APPENDIX 1. MAPS

APPENDIX 1. MAPS

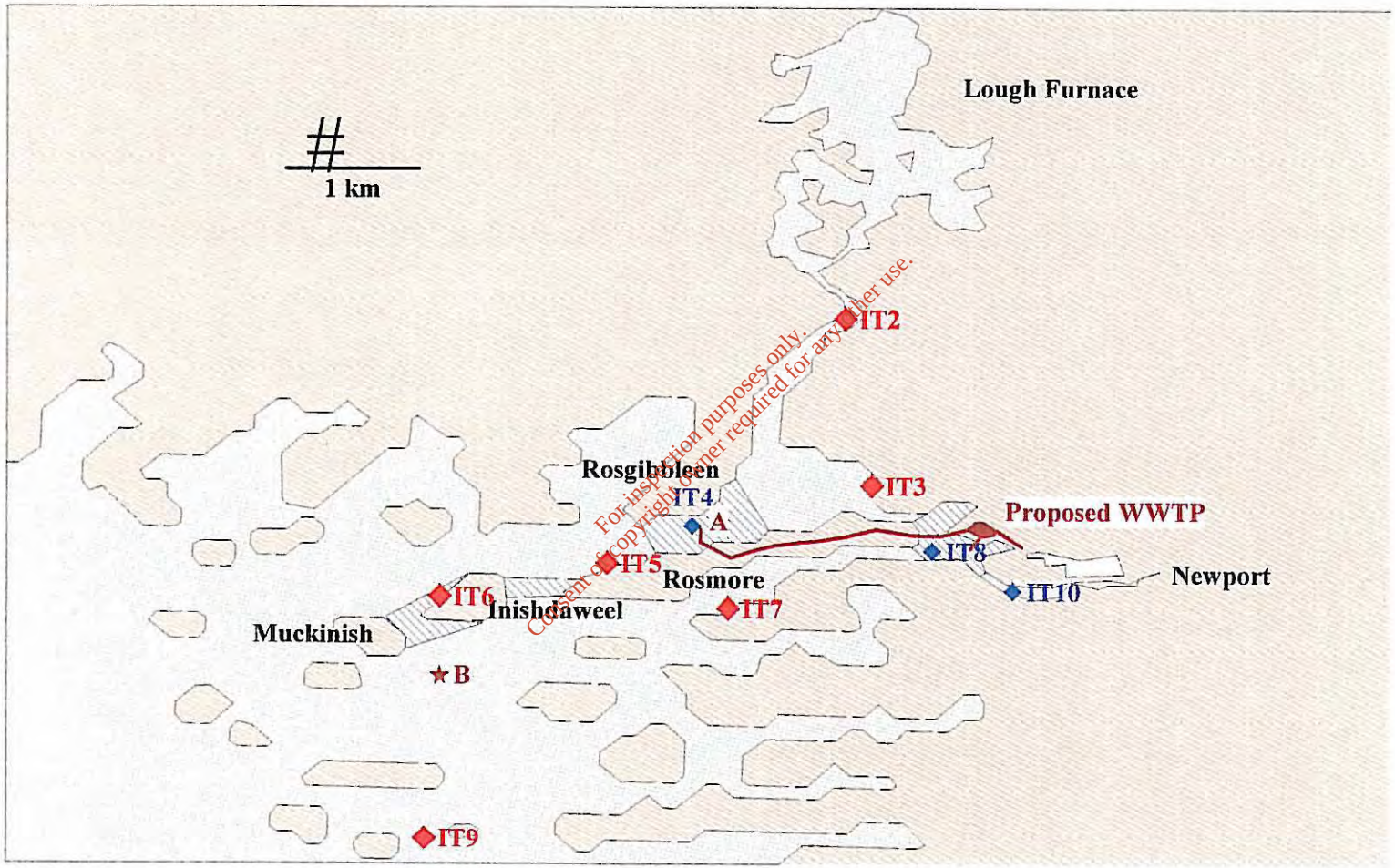

Figure 1.1. Locations of littoral biotope surveys (blue hatched areas) and sites where littoral algae and mussels were collected (IT2 – IT10). The reduced analytical suite was conducted on those sites in red (IT2, IT3, IT5 – IT7, IT9) and the full suite was conducted on those sites in blue (IT4, IT8 and IT10). The proposed WWTP is shown in brown with the outfall at A and the proposed alternative outfall site is indicated by B.

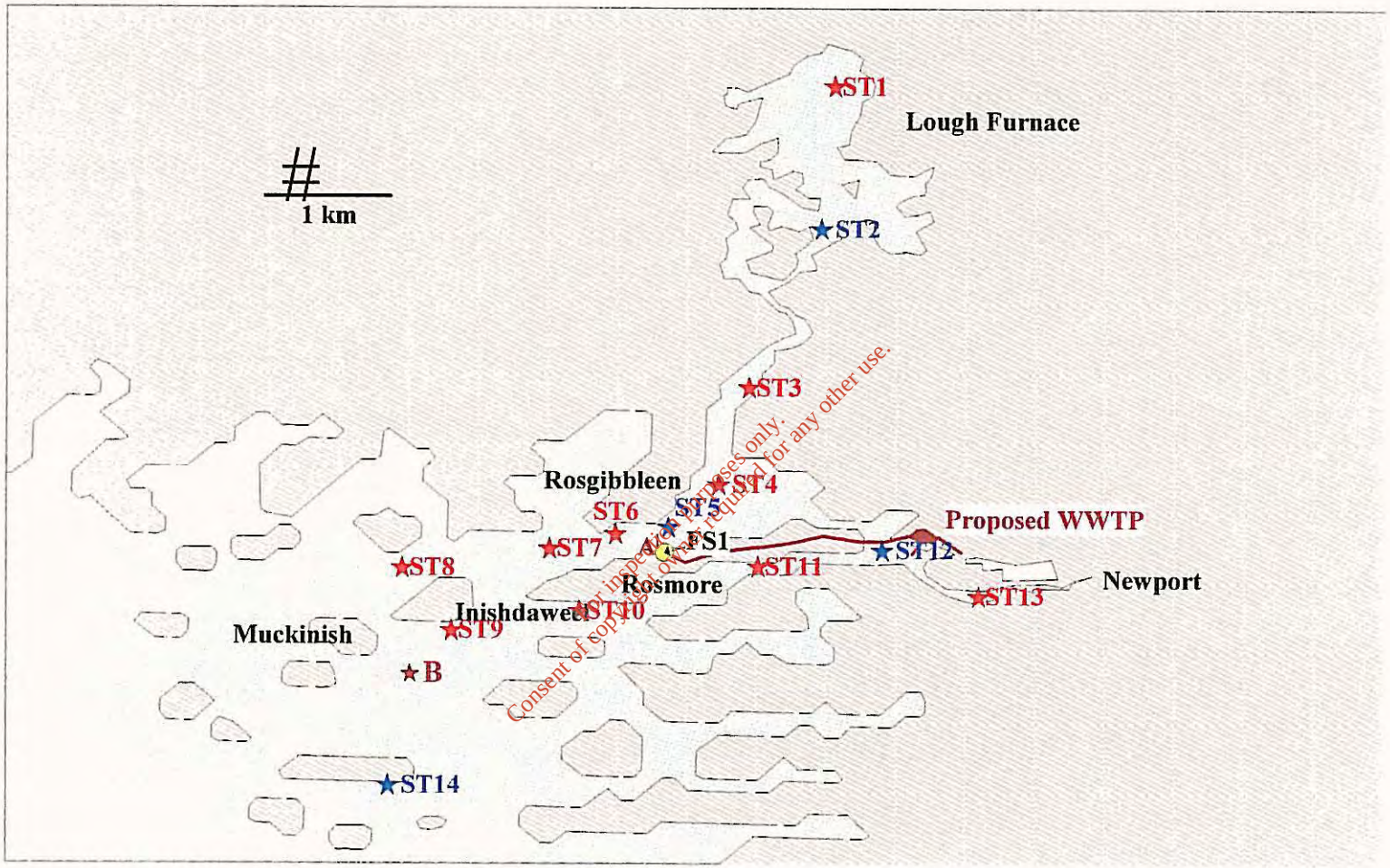

Figure 1.2. Locations of sublittoral surveys (ST1 – ST14). The reduced analytical suite was conducted on those sites in red (ST1, ST3, ST4, ST6 – ST11 and ST13) and the full suite was conducted on those sites in blue (ST2, ST5, ST12 and ST14). The fish survey is indicated by a yellow circle at the location of the proposed outfall (FS1). The proposed WWTP is shown in brown with the outfall at A and the proposed alternative outfall site is indicated by B.

