SCORING GUIDELINES

The scoring guidelines below were used to rate various attributes of South African freshwater fish species. The Tables are the result of the expert knowledge inputs from a range of people that were obtained during 2001.

Full documentation relating to the workshop that preceded this process, as well as information related to the use of integrity indices can be found in:

Kleynhans, C.J. 2003. National Aquatic Ecosystem Biomonitoring Programme: Report on a National Workshop on the use of Fish in Aquatic System Health Assessment. NAEBP Report Series No 16. Institute for Water Quality Studies, Department of Water Affairs and Forestry, Pretoria, South Africa.

FLOW-DEPTH CATEGORIES FOR SCORING PREFERENCES OF FISH SPECIES

1) Slow (<0.3 m/s), shallow (<0.5 m): This would include shallow pools and backwaters.

(2) Slow (<0.3 m/s), deep (>0.5 m): This would include deep pools and backwaters

(3) Fast (>0.3 m/s), shallow (<0.3 m): Shallow runs, rapids and riffles would fall in this category. An electrical shocking apparatus was used in these habitat types

(4) Fast (>0.3 m/s), deep (>0.3 m): Deep runs, rapids and riffles would fall under this category. An electrical shocking apparatus was used in these habitat types.

Scoring criteria:

0=NO PREFERENCE, IRRELEVANT
>0 -1= VERY LOW PREFERENCE -COINCIDENTAL?
>1-2 = LOW PREFERENCE
>2-3=MODERATE PREFERENCE
>3-4=HIGH PREFERENCE
>4-5=VERY HIGH PREFERENCE

INTOLERANCE SCORES FOR SPECIES ACCORDING TO SELECTED CRITERIA

Species Intolerance Ratings

Intolerance in this context refers to the degree to which a species is able to withstand alterations of the environmental conditions under which it occurs. This includes modification of physical habitat characteristics (flow velocity, marginal vegetation, depth, bottom substrate, etc.), as well as chemical characteristics of the water habitat. Habitat and food preferences provide a large amount of information, which is useful in determining the degree to which a species can be regarded as tolerant, moderately intolerant and intolerant. Experimental information on the intolerance of various South African fish species is,

however, largely lacking and the assessment of the degree to which species are tolerant or intolerant usually has to be based on field observations.

Four components were taken into account in estimating the intolerance of fish species, *viz.* habitat preferences and specialisation, food preferences and specialisation, requirement for flowing water during different life stages and association with "clean" waters. Each of these aspects were scored for a species according to low requirement/specialisation (rating=1), moderate requirement/specialisation (rating=3) and high requirement/ specialisation (rating=5). The mean of these ratings for a species was calculated to obtain an intolerance score which can lie between one (tolerant) and five (intolerant). A mean value of about three would indicate moderate intolerance. The assessment of the four components of species intolerance were approached in the following way:

(a) Habitat preferences and specialisation:

A classification of fish species according to their habitat preferences in the various river segments was done to determine their relative degree of habitat specialisation. The work of Crass (1964), Gaigher (1969), Pienaar (1978), Kleynhans (1984), Bell-Cross and Minshull (1988), Skelton (1993), Russell (in prep.) and Weeks *et al.* (1996) were consulted for information on habitat preferences. For South Africa, this kind of information is currently mostly limited to adult individuals of species.

In broad terms, occurrence in habitats such as pools, riffles (fast flowing water over cobbles, resulting in broken water surface), rapids (fast flowing water over bedrock), runs (fast flowing water with an unbroken surface) and backwaters (quiet water not situated in the main flow of the river) were considered. Additional habitat characteristics such as a preference for marginal vegetation, water of a certain depth, bottom substrate characteristics and flow velocity were also taken into account. The result of this classification is an indication of the degree of habitat specialisation in various species. Species with a wide habitat preference and little specialisation were rated as 1, those exhibiting some preference and specialisation for habitats which may be limited were rated as 3, while those with a high preference and specialisation for habitats which are often limited, were rated as 5.

