthusiana*~~; *Viola riviniana*;
Larix decidua; *Scrophularia nodosa*;

Area B.

Sambucus nigra; *Quercus robor*; *Carpinus betula*;
Rubus fruticosus agg.; *Corylus avellana*; *Glechoma*
hederacea; *Fraxinus excelsior*; *Endymion non-scriptus*;
Moehringia trinervia; *Prunus spinosa*; *Crataegus*
oxyacanthoides; *Phallus impudicus*; *Urtica dioica*;
Chamaenerion angustifolium; *Cirsium palustre*; *Holcus lanatus*;
Stellaria graminia; *Galium mollugo*; *Veronica chamaedrys*;
Arum maculatum; *Primula vulgaris*; *Poa annua*;
Rumex acetosa; *Circaea lutetiana*;

Area C.

Not surveyed due to dense nature of vegetation, that
 has been 'brashed' down for Huntjac!

Area D

Carpinus betula; *Endymion non-scriptus*;
Quercus robor; *Betula pubescens*; *Sambucus nigra*;
Phallus impudicus; *Fraxinus excelsior*.

This area overgrazed by Rabbits, also much disturbance
 due to their burrowing activities.

Area E

Betula pubescens; *Quercus robor*; *Pteridium aquilinum*;
Rubus fruticosus agg.; *Juncus effusus*; *Holcus lanatus*;
Eudymion non-scriptus; *Sambucus nigra*; *Crataegus*
monogyna; *Oxalis acetosella*; *Moehringia trinervia*.

Pond P1

Myosotis caespitosa; *Carex pallescens*; *Urtica dioica*;
Glechoma hederacea; *Juncus effusus*; *Cirsium palustre*;
Cirsium arvense; *Ranunculus repens*; *Lysimachia*
nummularia; *Veronica beccabunga*; *Gratiophalum*
sylvatica; *Barbarea vulgaris*; *Solanum dulcamara*;
Rumex sanguinea; *Galium palustre*; *Chenopodium*
album; *Callitriche stagnalis*; *Scrophularia nodosa*.

Area N.

Scrophularia nodosa; *Rumex sanguinea*;
Rubus fruticosus agg.; *Urtica dioica*; *Primula vulgaris*;
Corylus avellana; *Pteridium aquilinum*;
Ajuga reptans; *Glechoma hederacea*; *Betula pubescens*;
Quercus robor; *Oxalis acetosella*; *Lonicera*
periclymenum; *Holcus lanatus*; *Dryopteris filix-mas*;
Lysimachia nemorum;

Area F.

This area coppiced and cleared.

Carpinus betula; *Betula pubescens*; *Holcus lanatus*;
Populus tremula (seedlings); *Rubus fruticosus* agg.;
Chamaenerion angustifolium; *Urtica dioica*; *Juncus effusus*;
Cirsium palustre; *Agrostis stolonifera*; *Sambucus nigra*;
Quercus robor; *Eudymion non-scriptus*; *Dryopteris filix-mas*;
Carduus crispus; *Ajuga reptans*;

Area G.

Lysimachia nemorum; *Circaea lutetiana*; *Holcus lanatus*; *Cirsium palustre*; *Populus tremula* (seedlings);
Lonicera periclymenum; *Rubus fruticosus* agg.;
Oxalis acetosella; *Agrostis stolonifera*;
Chamaenerion angustifolium; *Juncus effusus*;
Betula pubescens; *Quercus robur*; *Carpinus betula*;
Ajuga reptans; *Viola riviniana*;
Sambucus nigra (seedlings); *Solanum dulcamara*;
Glechoma hederacea; *Lycopus europaeus*;
Scrophularia nodosa; *Hypericum tetraplerum*;
Urtica dioica; *Mentha arvensis*; *Carex acutiformis*;
Cirsium arvense; *Tussilago farfara*; *Arctium minus*; w;
Prunella vulgaris; *Veronica serpyllifolia*; *Hypericum humifusum*;
Ranunculus repens; *Rumex sanguinea*;
Sonchus oleraceus; *Scrophularia nodosa*;
Mochringia trinervia; *Viola reichenbachiana*;
Carpinus betula (seedlings).

Pond P2.

Juncus effusus; *Myosotis caespitosa*; *Urtica dioica*;
Rumex obtusifolius; *Carex acutiformis*; *Glechoma hederacea*;
Salix cinerea; *Lysimachia nummularia*;
Veronica beccabunga; *Ranunculus flammula*;
Callitriche stagnalis; *Oenanthe aquatica*;
Lycopus europaeus; *Galium palustre*; *Poa nemoralis*.

Area H.

Betula pubescens; *Carpinus betula*; *Ajuga reptans*;
Oxalis acetosella; *Populus tremula*; *Endymian non-scriptus*;
Quercus robur; *Urtica dioica*; *Glechoma hederacea*;
Circaea lutetiana; *Rubus fruticosus* agg.; *Sambucus nigra*;
Dryopteris filix-mas; *D. ^{dilatata} carthusiana*; *Athyrium*

Area I.

Carpinus betula; *Quercus robur*; *Betula pubescens*; *Rubus fruticosus* agg.; *Corylus avellana*; *Ulmus glabra*; *Lonicera periclymenum*; *Holcus lanatus*; *Ulmus procera*; *Agrostis stolonifera*; *Circaea lutetiana*; *Sambucus nigra*; *Oxalis acetosella*; *Dryopteris filix-mas*; *Dryopteris dilatata*; *Urtica dioica*; *Ajuga reptans*; *Glechoma hederacea*; *Chamaenerion angustifolium*; *Juncus effusus*; *Solanum dulcamara*; *Stachys sylvatica*; *Heather aquatica*; *Lysimachia nummularia*; *Viola reichenbachia*; *Cirsium arvense*; *Poa trivialis*;

Area J.

Carpinus betula; *Quercus robur*; *Rubus fruticosus* agg.; *Ajuga reptans*; *Viola reichenbachia*; *Populus tremula*; *Holcus lanatus*; *Lonicera periclymenum*; *Urtica dioica*; *Salix cinerea*; *Ulmus procera*; *Scrophularia nodosa*; *Clematis vitalba*;

Area K.


Populus tremula; *Quercus robur*; *Pteridium aquilinum*; *Urtica dioica*; *Lysimachia nummularia*; *Circaea lutetiana*; *Glechoma hederacea*; *Corylus avellana*; *Galium aparine*; *Rubus fruticosus* agg.; *Agrostis stolonifera*; *Deschampsia caespitosa*; *Poa trivialis*; *Viola reichenbachia*; *Juncus effusus*; *Betula pubescens*; *Holcus lanatus*; *Carpinus betula*; *Oxalis acetosella*; *Sambucus nigra*; *Cirsium palustre*; *Potentilla reptans*; *Cirsium arvense*; *Urtica dioica*; *Rumex obtusifolius*; *Juncus articulatus*; *Poa nemoralis*; *Carex pallescens*;

Area L.

Carpinus betula; *Quercus robur*; *Erdynian non-scriptus*;

- *Primella vulgaris*; *Glechoma hederacea*; *Ajuga reptans*;
- *Crataegus oxyacanthoides*; *Circaea lutetiana*; *Salix* sp.
- *Primula vulgaris*; *Sambucus nigra*; *Carex hirta*;
- *Ranunculus repens*; *Cirsium arvense*; *Callitriche*
- *stagnalis*; *Rosa* sp.; *Scrophularia nodosa*; *Lapsana*
- *communis*; *Fragaria vesca*; *Potentilla sterilis*; *Holcus*
- *lanatus*; *Dryopteris filix-mas*; *Cornus sanguinea*;
- ~~*Cyperus*~~ *Carex pseudocyperus*; *Lolus uliginosus*; *Oenanthe*
- *aquatica*;

● Pond P3.

- *Alisma plantago aquatica*; *Cirsium palustre*; *Holcus lanatus*;
- *Circaea lutetiana*; *Scrophularia aquatica*; *Lycopus europaeus*;
- *Acer campestre*; *Rubus fruticosus* agg.; *Stachys sylvatica*;
- *Hypericum perforatum*; *Filipendula ulmaria*; *Carex*
- *pseudocyperus*; *Lolus uliginosus*; *Oenanthe aquatica*;
- *Pulicaria dysenterica*; *Ranunculus repens*; *Mentha aquatica*;
- *Tussilago farfara*; *Ranunculus repens*; ~~*Aster*~~ *Arctium minus*;
- *Ranunculus flammula*; *Callitriche stagnalis*; *Populus*
- *trémula*; *Deschampsia caespitosa*; *Juncus effusus*;
- *Salix cinerea*; *Endymion non-scriptus*; *Primula vulgaris*;
- *Ajuga reptans*; *Myosotis caespitosa*; *Centaurea erythraea*;
- *Lychais flos-auculi*; *Glechoma hederacea*; *Fragaria vesca*;
- *Primella vulgaris*; *Hypericum tetrapterum*; *Viola reichenbeckii*;
- *Epipactis helleborine* (5 plants); *Crataegus oxyacanthoides*;
- *Carpinus betula*; *Quercus robor*; 

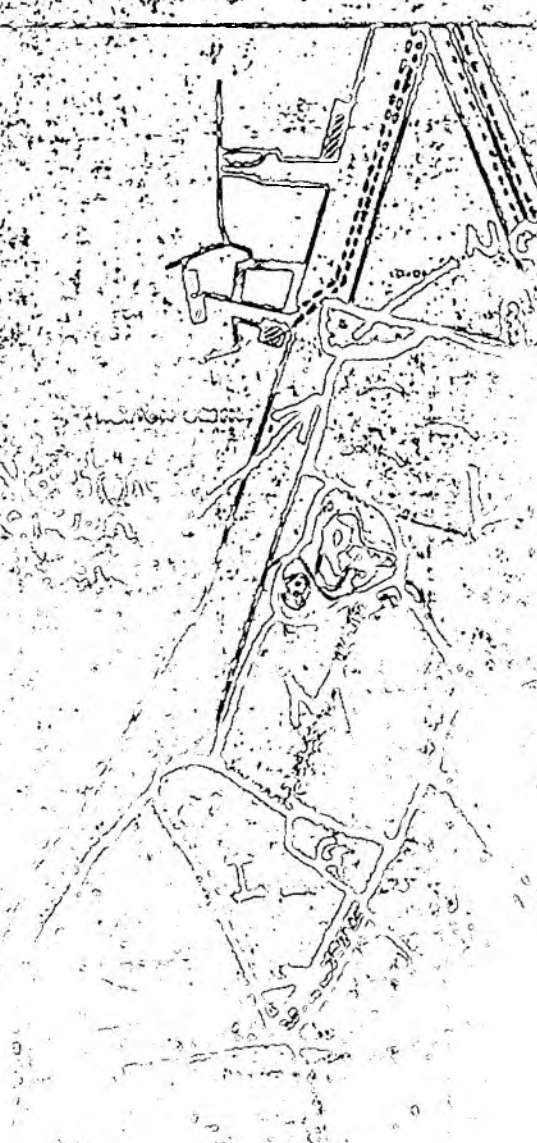
● Area 01.