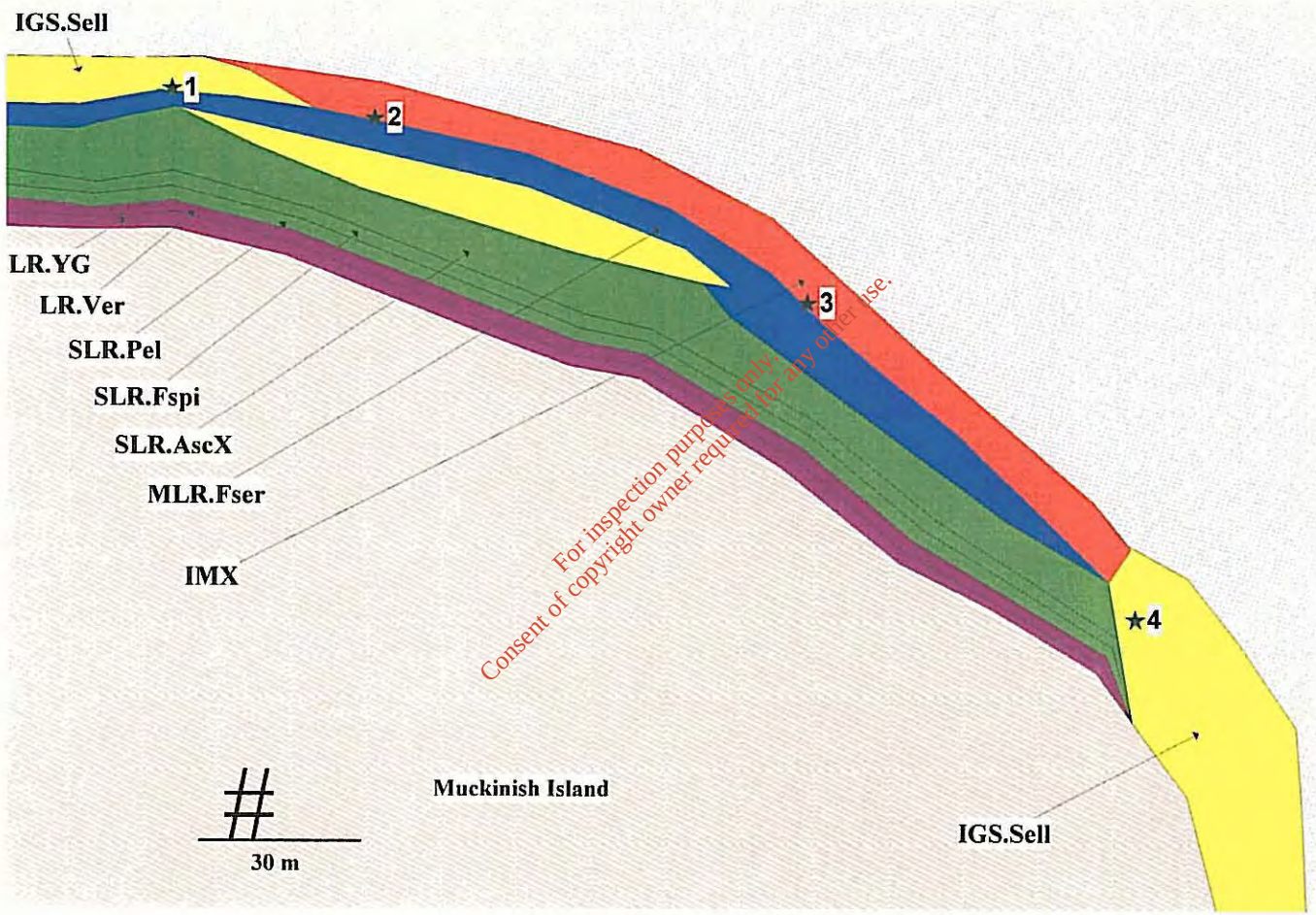

Figure 1.3. Map showing the biotopes of the eastern shore of Muckinish Island. Colours indicate the higher biotope codes (Appendix 10).

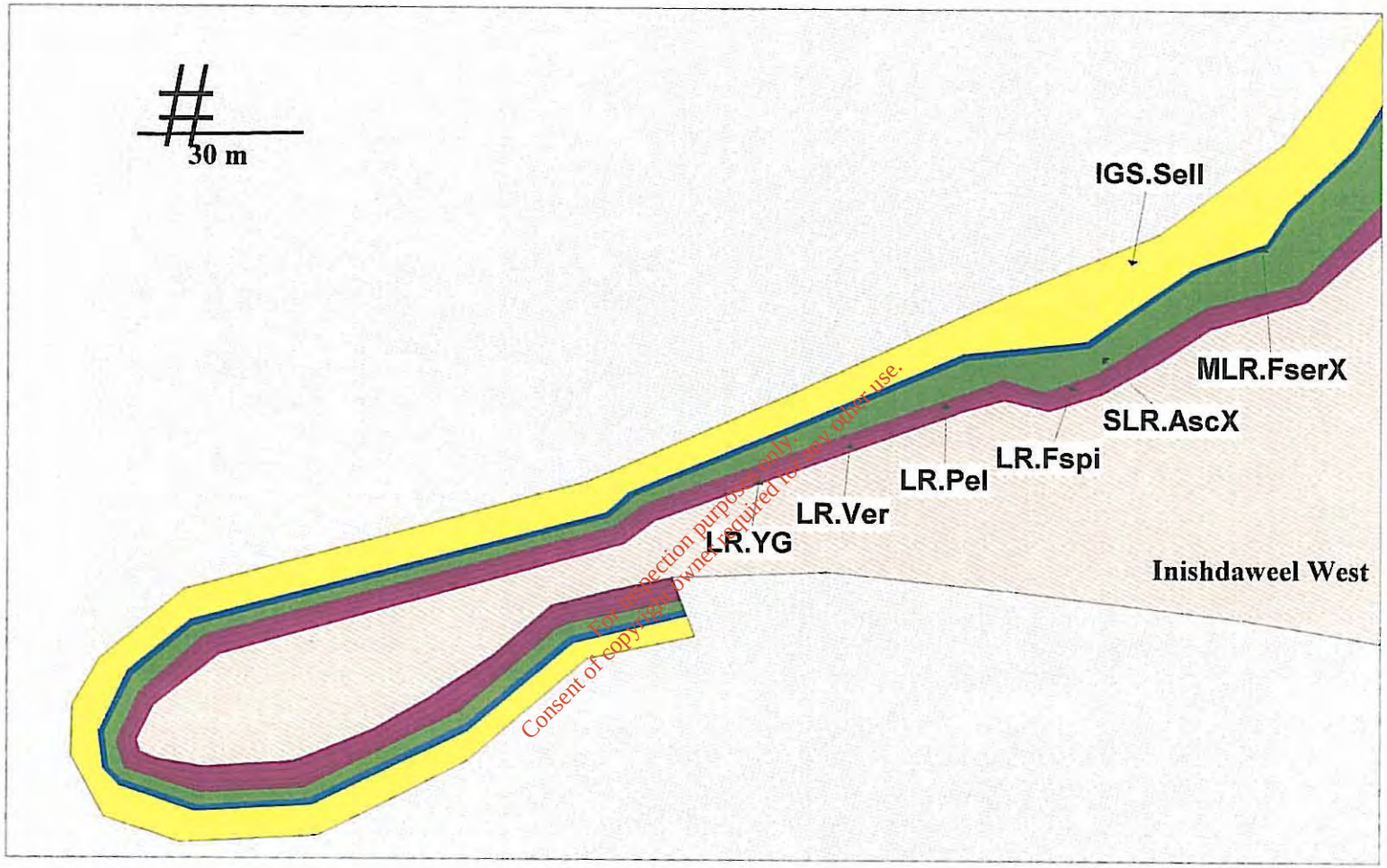

Figure 1.4. Map showing the biotopes of the western shore of Inishdaweel Island. Colours indicate the higher biotope codes (Appendix 10).

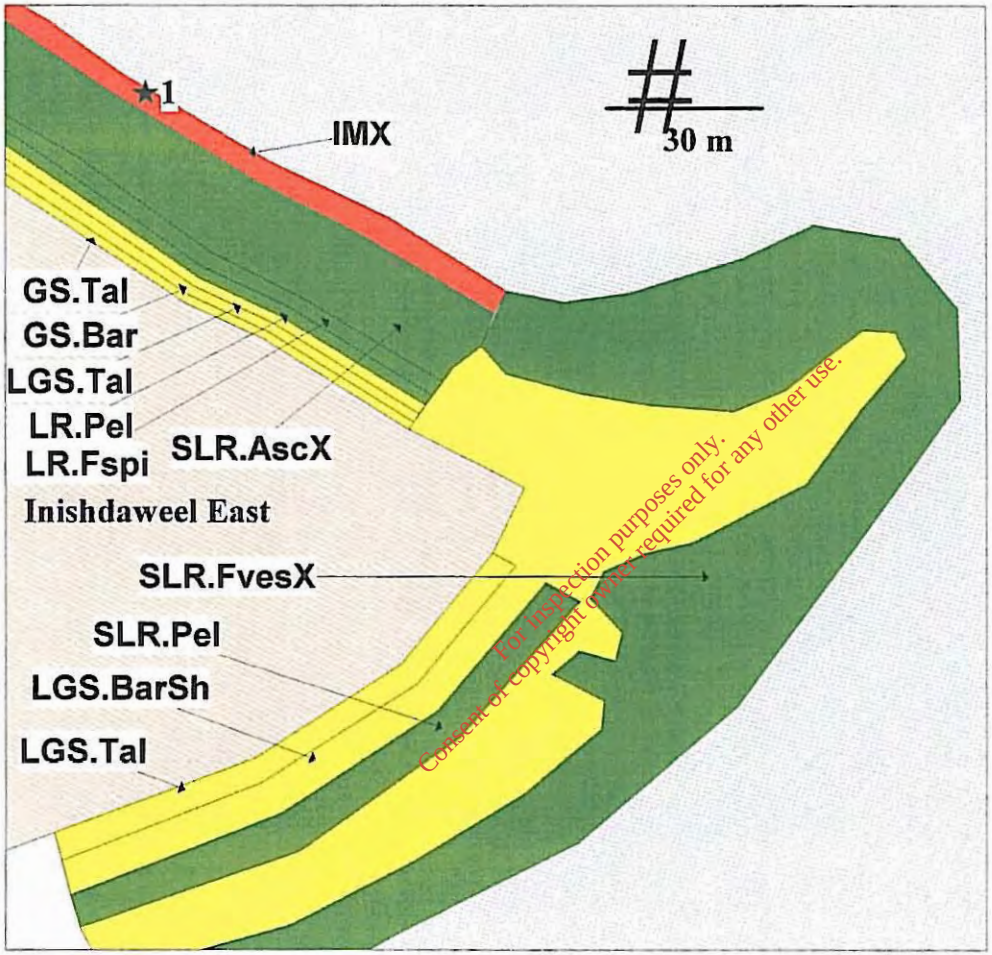

Figure 1.5. Map showing the biotopes of the eastern shore of Inishdaweel Island. Colours indicate the higher biotope codes (Appendix 10).