(b) Food preferences and specialisation:

This involved the classification of the adults of fish species according to their food preferences in the various river segments. Information on food preferences were assessed (Crass 1964; Gaigher 1969, 1979; Pienaar 1978; Kleynhans 1984; Bell-Cross and Minshull 1988; Skelton 1993) and species grouped according to broad preferences for "Aufwuchs", detritus, invertebrates, plant material or fish. The result of this classification is an indication of the degree to which species in a community specialises in utilising a specific food resource. Such a food resource may be in short supply in a particular segment, require specialisation to be utilised and may be sensitive to environmental disturbance.

Trophic preferences were scored as 1 where species utilise a wide spectrum of food resources and little specialisation is required, 3 where species utilise food resources which may be common but require some degree of specialisation, and 5 in situations where the resource is limited or require a high degree of specialisation.

(c) Requirements for flowing water during different life-stages:

Species differ with regard to their requirements for flowing water during different life-stages. The work of Crass (1964), Gaigher (1969), Pienaar (1978), Kleynhans (1984), Bell-Cross and Minshull (1988), Skelton (1993), Russell (in prep) and Weeks *et al.* (1996) were consulted for information on habitat preferences. Three general groups were distinguished - species that never require flowing water during their life cycle, those that require flowing water during some part (i.e. for breeding purposes) and those that need flowing water during the total life cycle. Requirements were respectively rated as 1, 3 and 5.

Requirements for flowing water is related to habitat specialisation and preference, but is regarded as a separate entity which was included specifically due to the naturally highly variable and artificially easily impaired flow characteristics of South African rivers.

(d) Water quality requirements (requirement for unmodified water quality)::

Very little information on the water quality requirements of South African fish are available. Consequently, resort had to be made to the previously observed associations of certain fish species with perturbed and unperturbed water quality conditions. This can take the form of the association of fish species with different habitats in a variety of geographical areas, e.g. the preference of some species for fast flowing, turbulent, clear water would in natural or minimally developed catchments tend to be associated with habitats with unimpaired water quality conditions. Conversely, species able to survive in habitats (i.e., pools, which may even be stagnant) in catchments which are extensively developed and often polluted, would be surmised to be relatively tolerant to impaired water quality conditions. This approach is similar to that followed by Lyons *et al.* (1995) in information-scarce situations in Mexico. The general scoring procedure followed was to rate species with a relatively high water quality requirement as 1, those with a moderate requirement as 3, and those with a high requirement as 5.

Due to the lack of any detailed information, this approach must be seen as giving an indirect and relative indication of water quality requirements at its best.

SCORING CRITERIA
1-2=TOLERANT
2-3=MODERATELY TOLERANT
3-4=MODERATELY INTOLERANT
4-5=INTOLERANT

COVER PREFERENCES FOR SPECIES

These features are considered to provide fish with the necessary cover (e.g. refuge from high flow velocity, predators, high temperatures, etc.) to utilise a particular flow and depth class. The following features were included for assessment:

(1) Overhanging vegetation - thick vegetation overhanging water by approximately 0.3 m and not more than 0.1 m above the water surface (Wang *et al.* 1996).

(2) Undercut banks and root wads - banks overhanging water by approximately 0.3 m and not more than 0.1 m above the water surface (Wang *et al.* 1996).

(3) Stream substrate - the degree to which various substrate components (rocks, boulders, cobbles, gravel, sand, fine sediment and woody debris ("snags")) provide cover for fish were judged qualitatively. No detail assessment of the stream substrate and estimation of the contribution of individual components were attempted. The composition of the substrate was handled, therefore, in a descriptive manner.

(4) Aquatic macrophytes - submerged and emergent plants were included and a qualitative estimate made of the cover value for fish.

(5) Water column - some species use the extent of the water column as a form of cover (e.g., from aerial predators).

SCORING CRITERIA
0=NO PREFERENCE, IRRELEVANT
>0 -1= VERY LOW PREFERENCE -COINCIDENTAL?
>1-2 = LOW PREFERENCE
>2-3=MODERATE PREFERENCE
>3-4=HIGH PREFERENCE
>4-5=VERY HIGH PREFERENCE

TABLE : FRESHWATER SPECIES SCIENTIFIC NAME, ABBREVIATION AND COMMON NAME.