- *Populus tremula*; *Carpinus betula*; *Primula vulgaris*;
- *Glechoma hederacea*; *Ajuga reptans*; *Circaea lutetiana*;
- *Endymion non-scriptus*; *Rubus fruticosus* agg.; *Betula*
- *pubescens*; *Rosa* sp.; *Urtica dioica*; *Quercus robor*;
- *Primella vulgaris*; *Poa trivialis*; *Crataegus oxyacanthoides*;
- *Cirsium palustre*; *Scrophularia aquatica*; *Hypericum*
- *tetrapterum*; *Holcus lanatus*.

TL 22/G2

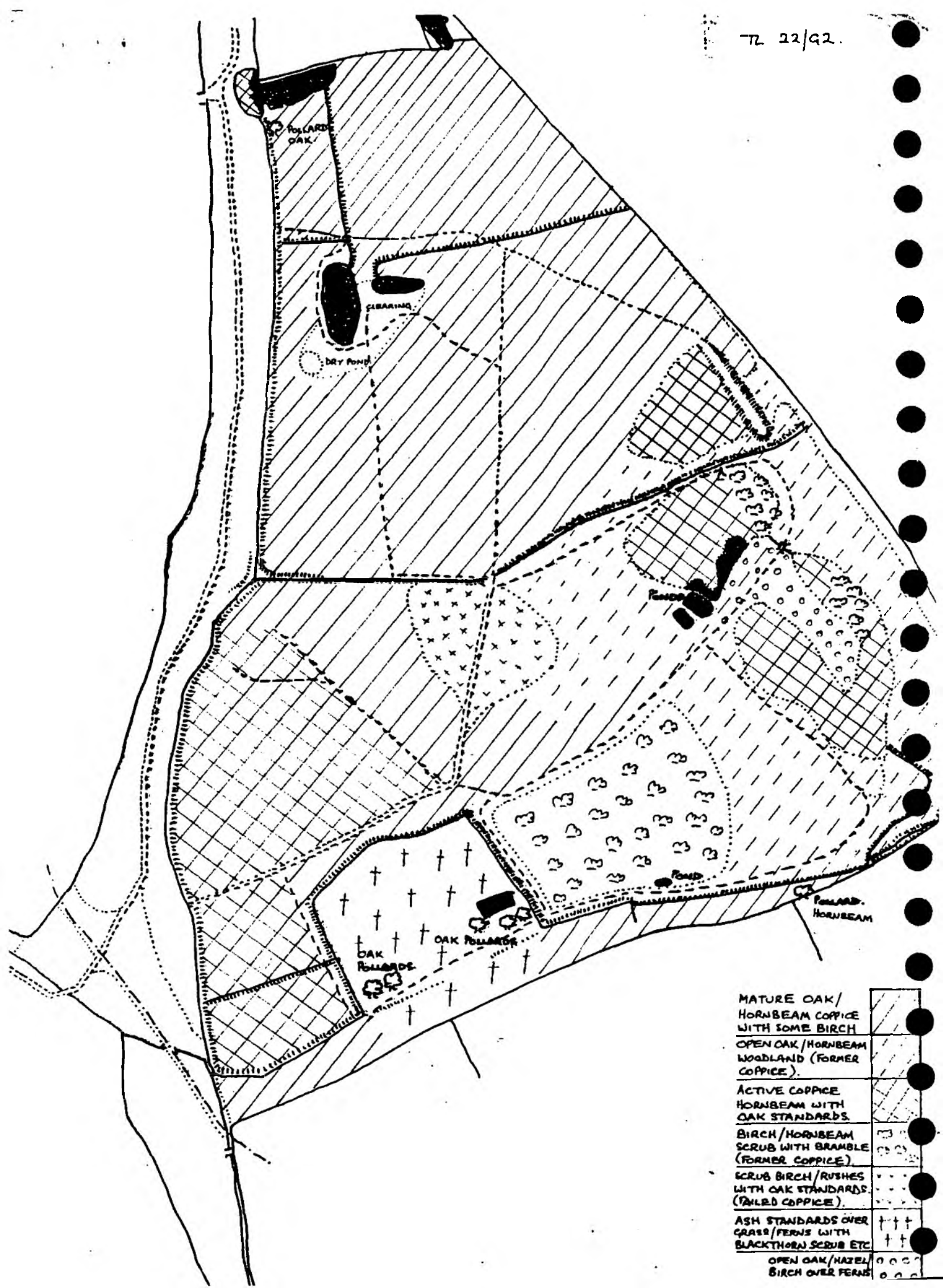
WATERWAY

Tract for



11 22 OCT

Map
Surv



MATURE OAK/
HORNBEAM COPPICE
WITH SOME BIRCH

OPEN OAK/HORNBEAM
WOODLAND (FORMER
COPPICE).

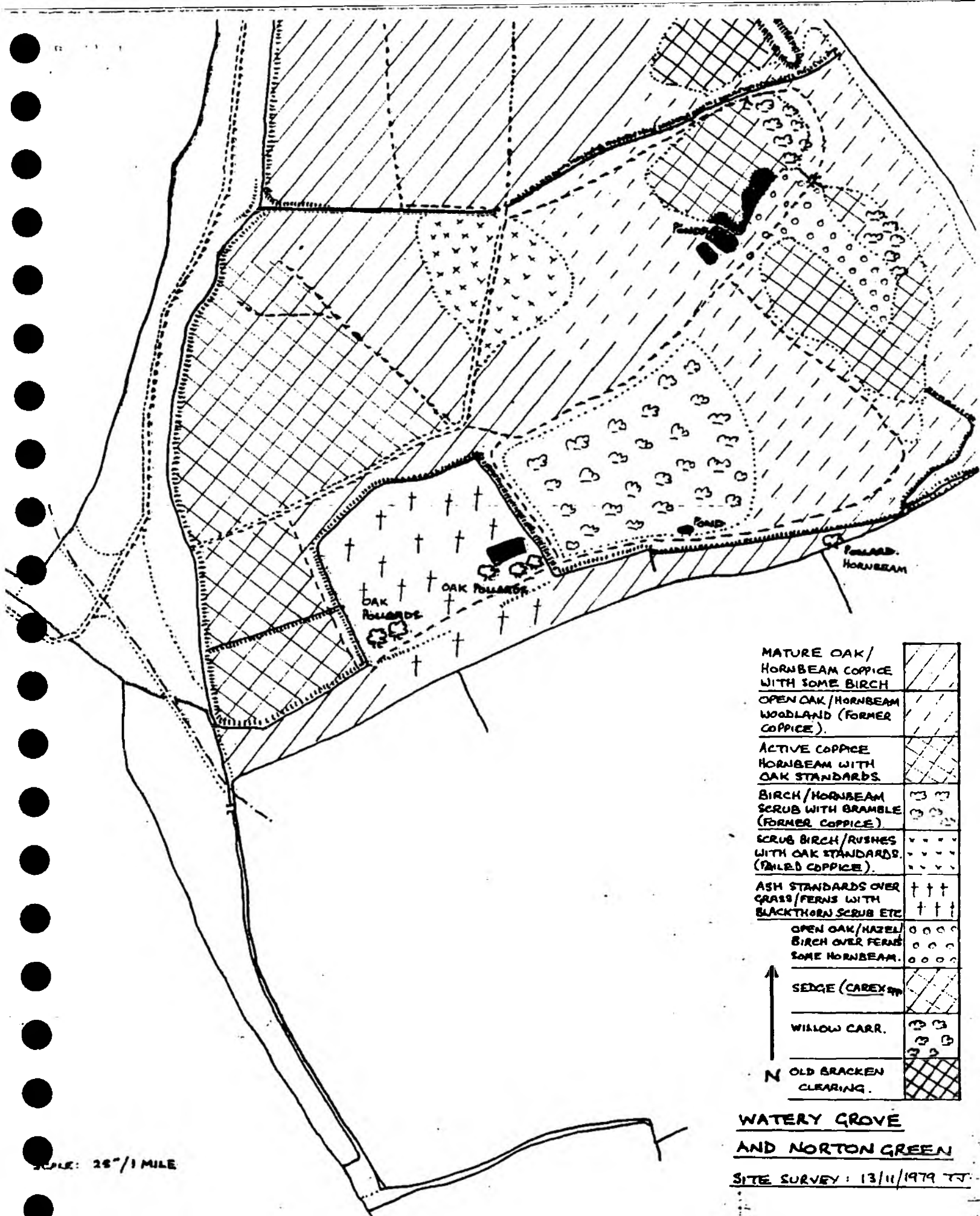
ACTIVE COPPICE
HORNBEAM WITH
OAK STANDARDS.