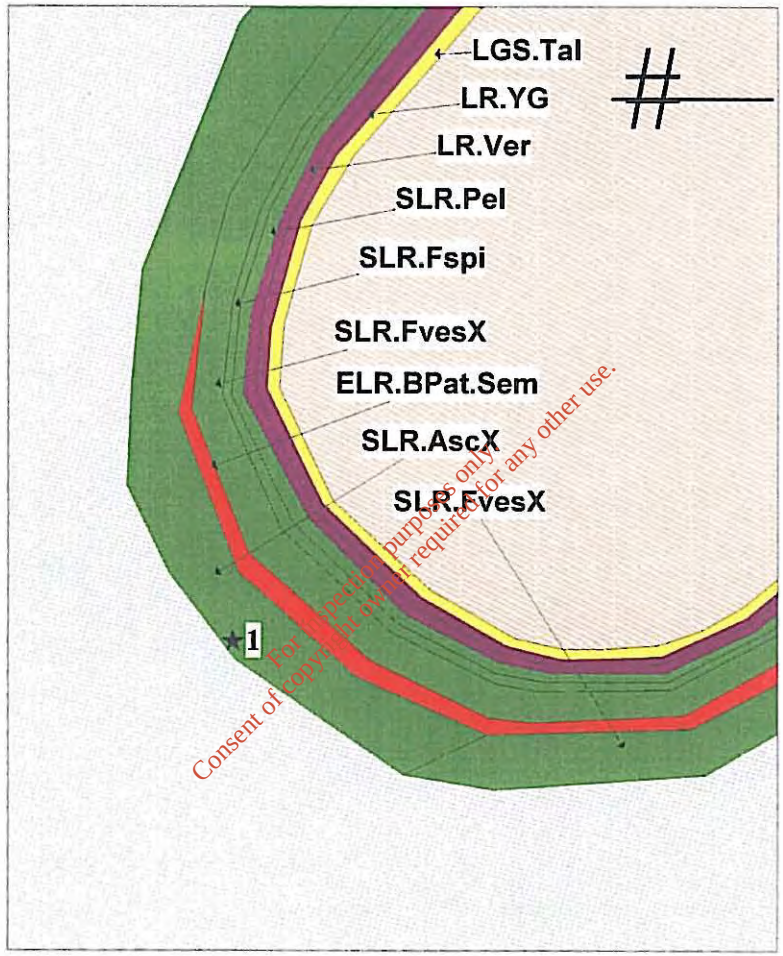

Figure 1.6. Map showing the biotopes of the eastern shore of Rosmore Point. Colours indicate the higher biotope codes (Appendix 10).

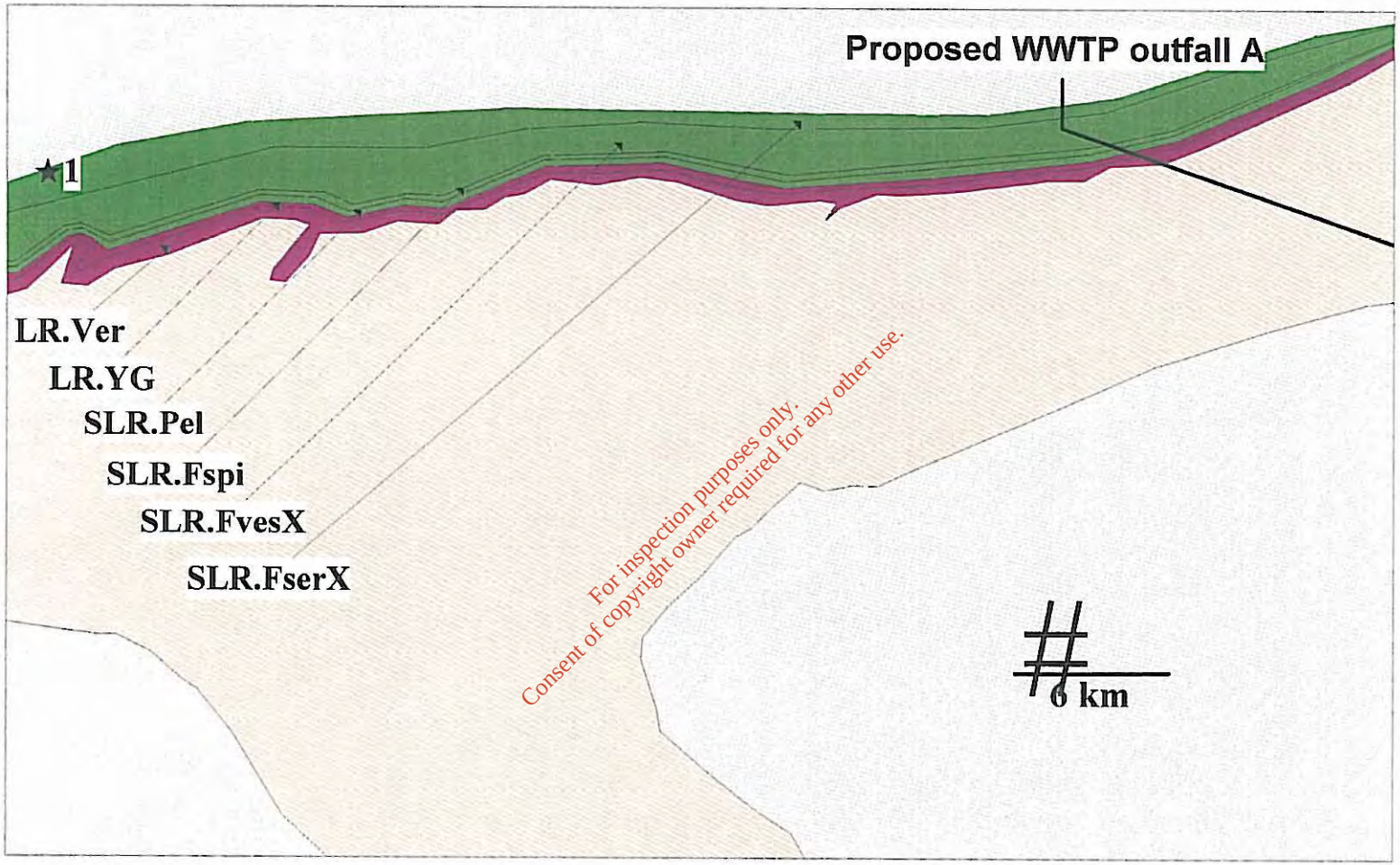

Figure 1.7. Map showing the biotopes of the northern shore of Rosmore Island. Colours indicate the higher biotope codes (Appendix 10).

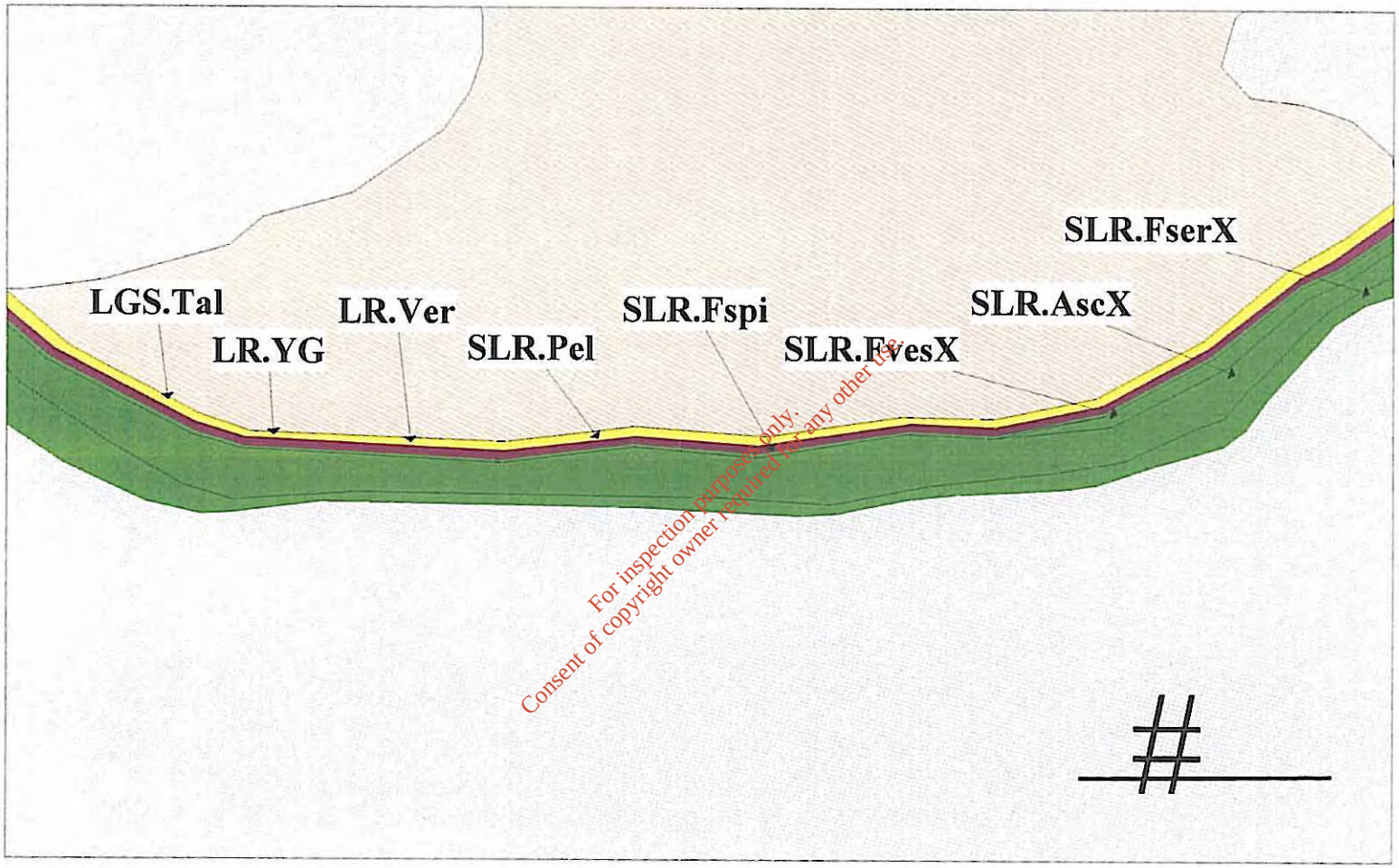

Figure 1.8. Map showing the biotopes of the eastern shore of Rosgibbileen. Colours indicate the higher biotope codes (Appendix 10).