ABBREVIATION	SCIENTIFIC NAME	ENGLISH COMMON NAME
AAEN	*AWAOUS AENEOFUSCUS* (PETERS 1852)	FRESHWATER GOBY (M)
ABAR	*AUSTROGLANIS BARNARDI* (SKELTON, 1981)	BARNARD'S ROCK CATFISH
ABER	*ACANTHOPAGRUS BERDA* (FORSSKÅL, 1775)	RIVERBREAM (MS)
ABIC	*ANGUILLA BICOLOR BICOLOR* MCCLELLAND, 1844	SHORTFIN EEL
ABRE	*ATHERINA BREVICEPS* VALENCIENNES, 1835	CAPE SILVERSIDE
AGIL	*AUSTROGLANIS GILLI* (BARNARD, 1943)	CLANWILLIAM ROCK-CATFISH
AJOH	*APLOCHEILICHTHYS JOHNSTONI* (GÜNTHER, 1893)	JOHNSTON'S TOPMINNOW
AKAT	*APLOCHEILICHTHYS KATANGAE* (BOULENGER, 1912)	STRIPED TOPMINNOW
ALAB	*ANGUILLA BENGALENSIS LABIATA* PETERS, 1852	AFRICAN MOTTLED EEL
AMAR	*ANGUILLA MARMORATA* QUOY & GAIMARD 1824	GIANT MOTTLED EEL
AMOS	*ANGUILLA MOSSAMBICA* PETERS 1852	LONGFIN EEL
AMYA	*APLOCHEILICHTHYS MYAPOSAE* (BOULENGER, 1908)	NATAL TOPMINNOW
ANAT	*AMPHILIUS NATALENSIS* BOULENGER, 1917	NATAL MOUNTAIN CATFISH
ASCL	*AUSTROGLANIS SCLATERI* (BOULENGER, 1901)	ROCK-CATFISH
AURA	*AMPHILIUS URANOSCOPUS* (PFEFFER, 1889)	STARGAZER (MOUNTAIN CATFISH)
BAEN	*LABEOBARBUS AENEUS* (BURCHELL, 1822)	SMALLMOUTH YELLOWFISH
BAFR	*BARBUS AFROHAMILTONI* CRASS, 1960	HAMILTON'S BARB
BAMA	*BARBUS AMATOLICUS* SKELTON, 1990	AMATOLA BARB
BAND	*BARBUS ANDREWI* BARNARD, 1937	WHITEFISH
BANN	*BARBUS ANNECTENS* GILCHRIST & THOMPSON, 1917	BROADSTRIPED BARB
BANO	*BARBUS ANOPLUS* WEBER, 1897	CHUBBYHEAD BARB
BARG	*BARBUS ARGENTEUS* GÜNTHER, 1868	ROSEFIN BARB
BBIF	*BARBUS BIFRENATUS* FOWLER, 1935	HYPHEN BARB