BIRCH/HORNBEAM
SCRUB WITH BRAMBLE
(FORMER COPPICE)

SCRUB BIRCH/RUSHES
WITH OAK STANDARDS.
(TAILED COPPICE).

ASH STANDARDS OVER
GRASS/FERNS WITH
BLACKTHORN SCRUB ETC

OPEN OAK/HAZEL
BIRCH OVER FERNS



| | |
|---|--|
| MATURE OAK/ HORNBEAM COPPICE WITH SOME BIRCH | |
| OPEN OAK/HORNBEAM WOODLAND (FORMER COPPICE). | |
| ACTIVE COPPICE HORNBEAM WITH OAK STANDARDS. | |
| BIRCH/HORNBEAM SCRUB WITH BRAMBLE (FORMER COPPICE). | |
| SCRUB BIRCH/RUSHES WITH OAK STANDARDS. (PAILED COPPICE). | |
| ASH STANDARDS OVER GRASS/FERNS WITH BLACKTHORN SCRUB ETC. | |
| OPEN OAK/HAZEL/ BIRCH OVER FERNS SOME HORNBEAM. | |
| SEDGE (<i>CAREX</i>) | |
| WILLOW CARR. | |
| N OLD BRACKEN CLEARING. | |

HERTFORDSHIRE POND SURVEY: 1986 X

| | | | |
|-------------------------------------|--|---------------------------------------|-------------------|
| Site name <i>Norton Green Pond.</i> | Map No. <i>29</i> | Grid ref. ^{TL} <i>230233</i> | Site no. <i>1</i> |
| Owner | Status | Photo frame no. | |
| Surveyor <i>MJH.</i> | Date <i>12.10.88</i> , (<i>20 min</i>) | | |

MANAGEMENT

| | | | | | | | | | |
|---------------------|-------------------------------------|------------|--|------------------|--|-------------|--|--------------------|--|
| Unmanaged | <input checked="" type="checkbox"/> | Fishing | | Stock watering | | Wildfowling | | General recreation | |
| Nature conservation | | Ornamental | | Other (specify): | | | | | |

INDICATORS, COMMENTS *Pond on N edge of Watery Grove, (neglected Cb. coppice and part of SSSI) Interest & pond declining rapidly due to *Typha* encroachment and shading.*

HABITAT DETAILS

| | | | | | | | | |
|----------------------|-----------------|------------|---------------|-------------------------------------|----------|----------|------|--|
| 1. Origin | Spring-fed pool | | Drainage pond | <input checked="" type="checkbox"/> | Dew pond | | Moat | |
| Natural flood-hollow | | Gravel pit | | Artificial dam | | Bog pool | | |

Other (specify):

| | | | | | | | | | | | |
|---------------------------|-------------------------------------|--|---|--------------------------|-------------------------------------|------------------|---------------|-----------------|-------------------------------------|-------|---------------|
| 2. Habitat features | Open water present | <input checked="" type="checkbox"/> | % area: <i>60%</i> (<i>15% with no trees cover</i>) | pH: | | | | | | | |
| Marginal marsh present | <input checked="" type="checkbox"/> | Main species: <i>Juncus inflexus</i> , <i>Vernonia beccati</i> . | | Extent: <i>rare</i> . | | | | | | | |
| Floating aquatics present | <input checked="" type="checkbox"/> | Main species: (<i>Callitriche</i> sp) | | | | | | | | | |
| Gravel bottom | | Clay bottom | | Silt bottom | <input checked="" type="checkbox"/> | Depth | <i>1-2 ft</i> | Detritus bottom | <input checked="" type="checkbox"/> | Depth | <i>1-2 ft</i> |
| Other substrate: | | | | | | Estimated depth: | | | | | |
| Steep banks present | <input checked="" type="checkbox"/> | % length: <i>5%</i> | Concrete banks | <input type="checkbox"/> | % length: | | | | | | |
| Trampled margins | <input type="checkbox"/> | % length: | Wooden structures in/by water | <input type="checkbox"/> | | | | | | | |

| | | | | | | |
|--------------------------|-------------------------------------|--|-------------------------------------|-------------------------------------|--|--|
| 3. Neighbouring land-use | Woodland | <input checked="" type="checkbox"/> | Scrub | <input checked="" type="checkbox"/> | Common land/village green | |
| Pasture | <input checked="" type="checkbox"/> | Kind of stock present: <i>!</i> | | | Access open to pond: Yes / No (<i>Yes</i>) | |
| Arable | | Separated from pond by barrier? (type): <i>scrub + fence</i> . | | | | |
| Housing | | Road | <input checked="" type="checkbox"/> | Other (specify): | | |

PLANT COMMUNITIES & ZOOLOGICAL SAMPLE

| | | | |
|---|------------|---|--|
| Weather conditions: <i>Bright + sunny</i> | | Air temp. | <i>relatively cold (1)</i> |
| AREAS SAMPLED | Open water | Marginal veg. & mud <input checked="" type="checkbox"/> | Emergent veg & mud <input checked="" type="checkbox"/> |

HABITATS SAMPLED

| | | | | | |
|-----------------|--|--------|--|----------------|-------|
| Bottom deposits | Silt | Gravel | Large stones | Plant detritus | Other |
| Vegetation | Marginal (type?) <input checked="" type="checkbox"/> | | Emergent (type?) <input checked="" type="checkbox"/> | | |
| | Floating (type?) | | Submerged (type?) | | |
| Other (state) | | | | | |

INVERTEBRATE SAMPLE

| Group | Genus/species | Abundance | Group | Genus/species | Abundance |
|-----------------------|--------------------|------------------|---------------------|----------------------|-----------|
| Sponges | Euspongia | | Plecoptera | Nymphs/adults | |
| Platyhelminthes | | | Ephemeroptera | Nymphs/adults | |
| Oligochaeta | Tubifex | | Odonata (adults) | Aeshna grandis | |
| | Others | | | A. cyanea | |
| Hirudinea | All genera | | | Libellula depressa | |
| Gastropod molluscs | Valvata spp. | | | Enallagma/Coenagrion | |
| | Potamopyrgus | | | Ischnura elegans | |
| | Bithynia spp. | | Others | | |
| | Physa spp. | | Nymphs | | |
| | Lymnaea truncatula | | Hemiptera | Notonecta spp. | |
| | L. Palustris | | | Corixa etc. | |
| | L. stagnalis | | | Gerris spp. | |
| | L. Auricularia | | | Hydrometra | |
| | L. peregra | | | Velia etc. | |
| | Planorbis (type) | | | Nepa cinerea | |
| Planorbarius corneus | | Ranatra linearis | | | |
| Acroloxus lacustris | | Ilyocoris | | | |
| Succinea/Oxyloma spp. | | Plea leachi | | | |
| Deroceras laeve | | Megalopectera | | Sialis (ad./larvae) | |
| Bivalve molluscs | Unio spp. | | | | |
| | Anodonta cygnea | Trichoptera | All genera | | |
| | A. Anatina | Coleoptera | Dytiscus marginalis | | |
| | Sphaerium spp. | | Other dytiscids | | |
| | Pisidium spp. | | Dytiscid larvae | | |
| Cladocera | | | Hygrobia herrmanni | | |
| Ostracoda | | | Gyrinus spp. | | |
| Copepoda | | Diptera | Others | | |
| Isopoda | Asellus | | Culicid larvae | | |
| Amphipoda | Gammarus etc. | | Chironomid larvae | | |
| Hydracharina | | | Syrphid larvae | | |
| Araneae | Argyroneta | | | | |

Other invertebrates of note:

PLANT ABUNDANCE CODES: RARE (R); OCCASIONAL (O); FREQUENT (F); ABUNDANT (A)
PLANT COMMUNITIES

(*: denotes reference specimen should be collected)

| Marginal species | | Emergent species | | Floating/submergent species | |
|-----------------------|--------|-----------------------------|-------|-----------------------------|----|
| Alisma spp. | | Apium nodiflorum | | Azolla filiculoides | |
| Bidens spp. | | *Ceratophyllum spp. | | Callitriche spp. | LF |
| Cardamine pratensis | | Hippuris vulgaris | | Elodea spp. | |
| Carex acutiformis | | *Myriophyllum spp. | | Lemna minor | |
| C. riparia | | Nasturtium spp. | | Lemna trisulca | |
| C. pendula | | Phragmites australis | | *Lemna gibba | |
| Carex (others) | | Potamogeton natans | | *Lemna polyrhiza | |
| *Catabrosa aquatica | | *Potamogeton (others) | | Nuphar lutea | |
| Eleocharis palustris | | Ranunculus spp. (crowfoots) | | Nymphaea alba | |
| Epilobium hirsutum | | Rorippa spp. | | Nymphoides peltata | |
| Epilobium (others) | | Stratiotes aloides | | *Utricularia spp. | |
| Filipendula ulmaria | | Typha latifolia | | Other species: | |
| Glyceria maxima | | Veronica beccabunga | LF-A. | | |
| Glyceria (others) | | V. anagallis-aquatica | | | |
| Iris pseudacorus | | Veronica (others) | | | |
| Juncus inflexus | O | *Zannichellia palustris | | | |
| J. articulatus | | Other species: | | | |
| J. effusus | | | | | |
| Juncus (non-det.) | | | | | |
| Lychnis flos-cuculi | | | | | |
| Mentha aquatica | | | | | |
| Myosotis spp. | O | | | | |
| Phalaris arundinacea | | | | | |
| Ranunculus flammula | | | | | |
| Ranunculus sceleratus | | | | | |
| Scrophularia aquatica | | | | | |
| Sparganium erectum | | | | | |
| Lycopus europaeus | O - LF | | | | |
| Lysimachia nemoralis | LF - O | | | | |