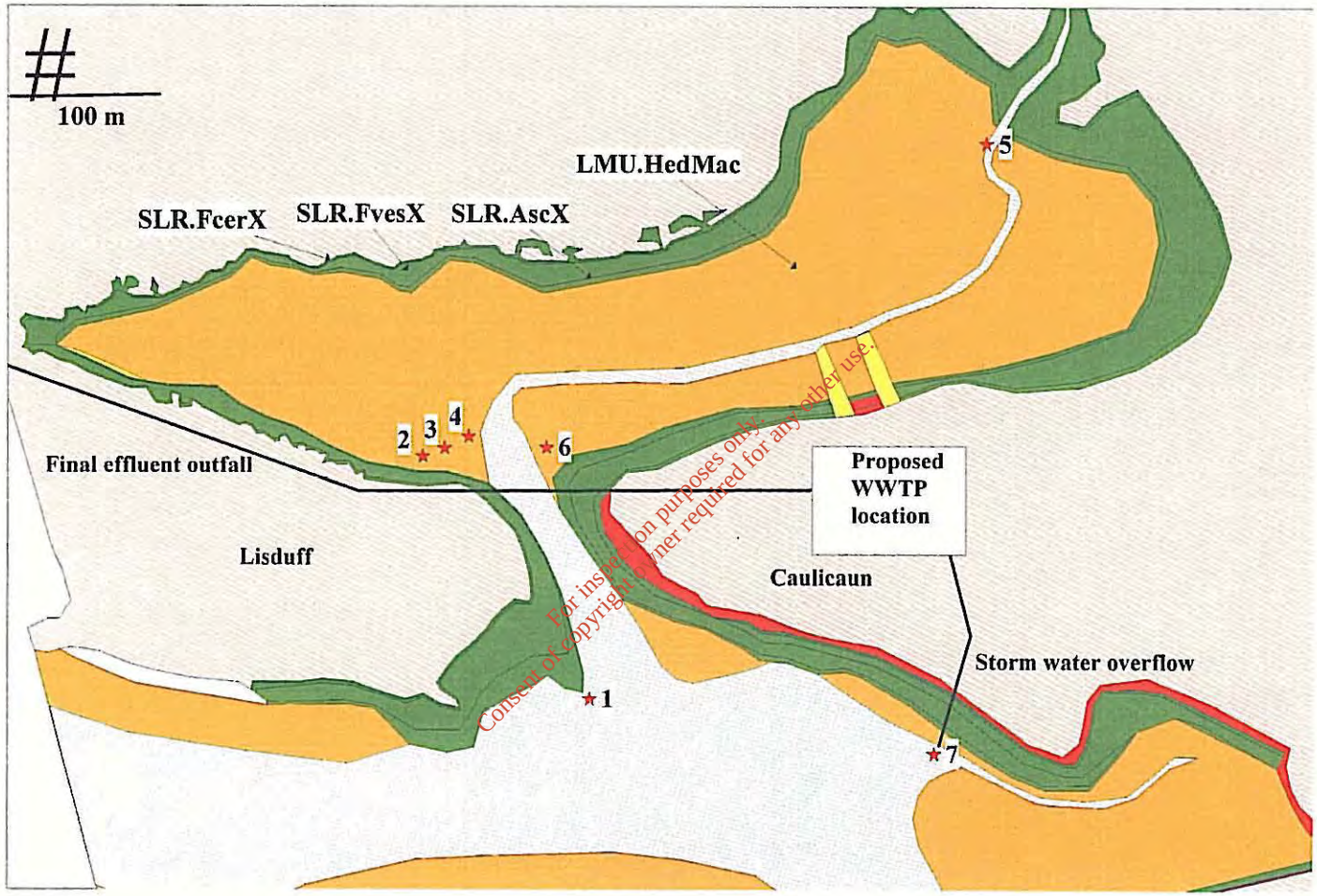

Figure 1.9. Map showing the biotopes of the Lisduff area. Colours indicate the higher biotope codes (Appendix 10).

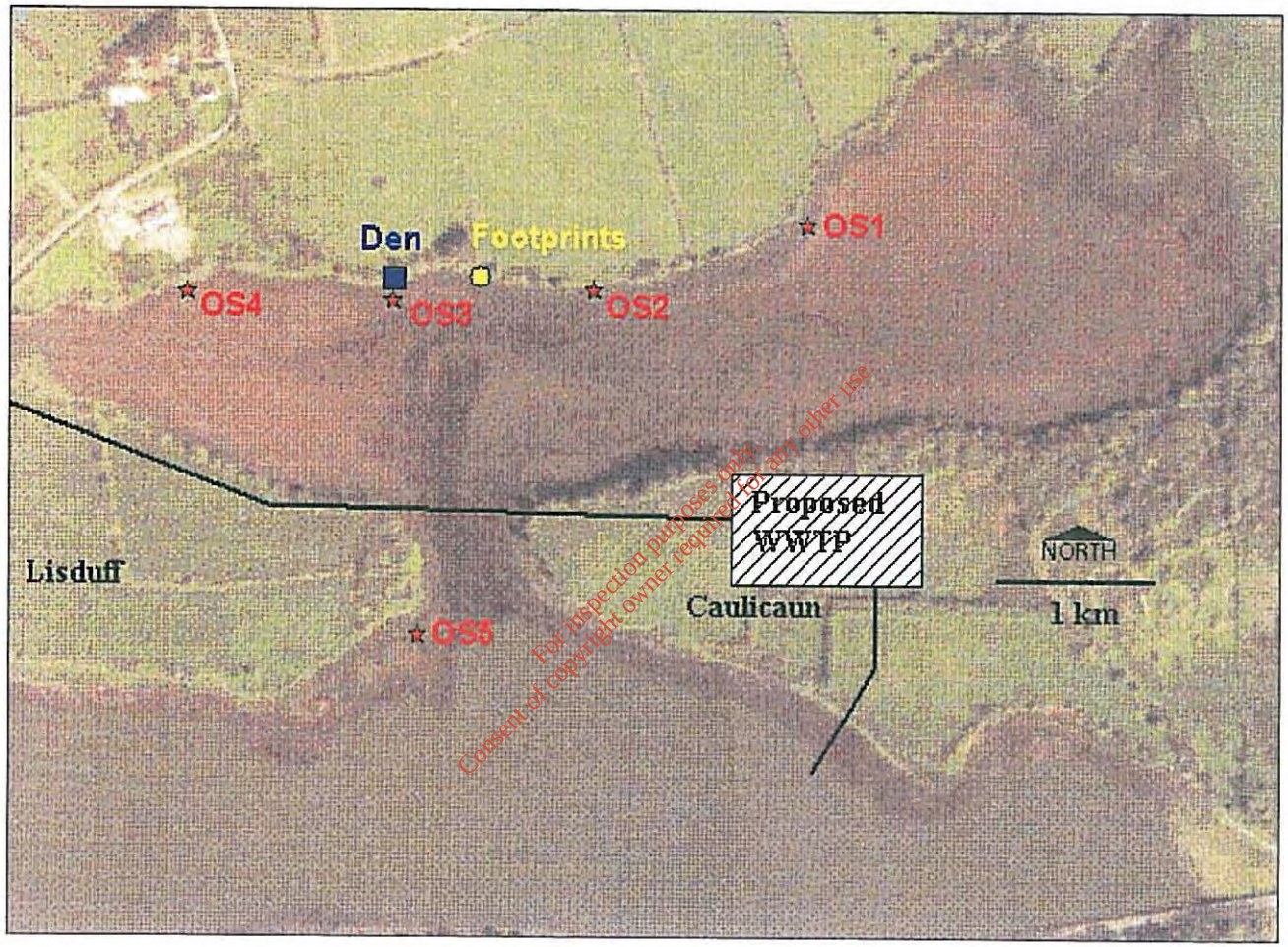

Figure 1.10. Map showing the location of otter footprints (in yellow), an otter den (in blue) and otter spraints (OS1 – OS5 in red).

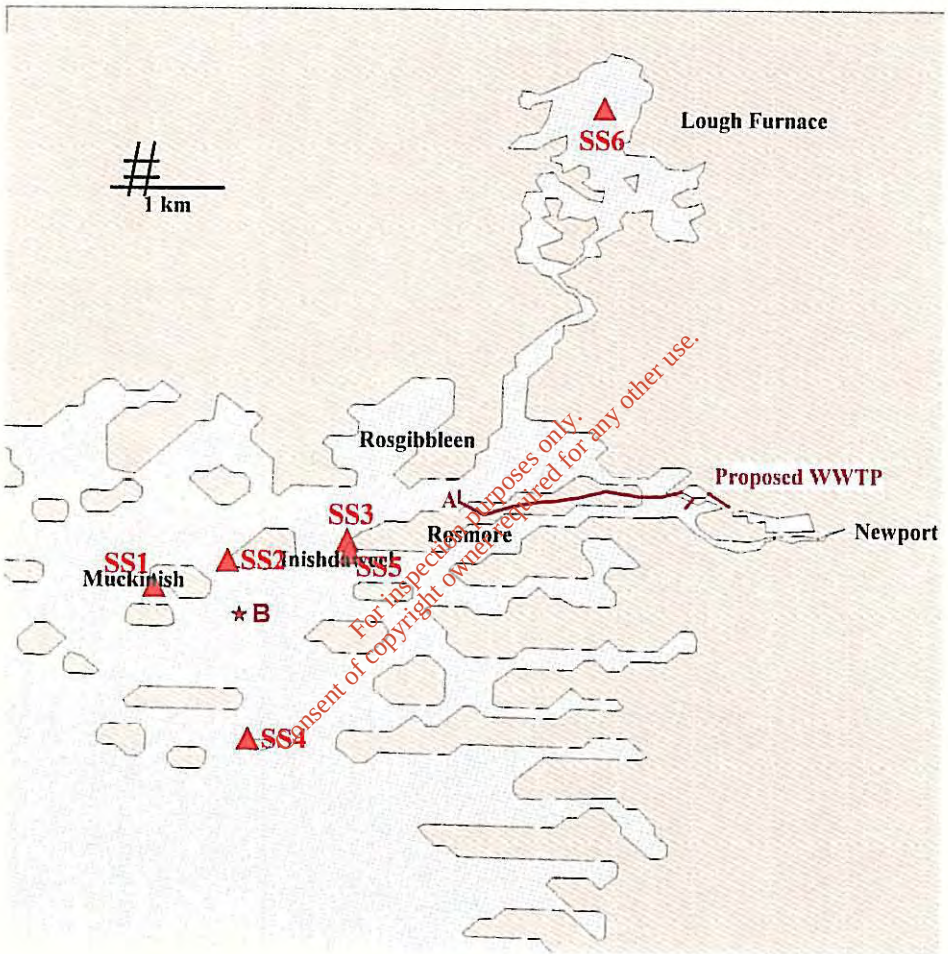

Figure 1.11. Map showing the locations of seal sightings during the current survey.