ABBREVIATION	SCIENTIFIC NAME	ENGLISH COMMON NAME
BBRI	*BARBUS BREVIPINNIS* JUBB, 1966	SHORTFIN BARB
BCAL	*BARBUS CALIDUS* BARNARD, 1938	CLANWILLIAM REDFIN
BCAP	*BARBUS CAPENSIS* SMITH, 1841	CLANWILLIAM YELLOWFISH
BERU	*BARBUS ERUBESCENS* SKELTON, 1974	TWEE RIVER REDFIN
BEUT	*BARBUS EUTAENIA* BOULENGER, 1904	ORANGEFIN BARB
BGUR	*BARBUS GURNEYI* GÜNTHER, 1868	REDTAIL BARB
BHOS	*BARBUS HOSPES* BARNARD, 1938	NAMAQUA BARB
BIMB	*BRYCINUS IMBERI* (PETERS, 1852)	IMBERI
BKIM	*LABEOBARBUS KIMBERLEYENSIS* GILCHRIST & THOMPSON, 1913	LARGEMOUTH YELLOWFISH
BLAT	*BRYCINUS LATERALIS* (BOULENGER, 1900)	STRIPED ROBBER
BLIN	*BARBUS LINEOMACULATUS* BOULENGER, 1903	LINE-SPOTTED BARB
BMAR	*LABEOBARBUS MAREQUENSIS* SMITH, 1841	LARGESCALE YELLOWFISH
BMAT	*BARBUS MATTOZI* GUIMARAES, 1884	PAPERMOUTH
BMOT	*BARBUS MOTEBENSIS* STEINDACHNER, 1894	MARICO BARB
BNAT	*BARBUS NATALENSIS* CASTELNAU, 1861	SCALY
BNEE	*BARBUS NEEFI* GREENWOOD, 1962	SIDESPOT BARB
BPAL	*BARBUS PALLIDUS* SMITH, 1841	GOLDIE BARB
BPAU	*BARBUS PALUDINOSUS* PETERS, 1852	STRAIGHTFIN BARB
BPOL	*LABEOBARBUS POLYLEPIS* BOULENGER, 1907	SMALLSCALE YELLOWFISH
BRAD	*BARBUS RADIATUS* PETERS, 1853	BEIRA BARB
BSER	*BARBUS SERRA* PETERS, 1864	SAWFIN
BTOP	*BARBUS TOPPINI* BOULENGER, 1916	
BTRE	*BARBUS TREURENSIS* GROENEWALD, 1958	TREUR RIVER BARB
BTRI	*BARBUS TRIMACULATUS* PETERS, 1852	THREESPOT BARB
BTRV	*BARBUS TREVELYANI* GÜNTHER, 1877	

ABBREVIATION	SCIENTIFIC NAME	ENGLISH COMMON NAME
BVIV	*BARBUS VIVIPARUS* WEBER, 1897	BOWSTRIPE BARB
CANO	*CHILOGLANIS ANOTERUS* CRASS, 1960	PENNANT-TAIL SUCKERMOUTH (OR ROCK CATLET)
CAUR	*CARASSIUS AURATUS* (LINNAEUS, 1758)	GOLDFISH (EX)
CBIF	*CHILOGLANIS BIFURCUS* JUBB & LE ROUX, 1969	INCOMATI SUCKERMOUTH (OR ROCK CATLET)
CBRE	*CHETIA BREVIS* JUBB, 1968	ORANGE-FRINGED LARGEMOUTH
CCAR	*CYPRINUS CARPIO* LINNAEUS, 1758	CARP (EX)
CEMA	*CHILOGLANIS EMARGINATUS* JUBB & LE ROUX, 1969	PONGOLO SUCKERMOUTH (OR ROCK CATLET)
CFLA	*CHETIA FLAVIVENTRIS* TREWAVAS, 1961	CANARY KURPER
CGAR	*CLARIAS GARIEPINUS* (BURCHELL, 1822)	SHARPTOOTH CATFISH
CIDE	*CTENOPHARYNGODON IDELLA* (VALENCIENNES, 1844)	GRASS CARP (EX)
CMUL	*CTENOPOMA MULTISPINE* PETERS, 1844	MANYSPINED CLIMBING PERCH
CPAR	*CHILOGLANIS PARATUS* CRASS, 1960	SAWFIN SUCKERMOUTH (OR ROCK CATLET)
CPRE	*CHILOGLANIS PRETORIAE* VAN DER HORST, 1931	SHORTSPINE SUCKERMOUTH (OR ROCK CATLET)
CSWI	*CHILOGLANIS SWIERSTRAI* VAN DER HORST, 1931	LOWVELD SUCKERMOUTH (OR ROCK CATLET)
CTHE	*CLARIAS THEODORAE* WEBER, 1897	SNAKE CATFISH
GAES	*GILCHRISTELLA AESTUARIA* (GILCHRIST, 1913)	ESTUARINE ROUND-HERRING
GAFF	*GAMBUSIA AFFINIS* (BAIRD & GIRARD, 1853)	MOSQUITOFISH (EX)
GCAL	*GLOSSOGOBIUS CALLIDUS* SMITH, 1937	RIVER GOBY (M)
GGIU	*GLOSSOGOBIUS GIURIS* (HAMILTON-BUCHANAN, 1822)	TANK GOBY (M)
GZEB	*GALAXIAS ZEBRATUS* CASTELNAU, 1861	CAPE GALAXIAS
HANS	*HIPPOPOTAMYRUS ANSORGII* (BOULENGER,1905)	SLENDER STONEBASHER
HCAP	*HYPORHAMPHUS CAPENSIS* (THOMINOT, 1886)	CAPE HALFBEAK (MS)
HMOL	*HYPOPHTHALMICHTHYS MOLITRIX* (VALENCIENNES, 1844)	SILVER CARP (EX)
HVIT	*HYDROCYNUS VITTATUS* CASTELNAU, 1861	TIGERFISH