VERTEBRATE SPECIES NOTED

| Group | Species | Notes | Group | Species | Notes |
|------------|--------------------------|-------|---------|----------------|----------|
| Fish | Three-spined Stickleback | | Birds | Moorhen | present. |
| | Nine-spined Stickleback | | | Mallard | |
| | Roach | | | Dabchick | |
| | Perch | | | Reed Bunting | |
| | Carp spp. | | | Sedge Warbler | |
| | Tench | | | Other species: | |
| | Pike | | | | |
| | Others: | | | | |
| Amphibians | Smooth Newt | | Mammals | Water Vole | |
| | Crested Newt | | | Water Shrew | |
| | Common Frog | | | | |
| | Common Toad | | | | |
| Reptiles | Grass Snake | | | | |

GENERAL COMMENTS:

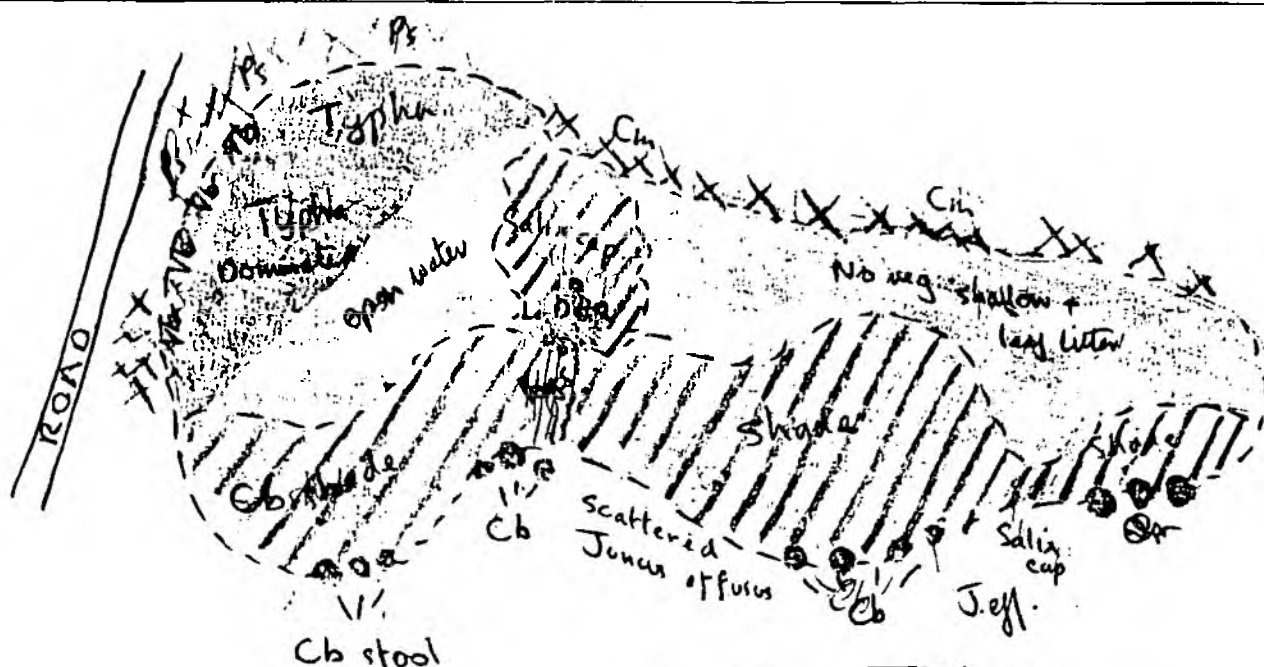
4. Habitat condition

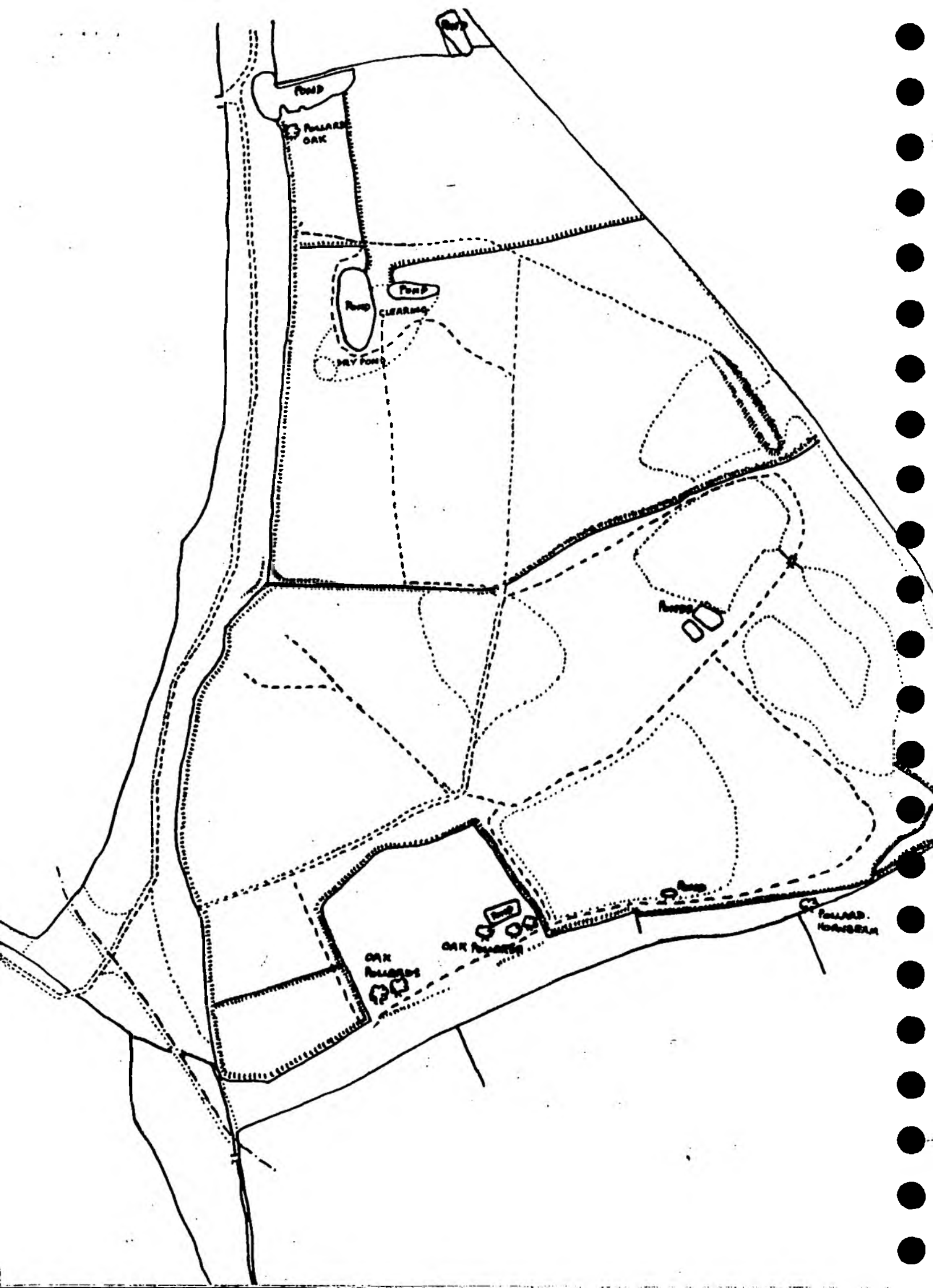
Is the pond influenced by any of the following?

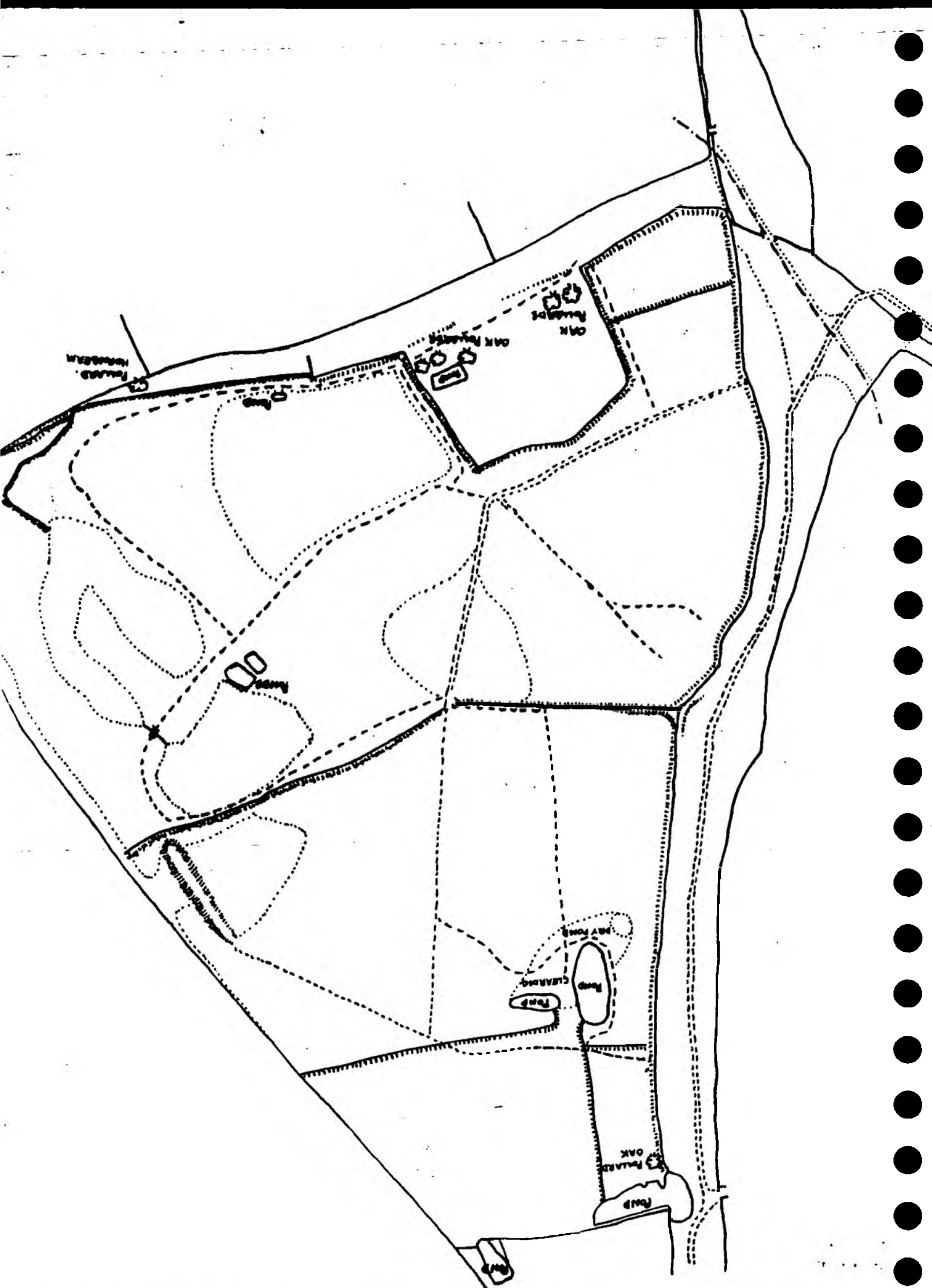
| | | | | | | |
|--|--------|--|---|-----------------------------------|-------------------------|------------|
| Isolated from other wetlands | | Within 400m of other wetlands | | ✓ | Part of a linked series | |
| Evidently silted | ✓ | Affected by rubbish dumping | | Polluted | Source: | |
| Adversely affected by neighbouring land use | | How? | | Deliberately infilled: Part / all | | |
| Water level acceptable for time of year/weather | | ✓ | Evidently low | ✓ | Dried out (cause?) | |
| Invaded by scrub/carr | ✓ | Main species: <i>Salix caprea</i> in part | | | | |
| Overgrown by marsh (i.e. little/no open water) | | ✓ | Species causing problem: <i>Typha latifolia</i> | | | |
| Damaged by excessive human use (e.g. over-trampled, over-fished) | | State activities noted: | | | | |
| Over-shaded by adjacent trees | ✓ | Species: mainly <i>Cb</i> , + <i>Qr</i> , <i>S cap</i> . | | | Extent (%) 40% at least | |
| Seriously eutrophied (e.g. with algal bloom) | | State evidence: | | | | |
| Water clarity | Turbid | Stained (e.g. peat) | | Average | ✓ | Very clear |