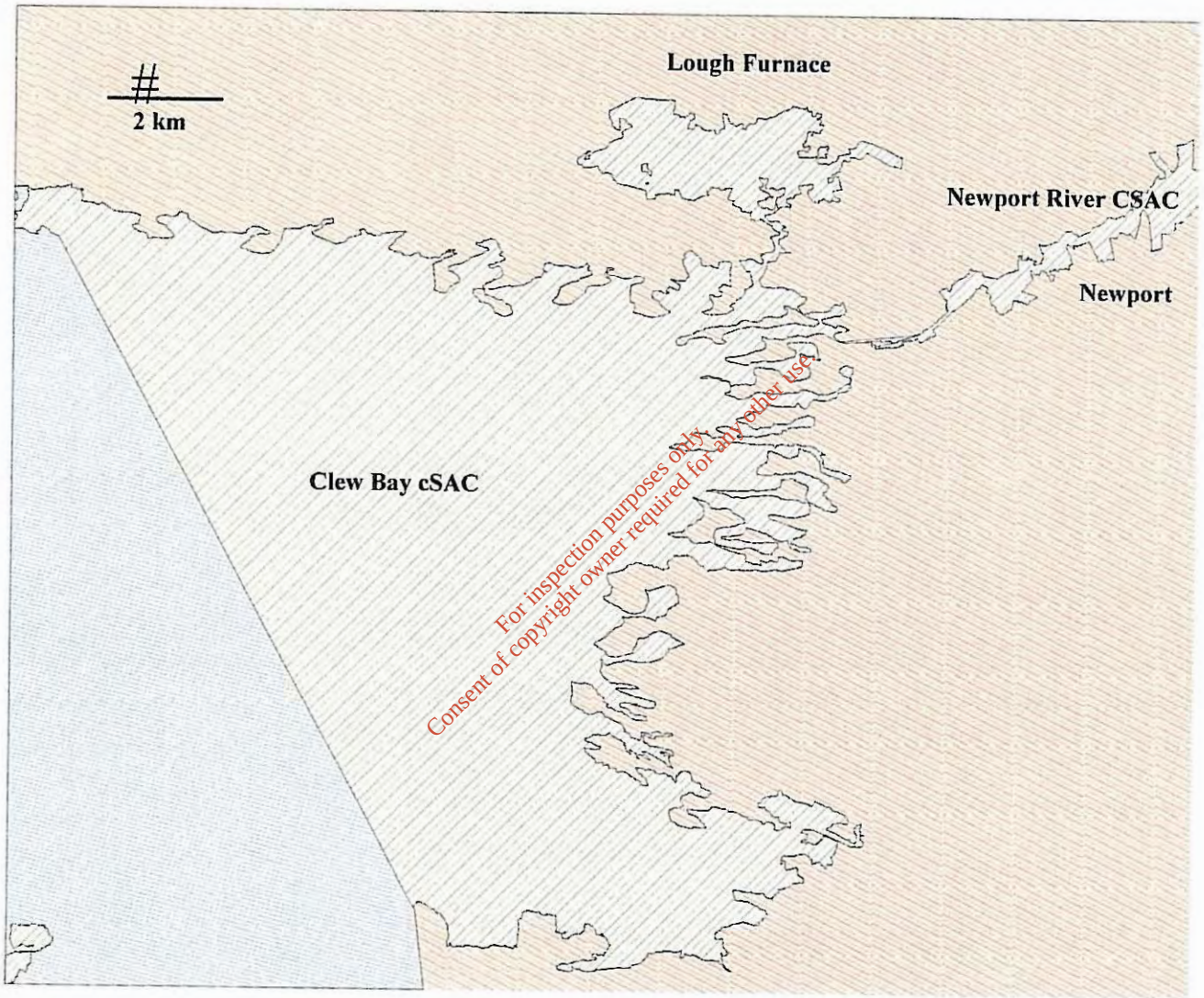

Figure 1.12. Location of Clew Bay cSAC and Newport River cSAC.

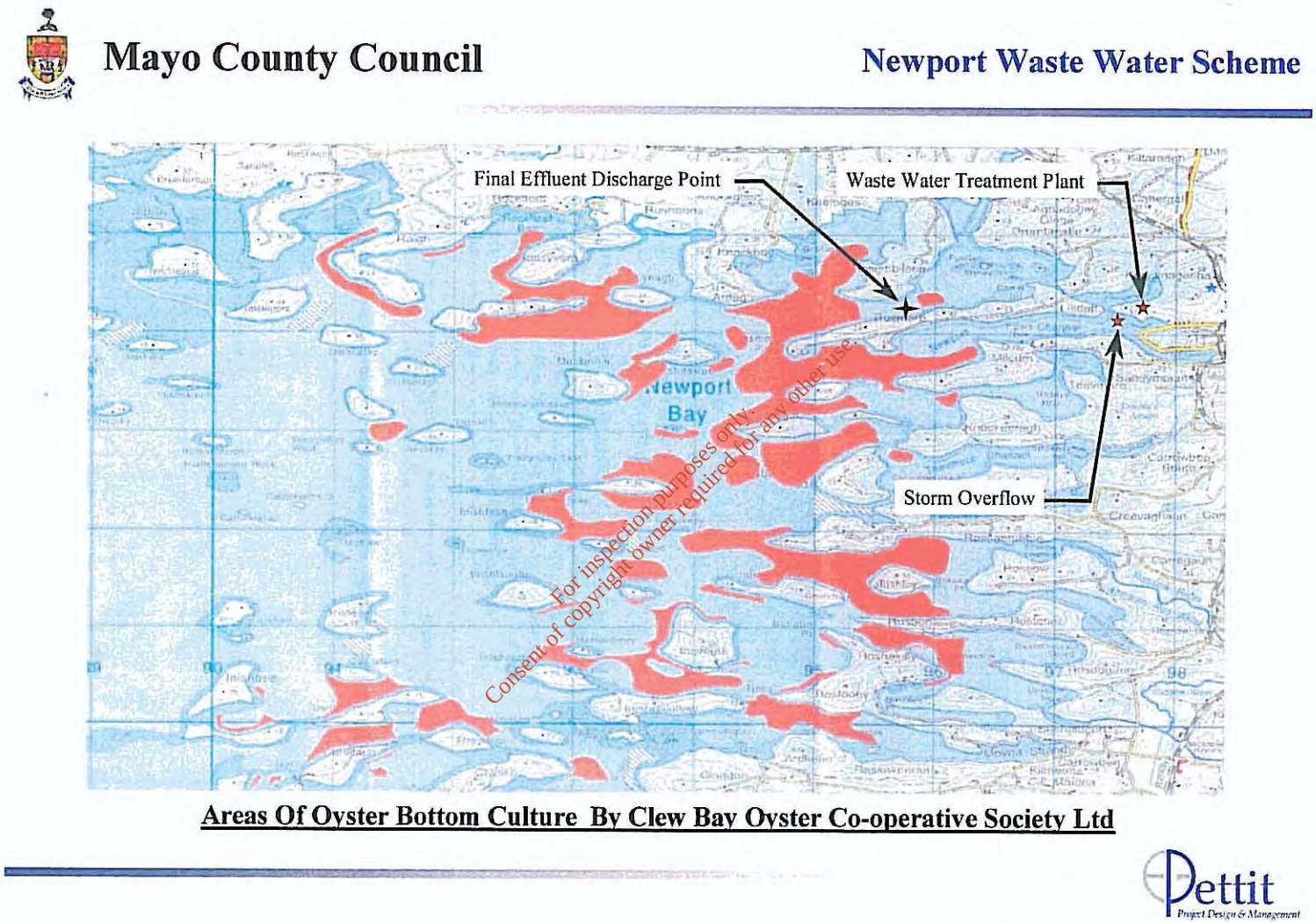

Figure 1.13. The areas in red represent the wild, native oyster fishery, *O. edulis* within Clew Bay (Alan Stoney, Clew Bay Oyster Co-operative Society).

APPENDIX 2. LITTORAL FAUNA

APPENDIX 2. LITTORAL FAUNA

Table 2.1. Macrofaunal and floral species recorded from the littoral survey of Muckinish. The list is arranged in taxonomic order. P=present, R=rare, O=occasional, F=frequent, A=abundant, SA=super abundant (after Hiscock, 1996).

Biotope Code / Species/Higher taxa	LR.YG	LR.Ver	SLR.Pel	SLR.Fspi	SLR.AscX	SLR.FserX	IGS.Sell	IMX
Porifera (sponges)								
Halichondria panicea	-	-	-	-	-	-	O	-
Actinia equina	-	-	-	-	O	-	-	-
Polychaeta (bristle worms)								
Cirratulus filiformis	-	-	-	-	-	-	P	-
Pista cristata	-	-	-	-	-	-	P	-
Pomatoceros triqueter	-	-	-	-	-	-	O	-
Spirorbidae	-	-	-	-	O	A	-	-
Crustacea (crabs, amphipods, barnacles)								
Semibalanus balanoides	-	-	-	O	-	-	-	-
Amphipoda indet.	O	-	-	O	-	-	-	-
Idotea sp.	-	-	-	-	O	-	-	-
Pagurus bernhardus	-	-	-	-	-	-	-	P
Carcinus maenas	-	-	P	P	O	O	-	P
Mollusca (bivalves and gastropods)								
Patella vulgata	-	-	-	O	O	-	-	-
Osilinus lineatus	-	-	-	O	-	-	-	-
Gibbula cineraria	-	-	-	-	O	-	-	-
Gibbula umbilicalis	-	-	-	-	O	-	-	-
Littorina littorea	-	-	-	-	O	O	C	-
Melarhaphe neritoides	-	-	O	-	-	-	-	-
Littorina mariae	-	-	-	O	C	-	-	-
Littorina obtusata	-	-	-	-	-	O	-	-
Littorina saxatilis	-	C	C	O	O	-	-	-
Cingula cingillus	-	-	P	-	-	-	-	-
Nucella lapillus	-	-	-	-	O	-	-	-
Chlamys varia	-	-	-	-	P	P	P	-
Anomia ephippium	-	-	-	-	-	F	C	-
Dosinia exoleta	-	-	-	-	-	-	P	-
Tapes decussatus	-	-	-	-	-	-	-	P
Venerupis senegalensis	-	-	-	-	-	-	P	-
Ascidiacea (sea squirts)								
Botryllus schlosseri	-	-	-	-	-	O	-	-
Pisces (fish)								
Lepadogaster sp.	-	-	-	-	-	-	-	P
Rhodophycota (red algae)								
Rhodothamniella floridula	-	-	-	-	O	-	-	-
Mastocarpus stellatus	-	-	-	-	-	-	O	-

Biotope Code / Species/Higher taxa	LR.YG	LR.Ver	SLR.Pel	SLR.Fspi	SLR.AscX	SLR.FserX	IGS.Sell	IMX
Polysiphonia lanosa	-	-	-	-	F	-	-	-
Chromophycota (brown algae)								
Ascophyllum nodosum	-	-	-	-	SA	O	O	-
Fucus serratus	-	-	-	-	O	C	O	-
Fucus spiralis	-	-	F	C	-	-	-	-
Fucus vesiculosus	-	-	-	-	O	O	-	-
Pelvetia canaliculata	-	O	C	F	-	-	-	-
Himanthalia elongata	-	-	-	-	-	-	O	-
Chlorophycota (green algae)								
Cladophora sp.	-	-	-	-	O	-	-	-
Lichens	-	-	-	-	-	-	-	-
Lichina pygmaea	-	O	-	-	-	-	-	-
Verrucaria maura	C	A	F	C	C	-	-	-
Yellow and grey lichens	C	P	-	-	-	-	-	-
Total no. species/higher taxa	**3**	**5**	**7**	**10**	**19**	**10**	**13**	**4**

Table 2.2. Macrofaunal and floral species recorded from the littoral survey of Inishdaweel West. The list is arranged in taxonomic order. P=present, R=rare, O=occasional, F=frequent, A=abundant, SA=super abundant (after Hiscock, 1996).