ABBREVIATION	SCIENTIFIC NAME	ENGLISH COMMON NAME
KAUR	*KNERIA AURICULATA* (PELLEGRIN, 1905)	SOUTHERN KNERIA
LCAP	*LABEO CAPENSIS* (SMITH, 1841)	ORANGE RIVER LABEO
LCON	*LABEO CONGORO* PETERS, 1852	PURPLE LABEO
LCYL	*LABEO CYLINDRICUS* PETERS, 1852	REDEYE LABEO
LMAC	*LEPOMIS MACROCHIRUS* RAFINESQUE, 1819	BLUEGILL SUNFISH (EX)
LMCR	*LIZA MACROLEPIS* (SMITH, 1846)	LARGE-SCALE MULLET (MS)
LMOL	*LABEO MOLYBDINUS* DU PLESSIS, 1963	LEADEN LABEO
LRIC	*LIZA RICHARDSONII* (SMITH, 1846)	SOUTHERN MULLET (MS)
LROS	*LABEO ROSAE* STEINDACHNER, 1894	REDNOSE LABEO
LRUB	*LABEO RUBROMACULATUS* GILCHRIST & THOMPSON, 1913	TUGELA LABEO
LRUD	*LABEO RUDDI* BOULENGER, 1907	SILVER LABEO
LSEE	*LABEO SEEBERI* GILCHRIST & THOMPSON, 1911	CLANWILLIAM SANDFISH
LUMB	*LABEO UMBRATUS* (SMITH, 1841)	MOGGEL
MACU	*MICRALESTES ACUTIDENS* (PETERS, 1852)	SILVER ROBBER
MARG	*MONODACTYLUS ARGENTEUS* (LINNAEUS, 1758)	NATAL MOONY (MS)
MBRA	*MICROPHIS BRACHYURUS* BLEEKER, 1853	OPOSSUM PIPEFISH (M)
MBRE	*MESOBOLA BREVIANALIS* (BOULENGER, 1908)	RIVER SARDINE
MCAP	*MYXUS CAPENSIS* (VALENCIENNES, 1836)	FRESHWATER MULLET (M)
MCEP	*MUGIL CEPHALUS* LINNAEUS, 1758	FLATHEAD MULLET (M)
MCYP	*MEGALOPS CYPRINOIDES* (BROUSSONET, 1782)	OXEYE TARPON
MDOL	*MICROPTERUS DOLOMIEU* LACEPÈDE, 1802	SMALLMOUTH BASS (EX)
MFAL	*MONODACTYLUS FALCIFORMIS* LACEPÈDE, 1801	CAPE MOONY (MS)
MFLU	*MICROPHIS FLUVIATILIS* (PETERS, 1852)	FRESHWATER PIPEFISH (M)