SITE LOCATION MAP(S)

Complete rough site plan and location map (Highlighting any important/unusual features)







29/22

HERTS CL 261

NATIONAL SURVEYS RESEARCH UNIT
DEPARTMENT OF GEOGRAPHY,
U.C.W., ABERYSTWYTH.

BIOLOGICAL SURVEY OF COMMON LAND

NATURE
CONSERVANCY
COUNCIL

Site No: [261] County: HERTFORDSHIRE CODE [27] Grid ref: [5 229 2 230] 10 Km sq. [TL22] O.S. Sheet: [166]
Status: [F] Area (ha): [3.153] Altitude: Max. [105] Med. [] Min. [100] Vice County: [20]

Site Name: NORTON GREEN (SSSI) Date of Visit: [19.07.88]
[C] C = Information Collated

Recorder/ [IF] Time on [1h 00m] No. of [1] Access permission
Compiler: Site: photographs: from:

CONSERVATION [1] S [55] [] S [] [] S [] [] S [] [] S [] []

(S = % of site) 1 = SSSI 2 = NCR Site 3 = NRM 4 = LNR 5 = ESA 6 = SPA 7 = National Park
8 = AONB 9 = Heritage Coast 10 = County Trust 11 = National Trust 12 = RSPB 13 = Ramsar 14 = Other (specify below)

General description of site: A wide green lane, largely dominated by scrub and woodland, with amenity and rough grassland and a small pond.

Owner(s): Stevenage U.D.C. registered.

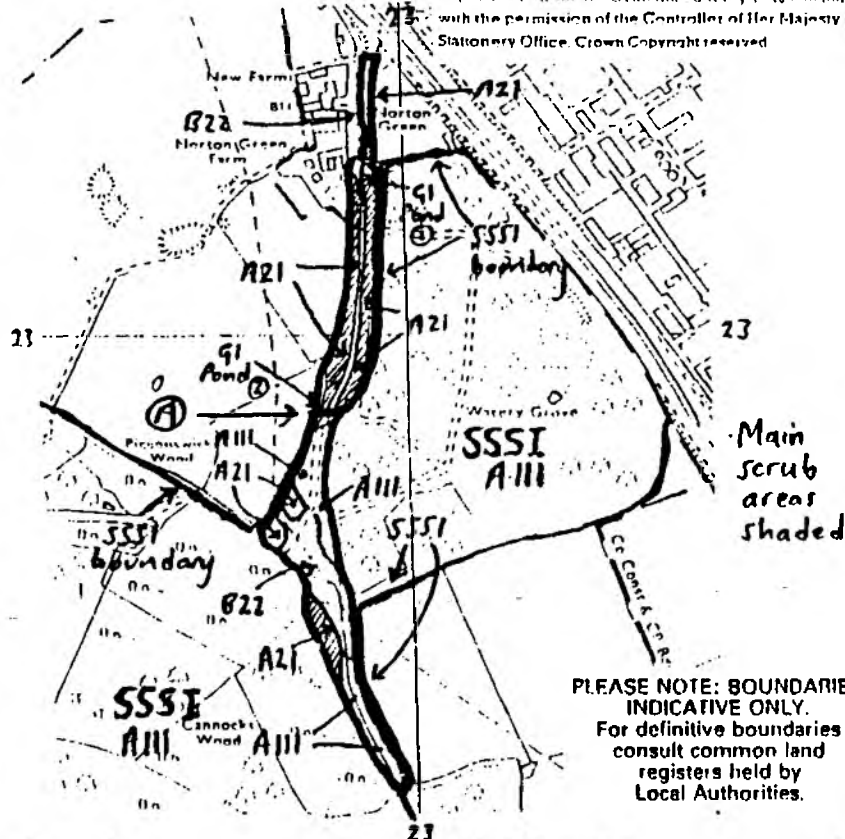
| HABITATS (NVC/Phase 1) + Descriptions: | Areas (ha.) | Public access and recreation: |
|--|-------------|--|
| A21 Continuous scrub | 1.8 | <u>Open access - tarmac-covered track runs the length of the northern half of the site. The common is crossed by a public footpath. The Southern section is rather less used, although there are several small tracks.</u> |
| A111 Broad-leaved woodland | 0.9 | |
| B22 Semi-impr. neutral grassland | 0.82 | |
| G1 Small ponds | 0.01 | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | | | |
|---|--|-------------------------|---|
| MANAGEMENT: | | Total Area: 3.53 | SITE CHARACTERISTICS: |
| Hay | Grazing Time: | Grazing Intensity: | Main Geology [] [] [] Main Soils [] [] [] |
| Mown <input checked="" type="checkbox"/> | Spring | <u>None.</u> | Slope [0°] Aspect [0°] |
| Cattle | Summer | | Ridge + Furrow [] Flooding [] |
| Sheep | Autumn | | Scrub invasion <input checked="" type="checkbox"/> Mature trees (>60 cm DBH) <input checked="" type="checkbox"/> |
| Horses | Winter | | Much dead wood [] Base-rich wet flushes [] |
| Rabbits | All year | | Bare ground: <input checked="" type="checkbox"/> Origin <u>Wheel rut</u> |
| Punling | Irregular | | Litter accumulation: <input checked="" type="checkbox"/> Type <u>Leaf litter and grasses.</u> |
| Goats | | | |
| Surplus <input checked="" type="checkbox"/> | | | |
| Planting | | | |
| Thinning/felling | Managed by: | Management [] | General notes on site: |
| Fellarding | Conservators [] | Committee [] | <u>No rights. Overlaps with Knebworth Woods SSSI (c.1.9 ha of SSSI Common). Knebworth Woods are ancient oak & hornbeam woods. Nightingales present.</u> |
| Scrub clearance <input checked="" type="checkbox"/> | Other <input checked="" type="checkbox"/> | None [] | |
| Recreation | <u>Herts CC. CMS.</u> | | |
| Fisheries | Sources of information/references: | | |
| Dumping <input checked="" type="checkbox"/> | <u>HN Herts Museum Service File.</u> <u>NCC SSSI information for 'Knebworth Woods'.</u> <u>Invertebrate Site Register</u> <u>Field Visit.</u> | | |

(Show scale, north, adjacent habitats)

N 1:10,000

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Fauna: Birds recorded previously include Redpoll, Chiffchaff and Nightingale in 1980 and 1982. On visit, Yellowhammer, Robin, Blue Tit, Wren, Marsh Tit, Bullfinch, Nuthatch, Magpie, Wood Pigeon, Willow Warbler, Goldfinch and Spotted Flycatcher noted. Also Rabbits, Moles. Meadow Brown, Ringlet.

Knebworth Woods is ISR site, primarily for butterflies and beetle fauna. Norton Green has records of beetles especially related to aspen. 14 butterflies are recorded from the common, and also Aeshna mixta.

SSSI boundary crosses site at point (A) - the CL north of point (A) is excluded from the SSSI. The rest of the CL is in the SSSI.