Biotope Code / Species/Higher taxa	LR_YG	LR_Ver	SLR_Pel	SLR_Fspi	SLR_FserX	SLR_AscX	IGS_Sell
Porifera (sponges)							
Halichondria panicea	-	-	-	-	F	-	-
Halisarca dujardini	-	-	-	-	P	-	-
Cnidaria (hydroids)							
Dynamena sp.	-	-	-	-	-	-	F
Polychaeta (bristle worms)							
Pomatoceros triqueter	-	-	-	-	F	-	-
Spirorbidae indet.	-	-	-	-	A	F	F
Crustacea (crabs, amphipods, barnacles)							
Semibalanus balanoides	-	-	-	O	-	-	-
Amphipoda indet.	O	-	-	O	-	-	-
Pagurus bernhardus	-	-	-	-	F	-	-
Carcinus maenas	-	-	P	P	O	-	-
Mollusca (bivalves and gastropods)							
Lepidochitona cinerea	-	-	-	-	-	P	-
Diodora graeca	-	-	-	-	O	-	-
Patella vulgata	-	-	-	P	-	-	-

Biotope Code / Species/Higher taxa	LR_YG	LR_Ver	SLR_Pel	SLR_Fspi	SLR_FserX	SLR_AscX	IGS_Sell
Osilinus lineatus	-	-	-	O	-	-	-
Gibbula cineraria	-	-	-	-	O	F	-
Gibbula umbilicalis	-	-	-	-	-	O	-
Littorina littorea	-	-	-	-	O	-	F
Melaraphe neritoides	-	-	O	-	-	-	-
Littorina mariae	-	-	-	O	-	-	-
Littorina obtusata	-	-	-	-	C	F	O
Littorina saxatilis	-	C	C	O	-	-	-
Nucella lapillus	-	-	-	-	O	O	-
Mytilus edulis	-	-	-	-	F	-	-
Modiolus barbatus	-	-	-	-	P	-	-
Chlamys varia	-	-	-	-	P	-	-
Anomia ephippium	-	-	-	-	A	-	P
Venerupis senegalensis	-	-	-	-	-	-	P
Bryozoa (sea mats)							
Electra pilosa	-	-	-	-	O	-	-
Ascidiacea (sea squirts)							
Botryllus schlosseri	-	-	-	-	F	-	-
Botrylloides leachi	-	-	-	-	-	-	P
Rhodophycota (red algae)							
Rhodothamniella floridula		-	-	-	F	A	-
Corallinaceae indet.		-	-	-	F	-	O
Corallina officinalis	-	-	-	-		P	-
Mastocarpus stellatus	-	-	-	-		O	F
Polysiphonia lanosa	-	-	-	-	O	F	-
Chromophycota (brown algae)							
Ascophyllum nodosum	-	-	-	-	F	SA	O
Fucus serratus	-	-	-	-	A	-	F
Fucus spiralis	-	-	F	C	-	-	-
Fucus vesiculosus	-	-	-	-	-	O	-
Pelvetia canaliculata	-	O	C	F	-	-	-
Himanthalia elongata	-	-	-	-	-	-	O
Chlorophycota (green algae)							
Ulva sp.	-	-	-	-	-	O	-
Enteromorpha sp.	-	-	-	-	-	O	-
Lichens	-	-	-	-	-	-	-
Lichina pygmaea	-	O	-	-	-	-	-
Verrucaria maura	C	A	F	C	-	-	-
Yellow and grey lichens	C	-	-	-	-	-	-
Total no. species/higher taxa	**3**	**4**	**6**	**10**	**22**	**14**	**12**

Table 2.3. Macrofaunal and floral species recorded from the littoral survey of Inishdaweel East. The list is arranged in taxonomic order. P=present, R=rare, O=occasional, F=frequent, A=abundant, SA=super abundant (after Hiscock, 1996).

Biotope Code / Species/Higher taxa	LGS_Tal	SLR_Pel	SLR_Fspi	SLR_FvesX	SLR_AscX	IMX
Sipuncula						
Sipuncula indet.	-	-	-	-	-	P
Polychaeta (bristle worms)						
Glycera sp.	-	-	-	-	-	P
Pista cristata	-	-	-	-	-	P
Pomatoceros triqueter	-	-	-	O	-	-
Spirorbidae indet.	-	-	-	F	F	-
Crustacea (crabs, amphipods, barnacles)						
Semibalanus balanoides	-	-	O	-	-	-
Amphipoda indet.	O	-	O	-	-	-
Carcinus maenas	-	P	P	O	-	-
Mollusca (bivalves and gastropods)						
Patella vulgata	-	-	O	O	-	-
Osilinus lineatus	-	-	O	-	-	-
Gibbula cineraria	-	-	-	-	F	-
Gibbula umbilicalis	-	-	-	O	O	-
Littorina littorea	-	-	-	O	-	-
Melaraphe neritoides	-	O	-	-	-	-
Littorina obtusata	-	-	O	F	F	-
Littorina saxatilis	-	C	O	O	-	-
Nucella lapillus	-	-	-	O	O	-
Cerastoderma edule	-	-	-	-	-	F
Tapes rhomboides	-	-	-	-	-	P
Ascidiacea (sea squirts)						
Botryllus schlosseri	-	-	-	P	-	-
Rhodophycota (red algae)						
Porphyra sp.	-	-	-	O	-	-
Rhodothamniella floridula	-	-	-	F	A	-
Corallina officinalis	-	-	-	-	P	-
Mastocarpus stellatus	-	-	-	-	O	-
Polysiphonia lanosa	-	-	-	-	F	-
Chromophycota (brown algae)						
Ascophyllum nodosum	-	-	-	O	SA	-
Fucus spiralis	-	F	C	-	-	-
Fucus vesiculosus	-	-	-	C	O	-
Pelvetia canaliculata	-	C	F	-	-	-
Chlorophycota (green algae)						
Enteromorpha sp.	-	-	-	-	O	-
Ulva sp.	-	-	-	-	O	-

Biotope Code / Species/Higher taxa	LGS_Tal	SLR_Pel	SLR_Fspi	SLR_FvesX	SLR_AscX	IMX
Lichens						
Verrucaria maura	C	F	C	-	-	-
Total no. species/higher taxa	**2**	**6**	**10**	**14**	**13**	**5**

Table 2.4. Macrofaunal and floral species recorded from the littoral survey of Rosmore Point. The list is arranged in taxonomic order. P=present, R=rare, O=occasional, F=frequent, A=abundant, SA=super abundant (after Hiscock, 1996).

Biotope Code / Species/Higher taxa	LR_YG	LR_Ver	SLR_Pel	SLR_Fspi	SLR_FvesX	SLR_AscX	ELR_BPat_Sem
Cnidaria (sea anemones)							
Actinia equina	-	-	-	-	P	-	-
Polychaeta (bristle worms)							
Pomatoceros triqueter	-	-	-	-	-	O	-
Spirorbidae indet.	-	-	-	-	-	F	-
Crustacea (crabs, amphipods, barnacles)							
Chthamalus montagui	-	-	-	F	F	-	C
Semibalanus balanoides	-	-	O	-	F	-	A
Amphipoda indet.	F	F	F	-	-	-	-
Carcinus maenas	-	O	O	-	-	-	-
Mollusca (bivalves and gastropods)							
Patella vulgata	-	-		O	O	F	F
Osilinus lineatus	-	-	O	O			O
Gibbula umbilicalis	-	-			O	O	
Littorina littorea	-	-				O	
Littorina obtusata	-	-		O	C	F	
Littorina saxatilis	C	C	F	O	P		P
Turritella communis	-	-	-	-	-	P	-
Nucella lapillus	-	-	-	-	F	O	C
Mytilus edulis	-	-	-	O	O	-	F
Anomia ephippium	-	-	-	-	-	O	-
Cerastoderma edule	-	-	-	-	P	-	-
Bryozoa (sea mats)							
Electra pilosa	-	-	-	-	-	O	-
Rhodophycota (red algae)							
Rhodothamniella floridula	-	-	-	-	-	C	-

Biotope Code / Species/Higher taxa	LR_YG	LR_Ver	SLR_Pel	SLR_Fspi	SLR_FvesX	SLR_AscX	ELR_BPat_Sem
Corallinaceae indet.	-	-	-	-	-	F	-
Mastocarpus stellatus	-	-	-	-	-	O	-
Polysiphonia lanosa	-	-	-	-	O	C	-
Chromophycota (brown algae)							
Ascophyllum nodosum	-	-	-	-	F	A	-
Fucus serratus	-	-	-	-	-	F	-
Fucus spiralis	-	-	O	C			
Fucus vesiculosus	-	-	O	-	C	F	O
Pelvetia canaliculata -	-	O	C	F	-	-	-
Lichens							
Lichina pygmaea	F	F	-	-	-	-	-
Verrucaria maura	C	A	C	O	-	-	-
Yellow and grey lichens	C	-	-	-	-	-	-
Total no. species/higher taxa	**5**	**6**	**9**	**9**	**13**	**17**	**8**

Table 2.5. Macrofaunal and floral species recorded from the littoral survey of Rosmore North Shore. The list is arranged in taxonomic order. P=present, R=rare, O=occasional, F=frequent, A=abundant, SA=super abundant (after Hiscock, 1996).

