

Excerpt from SNIFFER (Scotland and Northern Ireland Forum for Environmental Research) on **Heavily Modified Water Bodies in Scotland - Identification of provisional HMWB** (October 2005)

Table 1 - Tentative criteria and system of confidence levels for identification of pHMWB lochs, based on the results of this work and UKTAG guidelines.

		pHMWB		not pHMWB		
		CONFIDENCE LEVEL				
		HIGH	MEDIUM	LOW	MEDIUM	HIGH
PHYSICAL MODIFICATION	change of water body type	Loch created through land claim on transitional water body, or by impoundment of river.				
	impoundment	Clear discontinuity in width at dam and dam marked clearly on 1:50,000 map, with an associated embankment.	Clear discontinuity in width at dam and dam marked on 1:50,000 map without an embankment but not labelled "weir".	Two or more weirs/slucices on outlet	Single weir/slucice or navigation locks on inlet/ outlet	Impoundment not specifically marked on 1:50,000 map, even if its position is discernible from the plan shape of the water body
	forestry / intensive use		>70% of shoreline afforested	50-69% of shoreline afforested	<50% of shoreline afforested	
	bank construction/ reinforcement	>20% of shoreline affected by hard engineering	>20% of shoreline affected		<20% of shoreline affected	
	construction	Structures causing >10% loss of two or more habitat types	At least one structure >15% by area plan view	At least one structure causing >10% loss of any one habitat type		

Table 2 - Tentative criteria and system of confidence levels for identification of pHMWB rivers, based on the results of this work and UKTAG guidelines.

		pHMWB		not pHMWB		
		CONFIDENCE LEVEL				
		HIGH	MEDIUM	LOW	MEDIUM	HIGH
PHYSICAL MODIFICATION	impoundment	Clear width discontinuity at dam, which is shown clearly on 1:50,000 map with an associated embankment; or water body immediately downstream of such a dam; or water body contains an impoundment of any size that takes all water except for spate flows	Clear width discontinuity at dam, which is marked on 1:50,000 map without an embankment but not labelled "weir".	Multiple weirs or sluices present	Single weir or sluice present	Impoundment not marked on 1:50,000 map
	urbanisation	Water body 100% urbanised to banks on 1:50,000 map	>70% of water body urbanised		<70% of water body urbanised	
	reinforcement, resectioning, flood embankments	Water body 100% affected (both banks)	> 6 km or >60% of either bank affected		< 6 km or <60% of either bank affected	
	culverting	>200 m, impassable	>200 m, passable	<200 m, impassable	<200 m, passable	
	straightening		>5km or >50% of water body straightened		<5km or <50% straightened	
	afforestation	Water body completely afforested (planted to banks)	>6 km or >60% of water body afforested (planted to banks)		<6 km or <60% afforested	

Table 3 - Summary of criteria for identification of pHMWB **transitional** waters in Scotland.

Specified uses*					Specific pressure (UKTAG 2003)	UKTAG criterion for good/moderate boundary	Data sources applied for Scotland
N	F	D	HW	O			
√					Land claim	>15% of intertidal area affected	GIS interactive map (OS 1:50 000) for location; 1:10,000 maps and admiralty charts for extent
						>15% change in normal tidal range	
	√	√			Bank/shoreline reinforcement	>15% bank/shoreline length affected	Coastal defences near high water mark not a risk factor
√	√				Tidal river resectioning	>5% of channel length affected	
						>15% change in normal tidal range	
√					Channel dredging	>15% of channel length affected; critical sections affected	FRS
						>15% of water body area affected; critical areas affected	
				√	Aggregate dredging	>15% of channel length affected	
						>15% of water body area affected	
√					Deposition of dredged material	>15% of area affected	FRS
						Substratum changed over >15% of water body area	
√	√				Tidal river channelisation/realignment/straightening	>15% of channel length affected	
√	√	√	√		Flow manipulation	Changes in salinity mixing regime	
√			√		Impounding	Impoundments present in main channel	
						>10% of water body area affected by tributary channel impoundments	
						Critical areas affected	
						>15% of intertidal	

Specified uses*					Specific pressure (UKTAG 2003)	UKTAG criterion for good/moderate boundary	Data sources applied for Scotland
N	F	D	HW	O			
						areas lost due to raised water levels	
√	√		√	√	Construction	>15% of area affected by structures (including impoundments)	GIS interactive map (OS 1:50 000) for location; 1:10,000 maps and admiralty charts for extent
						Changes in salinity mixing regime	
				√	Intensive use	>30% of saltmarsh more than lightly grazed	
√					Modifications to sediment regime	>15% increase in accretion	
						>10% habitat lost	
				√	Fishing	>15% of subtidal bed area affected	JNCC coastal directories

Specified uses are derived from Hull *et al.* (2003) as: N: navigation; F: flood defence; D: land drainage; HW: hydropower and water supply; O: other. FRS: Fisheries Research Services.

Table 4 - Summary of criteria for identification of pHMWB **coastal** waters in Scotland.

Uses					Specific pressure	UKTAG criterion for good/moderate boundary	Data sources applied for Scotland
N	F	D	HW	O			
√					Land claim	>15% of area affected	GIS interactive map (OS 1:50 000) for location; 1:10 000 maps and admiralty charts for extent
						>15% change tidal current speed/direction	
	√	√			Shoreline reinforcement	>15% coastline length affected	Coastal defences near high water mark not a risk factor
√					Dredging	>15% of seabed area affected	FRS
√					Deposition of dredged material	>15% of seabed area affected	FRS
						Substratum changed over >15% of area	
√	√		√	√	Construction	>15% of area affected by structures	GIS interactive map (OS 1:50 000) for location; 1:10 000 maps and admiralty charts for extent
						>15% change in tidal current speed/direction; substantial interruptions to sediment transport	
√					Manipulation of sediment transport	Enhanced erosion/accretion due to interruptions in sediment transport	
						>10% habitat lost	
				√	Fishing	>15% of seabed area affected	JNCC coastal directories

Specified uses are derived from Hull *et al.* (2003) as: N: navigation; F: flood defence; D: land drainage; HW: hydropower and water supply; O: other. FRS: Fisheries Research Services.