Vegetation: The common runs almost due N-S, and the southern half lies within the SSSI. Around half of the site is dense scrub, mainly blackthorn, but with Salix sp., elder. Very shady underneath, with little ground flora; some species present include Galium aparine, Stachys sylvatica, Glechoma hederacea. There are some patches of Rubus fruticosus and Urtica dioica, and small open areas have MG1 grassland. Small ponds are found near (A) and at the N. end: this pond (1) is overgrown by Typha latifolia, with Lycopus europaeus, Epilobium hirsutum, Juncus effusus, J. inflexus, Veronica beccabunga, Lysimachia nummularia and Myosotis sp. There is some open water with Callitriche sp.. Pond (2) is shaded, with some J. effusus and Galium palustre. B22 grassland is an MG1 community, with Anthriscus sylvestris, Ranunculus repens, Calystegia sepium, tall herbs such as Heracleum sphondylium, and a range of other species including Trifolium repens. The southern area opens out under the power lines into a nice area of disturbed grassland. Potentilla anserina and Juncus inflexus are dominant, with Lotus uliginosus, Carex hirta, Alopecurus geniculatus, Gnaphalium uliginosum, J. effusus, J. bufonius, Holcus lanatus, Deschampsia caespitosa and a range of other species. A.III woodland occurs in S, where it is oak and tall hawthorn (old hedges), and also in centre of site, with oak, hornbeam and coppiced hazel.

Management: HCC CMS have carried out work at the site - mowing, hedge laying and coppicing. However, the site appears to be largely unmanaged. There has been some scrub clearance under power lines, presumably by the Electricity Board. There are many wheel ruts and much disturbed ground here. There is much dumping on the site. Mowing of selected areas of grassland at least once per year is essential, and scrub should be thinned. The ponds need some careful management.

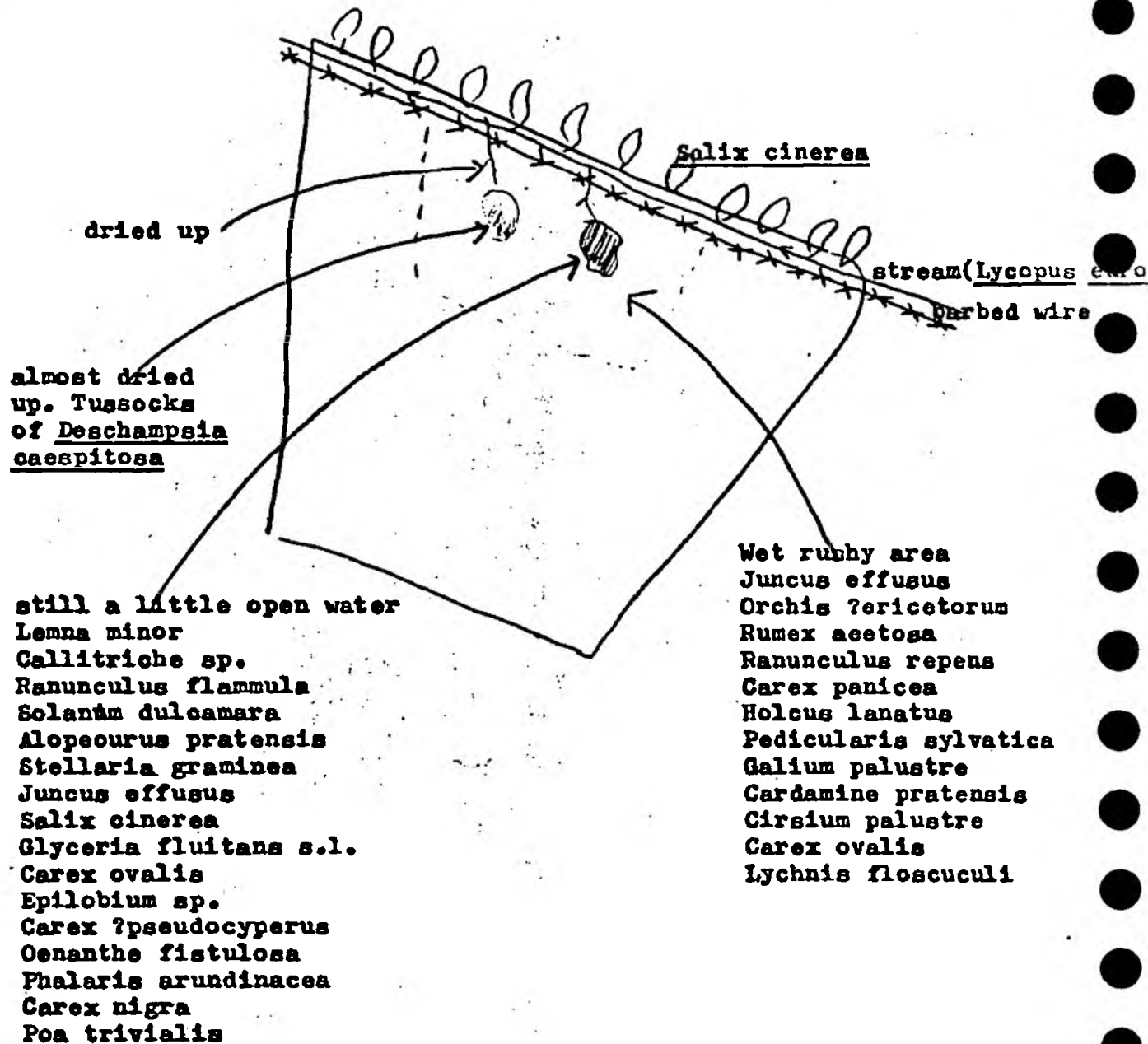
Burleigh Meadow 224228

Access from Langley by footpath.

A small (3 acre), mainly wet, field, with an interesting flora.

Holcus mollis locally dominant in drier parts

Genista anglica) present
G. tinctoria)



Some rabbit grazing. This field was ploughed during the war.

If the nearby SSSI boundary could be modified to take this in,

it would be good. It would also be good to let the farmer know

(as Dr Dony does) that we are interested. The site is too small to make a viable unit on its own

visited by Dony, Douglas
Newbold 1965

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Galium saxatile
Juncus biflorus

Lotus uliginosus
Mentha

Myosotis sylvatica
Quercus

Rumex acetosella
Rorippa nasturtium-aquaticum
Rubus
Veronica serpyllifolia
Veronica anensis

| COUNTY HERTFORDSHIRE | | | | | | | | | | NORTH HERTS. DISTRICT | | | | | | | | | | 1 | | 2 1/2" MAP No. | | T L 2 2 | | QUAD No. | | 7 | |
|----------------------|--|-----------------|--|----------------------|--|------------|--|-------------------|--|-----------------------|--|------------------|--|-------|--|--|--|--|--|---|--|----------------|--|---------|--|----------|--|---|--|
| Grid. Ref. | | 10 | | 16 | | 18 | | 19 | | 23 | | 25 | | 27 | | | | | | | | | | | | | | | |
| | | 2 2 5 2 2 8 | | Site No. 2 5 | | Month 6 | | Year 1 9 7 9 | | Veg. ht. (cms) | | No. spp. in quad | | River | | | | | | | | | | | | | | | |
| 1b Grazing Period | | 41 | | 51 | | 61 | | 71 | | | | | | | | | | | | | | | | | | | | | |
| | | Soil P mg/100g | | 52 lb N/annum | | 62 % Humus | | 72 Meadow Type | | | | | | | | | | | | | | | | | | | | | |
| 32 Breed of Cattle | | 42 | | 52 | | 62 | | 72 | | | | | | | | | | | | | | | | | | | | | |
| 33 | | 43 | | 53 | | 63 | | 73 | | | | | | | | | | | | | | | | | | | | | |
| | | Soil N % | | | | % Clay | | Hedge spp. | | | | | | | | | | | | | | | | | | | | | |
| 34 Breed of Sheep | | 44 | | 54 | | 64 | | 74 | | | | | | | | | | | | | | | | | | | | | |
| 35 | | 45 | | 55 lb P/annum | | 65 | | 75 | | | | | | | | | | | | | | | | | | | | | |
| | | Soil Mg mg/100g | | | | % Silica | | | | | | | | | | | | | | | | | | | | | | | |
| 36 Type of Stock | | 46 | | 56 | | 66 | | 76 | | | | | | | | | | | | | | | | | | | | | |
| 37 | | 47 | | 57 | | 67 | | 77 | | | | | | | | | | | | | | | | | | | | | |
| | | Soil K mg/100g | | 58 lb K/annum | | 68 pH | | 78 OTHER INTEREST | | | | | | | | | | | | | | | | | | | | | |
| 38 OTHER GRAZING | | 48 | | 58 | | 68 | | 78 | | | | | | | | | | | | | | | | | | | | | |
| 39 Cutting | | 49 | | 59 | | 69 | | 79 | | | | | | | | | | | | | | | | | | | | | |
| | | Soil Ca % | | 60 OTHER FERTILISERS | | GEOLOGY | | 80 CARD 1 | | | | | | | | | | | | | | | | | | | | | |
| 40 Spraying | | 50 | | 70 | | | | | | | | | | | | | | | | | | | | | | | | | |

NOTES

Archaeological features: none apparent

Geology - Glacial gravel - overlying chalk

Soil type: chyloran p. H 6.5

Water found: ponds and marshes on back lands within 1/2 field

perhaps something from young / static first year (60)

Management: Mosaic grazed *Eragrostis* sward in field of fine

[Illegible signature]

[illegible]

Adjacent land use: woodlands, scrub, A.J. 1980

Scrub in western Michigan

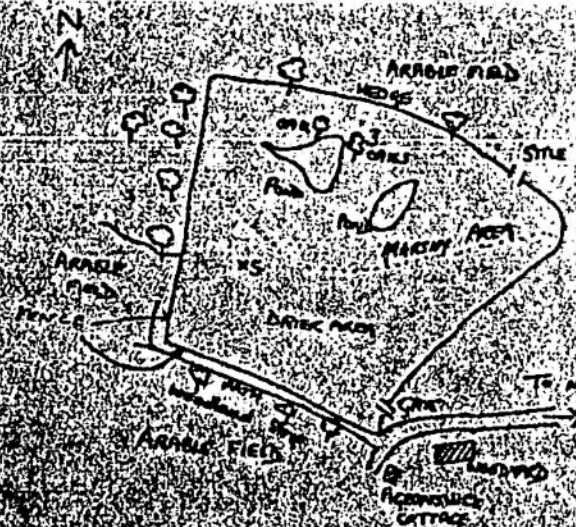
Kennedy's

As the number of people in the world grows, the need for more food and resources grows. The world's population is growing at a rapid rate, and the demand for food and resources is increasing. The world's population is growing at a rapid rate, and the demand for food and resources is increasing.