Biotope Code / Species/Higher taxa	LR_YG	LR_Ver	SLR_Pel	SLR_Fspi	SLR_FserX	IGS
Porifera (sponges)						
Halisarca dujardini	-	-	-	-	O	-
Polychaeta (bristle worms)						
Arenicola marina	-	-	-	-	-	P
Pomatoceros triqueter	-	-	-	-	C	-
Spirorbidae indet.	-	-	-	-	C	-
Crustacea (crabs, amphipods, barnacles)						
Semibalanus balanoides	-	-	-	O	-	-
Amphipoda indet.	O	-	-	O	-	-
Carcinus maenas	-	-	P	P	O	-
Mollusca (bivalves and gastropods)						
Patella vulgata	-	-	-	O	O	-
Gibbula umbilicalis	-	-	-	-	O	-
Littorina littorea	-	-	-	-	F	-
Melaraphe neritoides	-	-	O	-	-	-
Littorina mariae	-	-	-	O	-	-
Littorina obtusata	-	-	-	-	F	-

Biotope Code	LR_YG	LR_Ver	SLR_Pel	SLR_Fspi	SLR_FserX	IGS
Species/Higher taxa						
Littorina saxatilis	-	C	C	O	O	-
Nucella lapillus	-	-	-	-	C	-
Mytilus edulis	-	-	-	-	C	-
Anomia ephippium	-	-	-	-	O	-
Tapes decussatus	-	-	-	-	P	-
Ascidiacea (sea squirts)						
Botryllus schlosseri	-	-	-	-	O	-
Rhodophycota (red algae)						
Rhodothamniella floridula	-	-	-	-	F	-
Corallinaceae indet.	-	-	-	-	F	-
Mastocarpus stellatus	-	-	-	-	F	-
Chondrus crispus	-	-	-	-	O	-
Polysiphonia lanosa	-	-	-	-	O	-
Chromophycota (brown algae)						
Ascophyllum nodosum	-	-	-	-	F	-
Fucus serratus	-	-	-	-	C	-
Fucus spiralis	-	-	F	C	-	-
Fucus vesiculosus	-	-	-	-	F	-
Pelvetia canaliculata	-	O	C	F	-	-
Lichens						
Lichina pygmaea	-	O	-	-	-	-
Verrucaria maura	C	A	F	C	-	-
Yellow and grey lichens	C	-	-	-	-	-
Total no. species/higher taxa	3	4	6	9	22	1

Table 2.6. Macrofaunal and floral species recorded from the littoral survey of Rosgibbileen. The list is arranged in taxonomic order. P=present, R=rare, O=occasional, F=frequent, A=abundant, SA=super abundant (after Hiscock, 1996).

Biotope Code	LGS_Tal	LR_YG	LR_Ver	SLR_Pel	SLR_Fspi	SLR_FvesX	SLR_FserX	SLR_AscX	IMX
Species/Higher taxa									
Cnidaria (sea anemones)									
Actinia equina	-	-	-	-	-	-	-	O	-
Polychaeta (bristle worms)									
Arenicola marina	-	-	-	-	-	-	-	-	P
Pomatoceros triqueter	-	-	-	-	-	-	O	O	-
Spirorbidae indet.	-	-	-	-	-	-	C	F	-
Crustacea (crabs, amphipods, barnacles)									

Biotope Code / Species/Higher taxa	LGS_Tal	LR_YG	LR_Ver	SLR_Pel	SLR_Fspi	SLR_FvesX	SLR_FserX	SLR_AscX	IMX
Chthamalus montagui	-	-	-	-	-	-	-	O	-
Semibalanus balanoides	-	-	P	-	-	F	-	F	-
Amphipoda indet.	-	F	F	-	F	F	-	-	-
Orchestia sp.	-	P	-	-	-	-	-	-	-
Orchestia gammarellus	C	-	-	-	-	-	-	-	-
Carcinus maenas	-	-	-	-	O	O	-	-	-
Mollusca (bivalves and gastropods)									
Patella vulgata	-	-	-	-	-	-	O	O	-
Gibbula umbilicalis	-	-	-	-	-	-	O	O	-
Littorina littorea	-	-	-	-	-	-	O	-	-
Melaraphe neritoides	-	-	O	-	-	-	-	-	-
Littorina obtusata	-	-	-	-	P	F	C	F	-
Littorina saxatilis	-	-	O	C	O	O	-	O	-
Littorina saxatilis var. rudis	-	P	-	-	-	-	-	-	-
Nucella lapillus	-	-	-	-	-	-	O	F	-
Mytilus edulis	-	-	-	-	-	-	-	O	-
Tapes rhomboides	-	-	-	-	-	-	-	-	P
Ascidiacea (sea squirts)									
Botryllus schlosseri	-	-	-	-	-	-	O	-	-
Rhodophycota (red algae)									
Rhodothamniella floridula	-	-	-	-	-	-	F	F	-
Corallinaceae indet.	-	-	-	-	-	-	F	F	-
Chondrus crispus	-	-	-	-	-	-	O		-
Polysiphonia lanosa	-	-	-	-	-	-	F	F	-
Chromophycota (brown algae)									
Ascophyllum nodosum	-	-	-	-	-	F	F	A	-
Fucus serratus	-	-	-	-	-	-	A	O	-
Fucus spiralis	-	-	-	F	F	-	-	-	-
Fucus vesiculosus	-	-	-	-	-	C	F	F	-
Pelvetia canaliculata	-	-	-	C	-	-	-	-	-
Ramalina	-	F	-	-	-	-	-	-	-
Lichens									
Verrucaria maura	-	F	F	C	-	-	-	-	-
Yellow and grey lichens	-	C	-	-	-	-	-	-	-
Total no. species/higher taxa	**1**	**6**	**5**	**4**	**5**	**7**	**15**	**17**	**2**

Table 2.7. Macrofaunal and floral species recorded from the littoral survey of Lisduff. The list is arranged in taxonomic order. P=present, R=rare, O=occasional, F=frequent, A=abundant, SA=super abundant (after Hiscock, 1996).

Biotope Code / Species/Higher taxa	SLR_EphX	SLR_FcerX	SLR_FvesX	SLR_AscX	LMU_HedMac
Polychaeta (bristle worms)					
Hediste diversicolor	-	-	-	-	P
Crustacea (crabs, amphipods, barnacles)					
Chthamalus montagui	-	-	O	O	-
Elminius modestus	-	-	-	P	-
Amphipoda indet.	-	C	F	O	-
Corophium volutator	-	-	-	-	P
Carcinus maenas	-	O	O	O	-
Pelecypoda (bivalves)					
Macoma balthica	-	-	-	-	P
Scrobicularia plana	-	-	-	-	P
Rhodophycota (red algae)					
Polysiphonia lanosa	-	-	-	C	-
Chromophycota (brown algae)					
Ascophyllum nodosum	-	-	C	C	-
Fucus ceranoides	-	A	O	-	-
Fucus vesiculosus	-	O	A	F	-
Chlorophycota (green algae)					
Enteromorpha sp.	C	-	-	-	-
Total no. species/higher taxa	1	4	6	7	4

Table 2.8. Macrofaunal and floral species recorded from the BioMar sites, 1995 and 1996 (Picton and Costello 1998). The list is arranged in taxonomic order. P=present, R=rare, O=occasional, F=frequent, A=abundant, SA=super abundant (after Hiscock, 1996).

Species/Higher taxa	Carraholly	Claggan	Mullaranny
Sipuncula (unsegmented worms)			
Golfingia vulgaris vulgaris	F	-	-
Polychaeta (bristle worms)			
Polychaeta indet.	F	F	-
Eteone longa	-	-	P
Capitella capitata	-	-	P
Glycera tridactyla	F	-	P
Nephtys indet.	-	-	P
Nephtys hombergii	F	F	P
Nephtys caeca	-	-	P
Marphysa bellii	-	F	-

Species/Higher taxa	Carraholly	Claggan	Mullaranny
Orbiniidae indet.	-	F	-
Orbinia latreillii	-	F	-
Scoloplos armiger	A	C	-
Scoloplos cirratulus	-	-	F
Cirratulus cirratus	F	-	-
Arenicola marina	C	A	F
Maldanidae	C	F	-
Clymenura clypeata	F	-	-
Heteroclymene robusta	-	F	-
Echinogammarus marinus	-	O	-
Crustacea (crabs, amphipods and barnacles)			
Bathyporeia pilosa	-	-	P
Talitrus saltator	-	-	P
Talorchestia brito	-	-	C
Corophium sp.	-	P	-
Pagurus bernhardus	-	P	-
Carcinus maenas	-	P	P
Mollusca (snails and bivalves)			
Littorina littorea	-	F	-
Littorina saxatilis	-	P	-
Ventrosa ventrosa	-	P	-
Mytilus edulis	-	R	-
Cerastoderma edule	-	R	F
Angulus tenuis	-	-	P
Macoma balthica	-	-	F
Chromophycota (brown algae)			
Ascophyllum nodosum	-	P	-
Fucus serratus	-	P	-
Fucus vesiculosus	-	P	-
Total no. species/higher taxa	**9**	**21**	**15**

APPENDIX 3. SUBLITTORAL FAUNA

APPENDIX 3. SUBLITTORAL FAUNA

Table 3.1 Site locations and details of subtidal grab sites. + - sample taken

Site Code: Subtidal	Date	Time	Weather	Grid Ref	Replicates	O2 (%)	O2 (mg/l)	Salinity	Chemistry Sediment	Water	Shellfish	Plants	Biology Grab	Fish	Temperature (°C)	Depth (m)	Notes
ST1	20/10/04	16.00		53 55.212 09 34.128	+	78	8.4	10.6	+	+			+		12	8	Black, anoxic muds
ST2 - A	20/10/04	15.13		53 54.587 09 34.202	+	81	8	7.8	+	+			+		11.1	5.5	Black, anoxic muds with org matter
ST3	18/10/04	17.21		53 53.884 09 34.538	+	99	10.1	13.1	+	+			+		11.2	1.2	
ST4	18/10/04	16.48		53 53.458 09 34.914	+	97	9.3	28.9	+	+			+		12	2	Fine anoxic muds with matted algae
ST5 - C	18/10/04	15.59		53 53.273 09 35.241	+	93	8.9	30.1	+	+			+		12	3	Black, anoxic muds with large shell
ST6	18/10/04	15.12		53 53.224 09 35.673	+	98	10.9	33.4	+	+			+		11.4	3.1	
ST7	18/10/04	14.15		53 53.158 09 36.157	+	96	10.7	28.2	+	+			+		11.8	2.4	Mud with coarse shell
ST8	18/10/04	13.31		53 53.053 09 37.249	+	96	10.5	31.1	+	+			+		12.1	3.5	Black anoxic muds some maerl and shell
ST9	18/10/04	12.57		53 52.782 09 36.870	+	97	10.6	30.3	+	+			+		11.9	3.1	Black anoxic muds some maerl

