

## **Priority Habitat Definition Statement Mesotrophic Lakes – v1.2**

### **1. Introduction**

#### **1.1 General description**

**Mesotrophic lakes are bodies of standing water characterised by having a narrow range of nutrients and are in the middle of the trophic range (with a pH usually around or slightly below neutral). Planktonic algae sometimes discolour the water. May be natural lakes or artificial water bodies such as gravel pits and reservoirs, but not canals or ditches.**

**Standing waters are usually classified according to their nutrient status. There are three main types of standing waters: oligotrophic (nutrient-poor), eutrophic (nutrient-rich) and mesotrophic (intermediate). Other types of standing water include dystrophic (highly acidic, peat-stained water), guantrophic, marl lakes, brackish water lakes, turloughs and other temporary water bodies.**

#### **1.2 Summary of existing information**

Definitions for mesotrophic lakes have been taken from:

- JNCC – Handbook for Phase 1 habitat survey, 1993
- Biodiversity: The UK Steering Group Report, Tranche 1: Volume 2 (Action Plans): p265
- EUNIS habitat classification (including CORINE, Palaeartic etc)
- JNCC Report No. 317: An estimate of the extent of dystrophic, oligotrophic, mesotrophic and eutrophic standing fresh water in Great Britain, MA Palmer & DB Roy, April 2001.

A full list of information sources is attached as **Appendix 1**.

#### **1.3 Key issues with mapping and discriminating from other habitats.**

- There may be problems with mapping this habitat, as at present the extent of standing water in the UK is only an estimate, and this estimate has been made from existing survey data covering 3500 water bodies mostly in Scotland. The data is more patchy for England and Wales and therefore there is a large capacity for error in the estimates.
- This habitat also has considerable overlap with other standing water habitats. (Ref: JNCC Report No. 317: An estimate of the extent of dystrophic, oligotrophic, mesotrophic and eutrophic standing fresh water in Great Britain, MA Palmer & DB Roy, April 2001).
- The Environment Agency has data concerning threshold values for mapping mesotrophic lakes.
- Please refer to Section 9 for instructions on dealing with relationships with other habitats, and Section 11 for size of mappable units.
- Areas of semi-natural or artificial habitat totally within an area of this priority habitat should be included in the polygon for this priority habitat polygon, if <0.25ha.

## **2. Physio-graphical description**

### **2.1 Structural/physical components**

Mesotrophic lakes are relatively infrequent in the UK and are largely confined to the margins of upland areas in the north and west. Mesotrophic lakes generally have nutrient levels of  $0.3\text{-}0.65\text{mgNI}^{-1}$  and  $0.01\text{-}0.03\text{mgPI}^{-1}$  and are characterised by having a narrow range of nutrients, the main ones being inorganic nitrogen (N) and total phosphorus (P).

### **2.2 Applicability of aerial photos and other remote sensing technologies**

Aerial photography and Landline data are certainly applicable for identifying water bodies but mesotrophic lakes could be easily confused with other standing water bodies, therefore, ground-truthing would be necessary to measure nutrient levels and establish trophic status.

## **3. Altitudinal limits**

This habitat occurs in mainly upland areas (above 300m), eg Scotland and the Lake District.

## 4. Habitat classification

CLASSIFICATION and version date	CODE	DESCRIPTION	RELATIONSHIP*	COMMENTS
BAP priority habitat (1995)		Mesotrophic lakes		
BAP broad habitat (1998)	13	Standing open water and canals	>	
Phase 1 (1990)	G12	Standing water : mesotrophic	=	Unsure as to whether this is exactly corresponding.
IHS (2000)	AS3	Mesotrophic standing waters	=	
NVC	A2, A3, A4, A8, A9, A11, A13, A19, A20,	Aquatic communities only are mentioned here, and only those that specifically mention mesotrophic water bodies in the habitat section.		A2, A3, A11, A19, A20 can also occur in eutrophic lakes. Others to be included?
EUNIS	C1.2	Permanent mesotrophic lakes, ponds and pools	?	Unsure as to exact corresponding habitats
Palaeartic	22.12	Mesotrophic water bodies	?	Unsure as to exact corresponding habitats
CORINE (1991)	5.1.2	Water bodies	>	Unsure as to exact corresponding habitats
Habitats Directive Annex 1 (later version)	3130 3140	Oligotrophic to mesotrophic standing waters with veg... Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp.	? ?	Unsure as to exact corresponding habitats

\* relationship of classification type to priority habitat:  
= equal, < narrower, > wider, # overlap, ? not determined

## 5. Species composition

### 5.1 Flora

Mesotrophic lakes have the highest macrophyte diversity of any lake type and relative to other lake types they contain a higher proportion of nationally scarce and rare aquatic plants eg Blunt-leaved pondweed *Potamogeton gramineus*, Perfoliate pondweed *Potamogeton perfoliatus*, Yellow water lily *Nuphar lutea* and White water lily *Nymphaea alba*.

### 5.2 Fauna

Macroinvertebrates are well represented in this habitat, with particularly important groups being dragonflies, water beetles, stoneflies and mayflies. Other species well represented in mesotrophic lakes include the rare fish *Coregonus albula* (Vendace) and *Coregonus lavaretus* (Schelly). In general fish communities in mesotrophic lakes are a mix of coarse and salmonid species, but today there are few truly natural assemblages due to introduced species.

Please see **Appendix 2** for a full list of priority species associated with this habitat (from Biodiversity – Making the links, English Nature Biodiversity series).

## 6. Geographical restrictions

### 6.1 Geographical coverage and restrictions in the UK

Mesotrophic lakes are relatively infrequent in the UK and largely confined to the margins of upland areas in the north and west. It is estimated that there is 26,727 ha of mesotrophic standing water in Great Britain with the majority of it being in Scotland (approx. 17,983 ha).