ABBREVIATION	SCIENTIFIC NAME	ENGLISH COMMON NAME
MMAC	*MARCUSENIUS MACROLEPIDOTUS* (PETERS, 1852)	BULLDOG
MPUN	*MICROPTERUS PUNCTULATUS* (RAFINESQUE, 1819)	SPOTTED BASS (EX)
MSAL	*MICROPTERUS SALMOIDES* (LACEPÈDE, 1802)	LARGEMOUTH BASS (EX)
NORT	*NOTHOBRANCHIUS ORTHONOTUS* (PETERS, 1844)	SPOTTED KILLIFISH
NRAC	*NOTHOBRANCHIUS RACHOVII* AHL, 1926	RAINBOW KILLIFISH
OAUR	*OREOCHROMIS AUREUS* (STEINDACHNER, 1864)	ISRAELI TILAPIA (EX)
OMAC	*OREOCHROMIS (NYASALAPIA) MACROCHIR* (BOULENGER, 1912)	GREENHEAD TILAPIA
OMOS	*OREOCHROMIS MOSSAMBICUS* (PETERS, 1852)	MOZAMBIQUE TILAPIA
OMYK	*ONCORHYNCHUS MYKISS* (WALBAUM, 1792)	RAINBOW TROUT (EX)
ONIL	*OREOCHROMIS NILOTICUS (LINNAEUS, 1758)*	NILE TILAPIA (EX)
OPER	*OPSARIDIUM PERINGUEYI* (GILCHRIST & THOMPSON, 1913)	SOUTHERN BARRED MINNOW
OPLA	*OREOCHROMIS PLACIDUS* (TREWAVAS, 1941)	BLACK TILAPIA
PAFE	*PSEUDOBARBUS AFER* (PETERS, 1864)	EASTERN CAPE REDFIN
PAMP	*PROTOPTERUS AMPHIBIUS* (PETERS, 1844)	EAST COAST LUNGFISH
PANN	*PROTOPTERUS ANNECTENS BRIENI* POLL,1961	LUNGFISH
PASP	*PSEUDOBARBUS ASPER* (BOULENGER, 1911)	SMALLSCALE REDFIN
PBUG	*PSEUDOBARBUS BURGI* (BOULENGER, 1911)	BERG RIVER REDFIN
PBUR	*PSEUDOBARBUS BURCHELLI* SMITH, 1841	BURCHELL'S REDFIN
PCAT	*PETROCEPHALUS CATOSTOMA* (GÜNTHER, 1866)	CHURCHILL
PFLU	*PERCA FLUVIATILIS* LINNAEUS, 1758	EUROPEAN PERCH (EX)
PPHI	*PSEUDOCRENILABRUS PHILANDER* (WEBER, 1897)	SOUTHERN MOUTHBROODER
PPHL	*PSEUDOBARBUS PHLEGETHON* (BARNARD, 1938)	FIERY REDFIN

ABBREVIATION	SCIENTIFIC NAME	ENGLISH COMMON NAME
PQUA	*PSEUDOBARBUS QUATHLAMBAE* (BARNARD, 1938)	DRAKENSBERG MINNOW
PRET	*POECILIA RETICULATA* PETERS, 1859	GUPPY (EX)
PTEN	*PSEUDOBARBUS TENUIS* (BARNARD, 1938)	SLENDER REDFIN
RDEW	*REDIGOBIUS DEWAALI* (WEBER, 1897)	CHECKED GOBY (M)
SBAI	*SANDELIA BAINSII* CASTELNAU, 1861	EASTERN CAPE ROCKY
SCAP	*SANDELIA CAPENSIS* (CUVIER, 1831)	CAPE KURPER
SFON	*SALVELINUS FONTINALIS* (MITCHILL, 1815)	BROOK CHARR (EX)
SINT	*SCHILBE INTERMEDIUS* RÜPPELL, 1832	SILVER CATFISH
SMER	*SERRANOCHROMIS MERIDIANUS* JUBB, 1967	LOWVELD LARGEMOUTH
SSIB	*SILHOUETTEA SIBAYI* FARQUHARSON, 1970	SIBAYI GOBY (M)
STRU	*SALMO TRUTTA* LINNAEUS, 1758	BROWN TROUT (EX)
SZAM	*SYNODONTIS ZAMBEZENSIS* PETERS, 1852	BROWN SQUEAKER
TREN	*TILAPIA RENDALLI* (BOULENGER, 1896)	REDBREAST TILAPIA
TSPA	*TILAPIA SPARRMANII* SMITH, 1840	BANDED TILAPIA
TTIN	*TINCA TINCA* (LINNAEUS, 1758)	TENCH (EX)
VNEL	*VARICORHINUS NELSPRUITENSIS* GILCHRIST & THOMPSON, 1911	INCOMATI CHISELMOUTH
XHEL	*XIPHOPHORUS HELLERI* HECKEL, 1848	SWORDTAIL (EX)

TABLE : FRESHWATER SPECIES PREFERENCES FOR SLOW-DEEP AND SLOW-SHALLOW HABITATS.