ST10	18/10/04	12.15		53 52.88 6 09 35.92 6	+	96	10.5	28	+ +	+	11.6	3.6	Black anoxic muds dead maerl plus sipunculid / polychaetes
ST11	19/10/04	11.53	Sunshine, Calm	53 53.12 6 09 34.59 4	+	90	9	31.1	+ +	+	11.8	3.6	
ST12 - B	19/10/04	11.05	Sunshine, Calm	53 53.18 8. 09 33.68 4	+	89	9	24.8	+ +	+	11.1	3.4	Fine sand - some leaf litter worm tubes - 1 polychaete
ST13	19/10/04	10.40	Sunshine, Calm	53 53.03 7 09 32.95 9	+	92	9.9	15.5	+ +	+	9.3	2.8	Black, anoxic muds. Some leaves No flora or fauna
ST14 - D	18/10/04		Slight swell	53 52.10 8 09 37.31 3	+	95	9.4	32.9	+ +	+	12.2	7	Black, anoxic muds. Many polychaetes

Table 3.2. List of species or higher taxa recorded from each grab site. The list is arranged in taxonomic order.

Site	ST1				ST2				ST3				ST4				ST5				ST6			
Species or higher taxa	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
Cnidaria (hydroids and sea anemones)																								
Actinia equina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Sipuncula																								
Sipuncula indet.	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	14	1	-	6
Polychaeta (bristle worms)																								
Sthenelais boa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-
Paranaitis kosteriensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Phyllodoce sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Glycera sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
Glycera rouxii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-
Goniada maculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Hediste diversicolor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Nephtys hombergii	-	-	-	-	-	-	-	-	2	2	1	-	-	2	1	1		1	1		1	2	-	1
Orbiniidae indet.	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arenicola defodiens	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-
Terebellides stroemi	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	6	4	1	-	-	-	-	-
Trichobranchus glacialis	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	4	-	-	-
Terebellidae indet.	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Crustacea (crabs and barnacles)																								
Balanus crenatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Mollusca (snails and bivalves)																								
Calyptraea chinensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-
Nucula nucleus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-
Nucula tenuis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	2	-	-	-	-
Chlamys varia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Parvicardium exiguum	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fabulina fabula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-

Site	ST1				ST2				ST3				ST4				ST5				ST6			
Species or higher taxa	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
Venerupis senegalensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-
Chamelea gallina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	P	-	-
Tunicata (sea squirts)																								
Ascidiacea indet.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Dendrodoa grossularia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Chironomida indet. (midge larvae)	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total no. species/higher taxa	0	0	0	0	0	0	1	0	1	3	1	0	4	2	3	2	5	5	6	6	4	4	0	2
Biotope Code	-	-	-	-	-	-	-	-	IMU	IMU	IMU	-	IMU	IMU	IMU	IMU	IMU	IMU	IMU	IMU	IMU	IMU	-	IMU

Table 3.2. Contd.

Site	ST7				ST8				ST9				ST10				ST11				ST12			
Species or higher taxa	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
Cnidaria (hydroids and sea anemones)																								
Actiniaria indet.	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Priapulida																								
Priapulus caudatus	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sipuncula																								
Sipuncula indet.	1	5	1	1	2	-	1	-	-	-	2	3	2	-	-	1	-	-	-	-	-	-	-	-
Golfingia vulgaris	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Polychaeta (bristle worms)																								
Harmothoe sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sthenelais boa	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Glycera sp.	1	1	-	-	1	2	-	1	2	-	2	1	1	1	-	1	-	-	-	-	-	-	-	-
Glycera rouxii	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perinereis cultrifera	-	1	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Site	ST7				ST8				ST9				ST10				ST11				ST12			
Species or higher taxa	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
Nephtys sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-	1	-	-	-
Nephtys hombergii	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	1	-	-	-	-	-	-	-	-
Lumbrineris latreilli	1	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arenicola sp.	-	-	-	-	3	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Terebellides stroemi	-	-	-	-	-	5	2	1	-	-	1	2	-	3	1	1	-	-	-	-	-	-	-	-
Trichobranchus glacialis	2	-	-	-	3	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Terebellidae indet.	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lanice conchilega	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Neoamphitrite figulus	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pista cristata	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Urothoe sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
Crustacea (crabs and barnacles)																		-	-	-	-	-	-	-
Liocarcinus arcuatus	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mollusca (snails and bivalves)																		-	-	-	-	-	-	-
Nucula nucleus	3	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Nucula tenuis	-	-	2	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Anomia ephippium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Parvicardium scabrum	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fabulina fabula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moerella pygmaea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-
Tapes rhomboides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Chamelea gallina	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Tunicata (sea squirts)																								
Ascidiacea indet.	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ascidia virginea	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rhodophycota (red algae)																-	-	-	-	-	-	-	-	-
Corallinaceae indet.	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total no. species/higher taxa	7	6	4	3	7	2	4	4	5	2	3	3	5	5	3	5	4	0	0	0	1	0	0	0
Biotope Code	IMU	IMU	IMU	IMU	IMU	IMU	IMU	IMU	IMU	IMU	IMU	IMU	IMU	IMU	IMU	IMU	IMU	-	-	-	IMU	-	-	-

Table 3.2. Contd.

Site	ST13				ST14			
Species or higher taxa	**A**	**B**	**C**	**D**	**A**	**B**	**C**	**D**
Sipuncula								
Sipuncula indet.	-	-	-	-	6	-	-	-
Polychaeta (bristle worms)								
Harmothoe sp.	-	-	-	-	1	-	-	-
Nereiphylla rubiginosa	-	-	-	-	1	-	-	-
Glyceridae indet.	-	-	-	-	-	-	-	1
Glycera sp.	-	-	-	-	2	-	1	-
Hediste diversicolor	-	4	3	-	-	-	-	-
Lumbrineris sp.	-	-	-	-	-	-	3	-
Lumbrineris latreilli	-	-	-	-	1	1	-	2
Arenicolidae indet.	-	-	-	-	-	10	-	-
Arenicola sp.	-	-	-	-	5	-	-	-
Terebellides stroemi	-	-	-	-	1	-	2	2
Neoamphitrite figulus	-	-	-	-	1	-	-	-
Crustacea (crabs and barnacles)	-	-	-	-	-	-	-	-
Pagurus bernhardus	-	-	-	-	-	1	-	-
Mollusca (snails and bivalves)	-	-	-	-	-	-	-	-
Spisula elliptica	-	1	-	-	-	-	-	-
Chamelea gallina	-	-	-	-	-	1	-	-
Total no. species/higher taxa	0	2	1	0	8	4	3	3
Biotope Code	-	IMU	IMU	-	IMU	IMU	IMU	IMU

APPENDIX 4. FISH SURVEY

APPENDIX 4. FISH SURVEY

Table 4.1. Location of fish beach seine net surveys.

Site	Date	Position				Time
		Latitude		Longitude		
FS1	20/10/04	53	52.919	09	35.090	10:24
FS2	20/10/04	53	52.919	09	35.090	11:00

Table 4.2. Species recorded from beach seine net surveys.

Site	Species	Common name	Abundance	Size (cm)
FS1	*Pollachius pollachius*	Pollack	4	14, 12, 12, 13
	Crenilabrus melops	Corkwing wrasse	1	6
	Palaemonidae indet.	Prawn	1	
FS2	*Pollachius pollachius*	Pollack	2	13, 14
	Gobiusculus flavescens	Two-spotted goby	2	4, 4

APPENDIX 5. FRESHWATER SURVEY

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Table 5.1. Number of species or higher taxa found in the freshwater macroinvertebrate survey in the Newport River, Co. Mayo. (The EPA faunal indicator groups of sensitivity to pollution are A - sensitive, B - less sensitive, C - tolerant, D - very tolerant and E - most tolerant).

Site Name:	SW1	EPA
ANNELIDA		
Oligochaeta (worms)		
Lumbricidae indet.	3	N/A
CRUSTACEA		
Gammarus sp.	25	C
MOLLUSCA		
Gastropoda (snails)		
Lymnaea peregra	1	C
ARTHROPDA – INSECTA		
Ephemeroptera (mayflies)		
Baetis muticus	6	B
Baetis rhodani	10	C
Plecoptera (stoneflies)		
Leuctra hippopus	2	A
Trichoptera (caddis flies)		
Agapetus fuscipes	14	B
Limnephilidae indet.	5	B
Hydropsyche siltalai	7	C
Chimarra marginata	8	C
Coleoptera (beetles)		
Elmis aenea	2	C
Limnius volckmari	4	C
No. of taxa	**12**	
Q-value	**Q3-4**	

* N/A: Scheme not applicable

Table 5.2. Summary of the physical data recorded from each site.

Site	Conductivity	Temp °C	O_2(mg/l)	O_2%	pH	Depth cm	Siltation	Water clarity	Habitats sampled	Overhead vegetation
FW1	105.1	10.2	11.0	99	7.21	10	Slight	Clear but peat stained	Riffles	Present at margins

Table 5.3. EPA biotic indices and water quality classes (McGarrigle *et al.*, 2002).

Biotic Index	Quality Status	Quality Class
Q5, 4-5, 4	Unpolluted	Class A
Q3-4	Slightly polluted	Class B
Q3, 2-3	Moderately polluted	Class C
Q2, 1-2, 1	Seriously polluted	Class D

Table 4. Summary of data collected during the *Margaritifera margaritifera* survey in the Newport River.

No.	Section name	Date	River levels	Water temp. (°C)	Air temp. (°C)	Cloud cover ($1/8^{th}$)	Sunshine (% of survey)	*Clear visibility depth (cm)	Rainfall
1	Dunmore to River Gully	8/11/04	low	10.2	8	1	95	>90	None

* This is an estimate of the maximum depth which the river bed could be viewed clearly at.