THE UNIVERSITY OF CHICAGO

100-443887-100

Additional notes: *Reared along roadside, but displaced pollinators in damp areas*
the same species



Knebworth Woods: report on Biological conservation and management.

The major part of Newton Wood (including Cannocks Wood, Cowley's Corner Wood, and Burleigh Grove) consists of ancient woodland. The predominant woodland type is oak (*Q. robur*) and hornbeam, although this has been much modified by management activities. It would seem that much of the central and southern part of the wood were very open, heathy ground c. 1780, later planted with oaks, and that former oak/hornbeam coppice in the rest of the central area was converted to high forest at the same time. Burleigh Grove, Parsons Grove and part of Cannocks Wood were managed as coppice later. One area at the west end of Burleigh Grove appears to have been planted as oak/hornbeam coppice between 1780 and 1839.

Cowleys Corner Wood, the Firs Plantation and a planted former pasture at Pigeonswick are mostly mixed conifer (mainly larch) and deciduous plantations. Cowleys Corner Wood contains some large remnant oaks of little significance.

Map 1: Areas of special biological importance

Woodland areas

- a) Pigeonswick Wood (No. 1 on map) Important as a shelter for the rich pasture of Burleigh Meadow (of which it is a planted-up part), and for its resident Nightingales.
- b) Newton Wood (NW. sector) (No. 2). Important and best area of oak/hornbeam woodland on damper soils. Has a good age structure, with some old oaks, and a good ground flora of ferns, bryophytes etc.
- c) Newton Wood (SE sector) (No. 4). The best area of oak/hornbeam woodland on drier soils. Has a reasonable age structure, limited heathy ground flora. Has some dead timber, and is known to be important for some insects, notably Lepidoptera.
- d) Newton Wood (NW sector) and Cannocks Wood. A representative area of the damp oak/birch type of woodland which is probably a product of decay or removal of hornbeam and/or oak on damper soils. Has a good ground flora of ferns, bryophytes and rushes in places. (No. 4 on map).

Rides

- a) Central crossing area. (No. 5 on map) An important damp heath flora, with some rare species (e.g. *Carex binervis*), and a good stand of *Succisa pratensis*, the food plant of the Marsh Fritillary butterfly, recorded from near here in earlier years. Otherwise good for insects in general.
- b) Northern rides (Nos 6 & 7) Good damp heathy flora, with local plants. The presence of aspen is an important feature, especially for insects, including several rare beetles.
- c) Damp cross ride (No. 10) Good damp/marshy flora, and also important for insects. Has the only sizeable population of willow in the wood, the food plant of the Purple Emperor butterfly, recorded in the past from near

- a) Open heathy ride between mature oak woodland. Has a reasonable flora and is important for insects, particularly butterflies. (No. 9)
- b) Overgrown heathy ride. Has important flora, including Heath Milkwort. Important for insects, including Syrphid flies and Lepidoptera etc. (No. 8)
- c) Dry sandy ride with reasonably interesting heathy flora and insects. Is known to have been the site of the Pearl-bordered Fritillary butterfly.

Other features of woodland management (lettered on map)

- A) Old stubbed oak. An ancient boundary marker.
- B) Old elm/hornbeam layered hedge.
- C) Two old wych elms, former markers of the wood edge. (now diseased).
- D) Ancient cherry tree (*P. avium*) (another recently fallen.)
- E) Old pollarded hornbeam.
- F) Two old pollarded hornbeams.

Map 2: Management recommendations

The following recommendations are based on an attempt to conserve the main woodland features, notably the original oak/hornbeam woodland, which is of a type unique in north Hertfordshire and uncommon in Herts. generally. The oak/birch woodland, which has varying amounts of hornbeam and/or hazel is regarded as of less importance, partly because of its more closed community, but also because it is probably derived from degenerate oak/hornbeam woodland or coppice. For this reason, the main areas recommended for retention are those on the oak/hornbeam woodland areas. Sections predominantly oak/hornbeam coppice have not been selected on account of their lesser interest for ground flora in their present over-mature state.

Special woodland areas

Compartment 2 This should preferably be maintained to protect Burleigh Meadow. A coppice regime would be especially beneficial, especially considering the area's importance for the Nightingale.

Compartment 7 The shaded area corresponds to most of the interesting area of oak/hornbeam woodland on damper soils. This should be managed as at present: selected felling of oaks as necessary, and replacement of oak standards. Birch invasion in clearings needs checking, if it becomes excessive.

Compartment 10 The shaded area covers most of the oak/hornbeam on drier soils. This should be managed as at present, with occasional felling of trees as necessary, and replacement. Some dead timber should be allowed to remain.

General Forestry Management

Order to minimise the effects of felling, especially on the invertebrate and vertebrate populations, it is recommended that at least 20 m. strips of original coppice should be left between each planted belt and along open woodland margins. These strips at present hold dense hornbeam (remains of coppice), some of this could profitably be thinned out. (e.g. in Compartment 13 and the S. end of Comp. 8)

Such strips could be arranged in Compartment 4 so as to protect some of the alder communities, this would be useful. A section of hornbeam coppice could be retained at the E. end of this compartment so as to act as a buffer against open field. Similarly for the NW end of Compartment 5.

Rides

It is very important that 20 m. strips be maintained alongside all the main rides, thus helping to maintain the character of the wood, and also retain continuous natural woodland throughout the complex.

The rides include most of the botanically important habitats. The ride between compartments 10 and 12 needs clearing of most of its bracken, and the birch, horn and willow bushes trimmed back, in order to conserve the open heathy flora.

As the central crossing area is botanically and entomologically important, it should be as undisturbed as possible, but kept free from bracken.

The rest of the rides should be maintained as at present, ensuring that aspen does not encroach too much in rides 7/8 and 8/11. The willow in ride 8/10 will similarly need checking occasionally, but care should be taken to leave at least some of this standing. It is suggested that in general the rides should be used half at a time, leaving the other half for a few years.

The control of weed species, especially bracken, should preferably be undertaken manually if at all possible. The use of non-selective weedkillers should be avoided.

In areas of less importance biologically, such as Compartments 3, 6, 11 and 12, there is no need for special control over management activities beyond perhaps the leaving of an "amenity fringe". However, the use of weed-killers in these areas should preferably be avoided in favour of mechanical weeding.