### 6.2 Climate requirements

Information not found.

## 7. Geology and soils

May have a relationship with acidic soils – free draining mineral soils, acid brown earths and peat bogs. Not all sites are natural lakes, some may be artificial waters and so may have no relationship with geology and soil structure (no information available).

## 8. Hydrology

The main indicative nutrients in mesotrophic standing waters are nitrogen (N) and total phosphorous (P). Typically these water bodies have nutrient levels of 0.3 – 0.65 mgNI<sup>-1</sup> and 0.01 – 0.03 mgNI<sup>-1</sup>, however, virtually all available nutrients are 'locked up' in algae during the growing season. **The pH in these water bodies is usually around or slightly below 7 (neutral) although it can be higher.**

## 9. Relationship with other habitats

	<b>Mesotrophic lakes</b>
<b>Eutrophic standing waters</b>	Separate by water chemistry and/or aquatic plant communities.
<b>Fens</b>	Fen fringes to water bodies are mapped as part of the water body if less than 5 metres in width (see broad habitat definition). Use standard polygon and MMU rules.
<b>Reedbeds</b>	Reed fringes to water bodies are mapped as part of the water body if less than 5 metres in width (see broad habitat definition). Use standard polygon and MMU rules.

(Mesotrophic lakes can also be related to oligotrophic standing waters, as large areas of standing water can have both oligotrophic and mesotrophic parts to them (eg. Loch Lomond is described as oligotrophic at the northern end and mesotrophic at the southern end)).

## **10. Management**

Management of mesotrophic lakes is largely in the form of action to rehabilitate nutrient enriched lakes as a result of pollution etc. and to monitor water quality. They are used widely for recreational purposes and some for water extraction.

## **11. Size of mappable units**

### **Minimum mappable unit (MMU): 0.1 ha**

This is the suggested minimum mappable area for water bodies under the IHS mapping rules. Those water bodies less than 0.1 ha (10m x 10m) should be mapped as a point reference.

## **12. Regional differences**

(No info available)

## **Appendix 1**

### **Information Sources**

English Nature (1999) Biodiversity : making the links. English Nature

Jackson, D.L. (2000). Guidance on the interpretation of the Biodiversity Broad Habitat Classification (terrestrial and freshwater types): Definitions and the relationship with other habitat classifications. JNCC Report, No. 307.

NCC (1990). Handbook for Phase 1 habitat survey: a technique for environmental audit field manual NCC, Peterborough

## Appendix 2

### BAP priority species associated with mesotrophic lakes

(From "Biodiversity - Making the Links" - 28 June 2000 version)

Scientific name	Common name	Taxon	Priority list	Importance of habitat to the species *
<i>Bufo calamita</i>	Natterjack toad	Amphibian	SAP	P
<i>Chara connivens</i>	Convergent stonewort	Stonewort	SAP	P
<i>Chara curta</i>	Lesser bearded stonewort	Stonewort	SAP	P
<i>Chara muscosa</i>	Mossy stonewort	Stonewort	SAP	P
<i>Coregonus albula</i>	Vendace	Fish	SAP	P
<i>Najas flexilis</i>	Slender naiad	Vascular plant	SAP	P
<i>Nitellopsis obtusa</i>	Starry stonewort	Stonewort	SAP	P
<i>Pilularia globulifera</i>	Pillwort	Vascular plant	SAP	P
<i>Tolypella intricata</i>	Tassel stonewort	Stonewort	SAP	P
<i>Tolypella prolifera</i>	Great tassel stonewort	Stonewort	SAP	P
<i>Potamogeton rutilus</i>	Shetland pondweed	Vascular plant	SAP	P?
<i>Badister peltatus</i>	a ground beetle	Beetle	SS	S
<i>Chara baltica</i>	Baltic stonewort	Stonewort	SS	S
<i>Hirudo medicinalis</i>	Medicinal leech	Worm	SAP	S
<i>Luronium natans</i>	Floating water-plantain	Vascular plant	SAP	S
<i>Melanitta nigra</i>	Common scoter	Bird	SAP	S
<i>Nitella tenuissima</i>	Dwarf stonewort	Stonewort	SAP	S
<i>Pipistrellus pipistrellus</i>	Pipistrelle bat	Mammal	SAP	S
<i>Potamogeton compressus</i>	Grass-wrack pondweed	Vascular plant	SAP	S
<i>Segmentina nitida</i>	Shining ram's-horn snail	Mollusc	SAP	S
<i>Weissia rostellata</i>	Beaked beardless-moss	Moss	SAP	S
<i>Weissia squarrosa</i>	Spreading-leaved beardless-moss	Moss	SS	S
<i>Arvicola terrestris</i>	Water vole	Mammal	SAP	x
<i>Barbastella barbastellus</i>	Barbastelle bat	Mammal	SAP	x
<i>Collema dichotomum</i>	River jelly lichen	Lichen	SAP	x
<i>Donacia aquatica</i>	a reed beetle	Beetle	SAP	x
<i>Donacia bicolora</i>	a reed beetle	Beetle	SAP	x
<i>Lophopus crystallinus</i>	a freshwater bryozoan	Bryozoa	SAP	x
<i>Lutra lutra</i>	Otter	Mammal	SAP	x
<i>Micromitrium tenerum</i>	Millimetre moss	Moss	SS	x
<i>Myxas glutinosa</i>	Glutinous snail	Mollusc	SAP	x
<i>Triturus cristatus</i>	Great crested newt	Amphibian	SAP	x

\* (P) primary, (S) secondary or (x) less