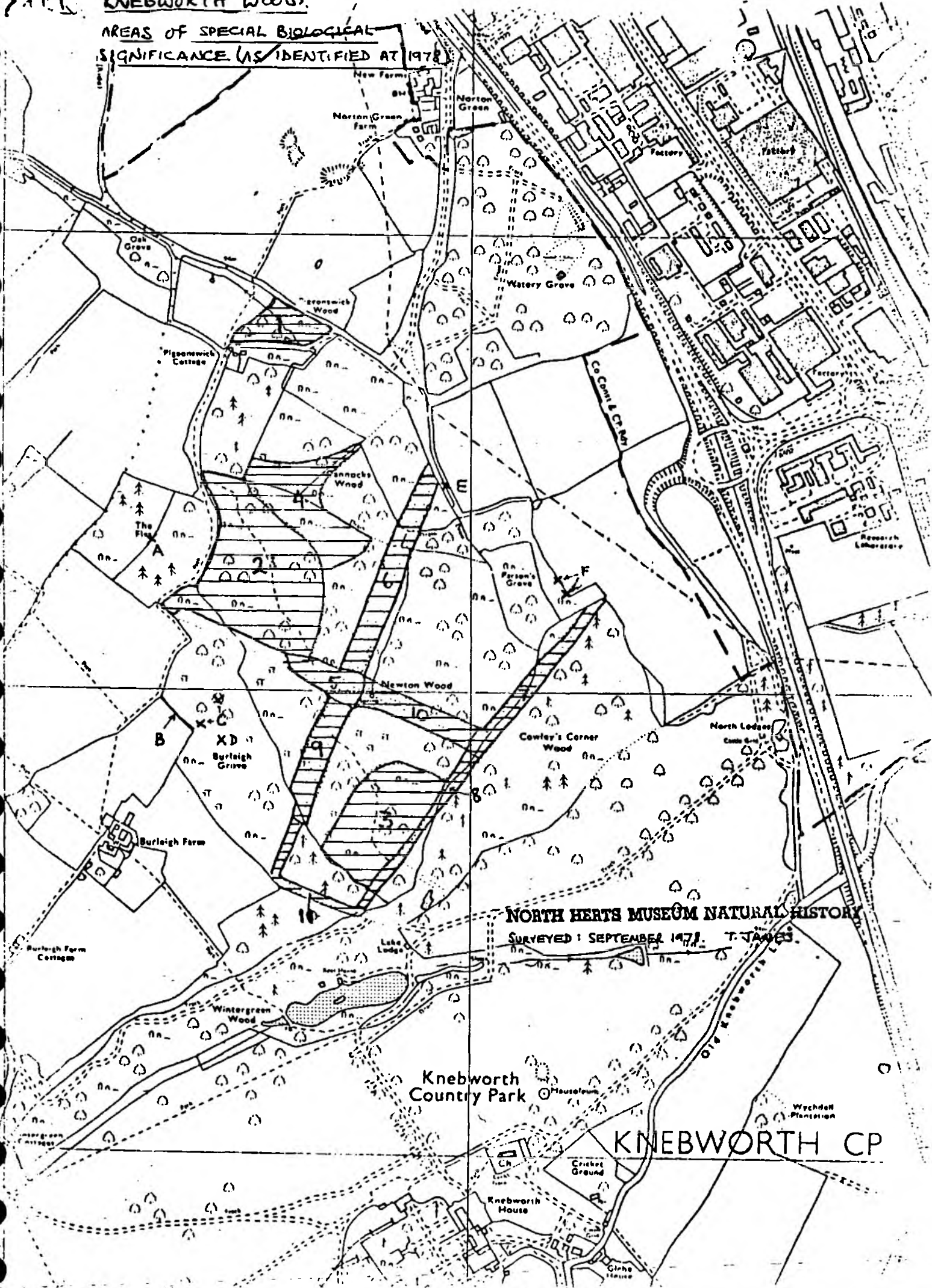
The need for further investigation

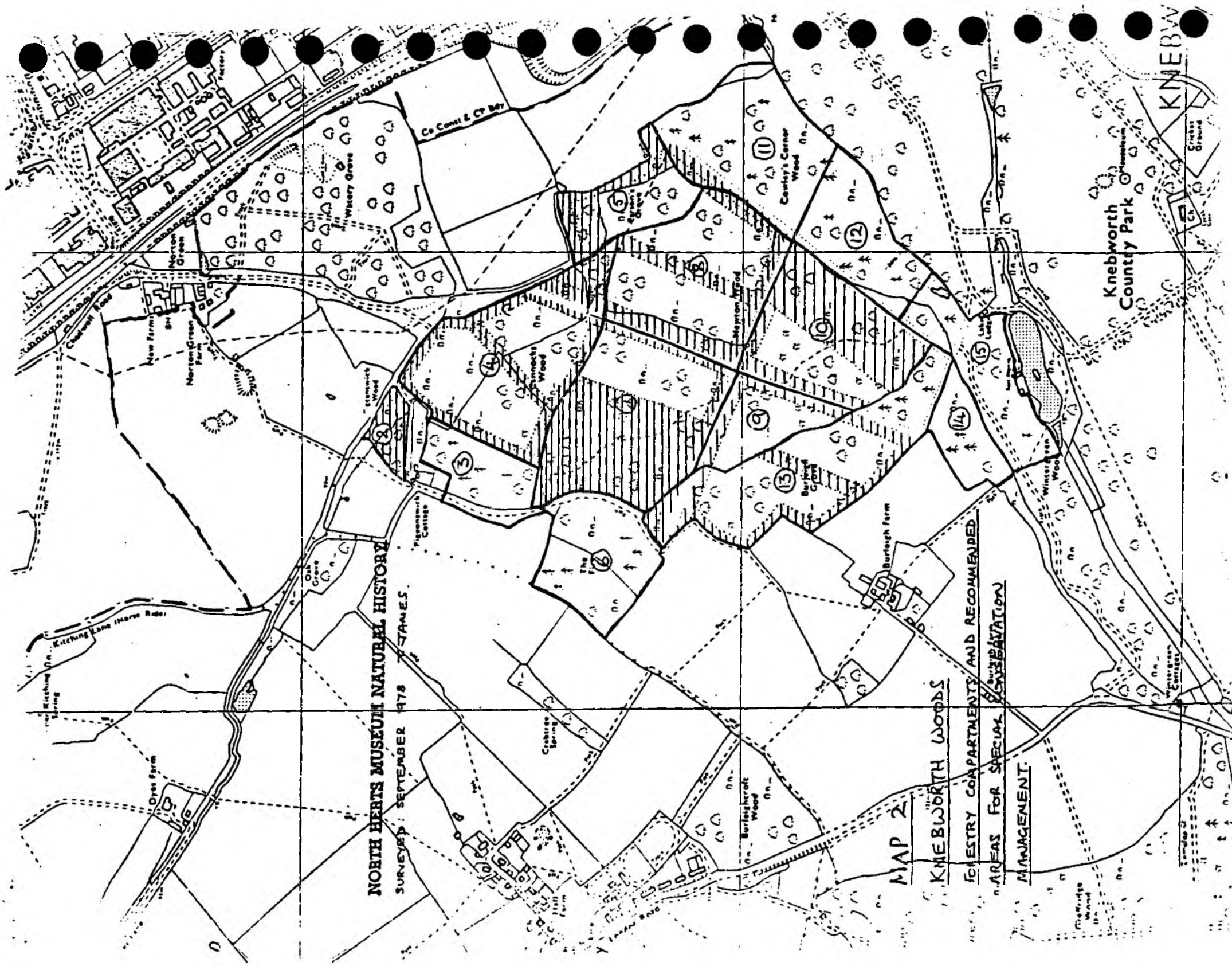
Certain areas of the woods need complete surveys, notably Wintergreen Wood and the adjacent area of Newton Wood, as well as Graffridge Wood, outside the S.S.I. Further studies over the whole wood need to be made especially for breeding birds, mammals and insects. More up-to-date information regarding Lepidoptera and Coleoptera is required. Groups such as Spiders and bryophytes are equally lacking in data.

21st September 1978.

T. J. James
Keeper of Natural History
North Hertfordshire Museum

AREAS OF SPECIAL BIOLOGICAL
SIGNIFICANCE (AS IDENTIFIED AT 1978)





KNEBWORTH WOODS. **Key to woodland habitats.**

OAK.
(Probably planted, with occasional birch, hornbeam)

OAK/HORNBEAM
(No coppice, often open canopy, dry-damp soils, occasional birch etc.)

i) Open, recent coppice.
OAK/HORNBEAM COPPICE
ii) Closed, ancient coppice.

OAK/BIRCH
(usually with some hornbeam or hazel, the latter on damper soils).

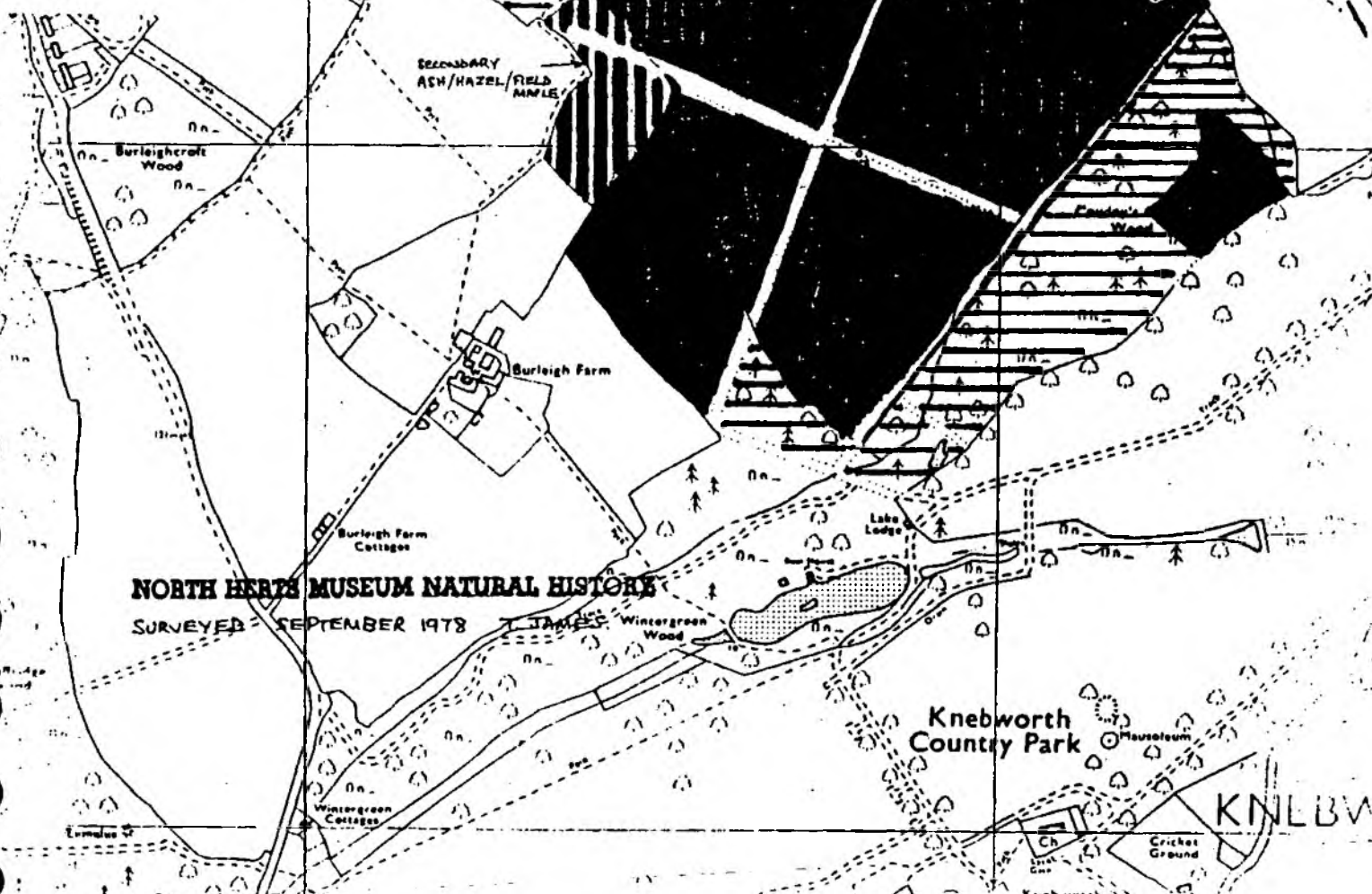
BIRCH
(wetter areas and rides. Some oak).

BIRCH/ASPEN
(Scrub on felled oak/birch. Some hornbeam in parts).

ASPEN
(A feature of the main rides only).

MIXED PLANTATIONS.
(Varying age. Some old oaks. Mostly larch.).

CONIFER PLANTATION
(Spruce, fir only).



NORTH HERTS MUSEUM NATURAL HISTORY

SURVEYED SEPTEMBER 1978

J. JAMES

Knebworth Country Park

KNLBV