FLOW-DEPTH PREFERENCE RATINGS
0=NO PREFERENCE, IRRELEVANT
>0 -1= VERY LOW PREFERENCE -COINCIDENTAL?
>1-2 = LOW PREFERENCE
>2-3=MODERATE PREFERENCE
>3-4=HIGH PREFERENCE
>4-5=VERY HIGH PREFERENCE
CONFIDENCE RATINGS
1-2=LOW CONFIDENCE
>2-3=MODERATE CONFIDENCE
>3-4=HIGH CONFIDENCE
>4-5=VERY HIGH CONFIDENCE

SPECIES	SLOW-DEEP (<0.3 m/s; >0.5 m)				SLOW-SHALLOW (<0.3 m/s; <0.5 m)			
	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE RATING	AVERAGE CONFIDENCE	MINIMUM RATING	MAXIMUM RATING
AAEN	3.5	2.9	2.0	5.0	4.0	3.5	3.0	5.0
ABAR	2.0	4.0	2.0	2.0	3.0	4.0	3.0	3.0
ABER	4.5	4.4	3.0	5.0	3.0	2.9	3.0	3.0
ABIC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ABRE	4.0	4.0	4.0	4.0	2.5	3.0	1.0	4.0
AGIL	3.5	3.5	3.0	4.0	3.5	3.5	3.0	4.0
AJOH	3.3	3.0	2.0	5.0	4.0	3.7	3.0	5.0
AKAT	2.9	3.8	1.0	5.0	3.9	4.8	1.0	5.0
ALAB	4.6	4.4	2.0	5.0	0.4	4.4	0.0	2.0
AMAR	4.4	4.3	2.0	5.0	0.5	4.4	0.0	2.0
AMOS	3.4	4.2	2.0	5.0	1.1	3.9	0.0	3.0
AMYA	2.0	3.0	2.0	2.0	4.0	3.0	4.0	4.0
ANAT	0.2	5.0	0.0	1.0	0.5	5.0	0.0	3.0
ASCL	3.4	3.7	2.0	5.0	2.3	2.7	1.0	4.0
AURA	0.0	4.4	0.0	0.0	0.0	4.4	0.0	0.0
BAEN	3.5	3.3	3.0	4.0	2.5	3.7	2.0	4.0
BAFR	4.7	5.0	3.0	5.0	4.3	4.7	3.0	5.0
BAMA	0.0	0.0	0.0	0.0	4.0	3.0	4.0	4.0
BAND	3.7	3.3	3.0	4.0	3.0	4.0	2.0	4.0
BANN	5.0	4.7	5.0	5.0	2.3	3.9	1.0	3.0
BANO	4.1	4.2	2.5	5.0	4.3	4.1	3.0	5.0
BARG	1.6	4.0	0.0	3.0	1.5	3.9	0.0	3.0
BBIF	3.3	4.1	3.0	5.0	4.7	4.7	3.0	5.0
BBRI	3.3	3.9	1.0	5.0	4.3	4.1	3.0	5.0
BCAL	4.0	4.0	4.0	4.0	3.5	4.0	3.0	4.0
BCAP	4.0	4.0	4.0	4.0	3.5	4.0	3.0	4.0
BERU	4.0	4.0	4.0	4.0	2.0	4.0	1.0	3.0
BEUT	1.0	4.3	1.0	1.0	1.0	4.3	1.0	1.0
BGUR	3.0	3.0	3.0	3.0	4.0	3.0	4.0	4.0
BHOS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SPECIES	SLOW-DEEP (<0.3 m/s; >0.5 m)				SLOW-SHALLOW (<0.3 m/s; <0.5 m)			
	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE RATING	AVERAGE CONFIDENCE	MINIMUM RATING	MAXIMUM RATING
BIMB	4.7	4.8	3.0	5.0	2.6	4.4	0.0	3.0
BKIM	3.7	3.2	3.0	4.0	2.0	3.0	0.0	4.0
BLAT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BLIN	3.7	3.0	3.0	5.0	4.7	3.3	3.0	5.0
BMAR	4.4	4.8	2.5	5.0	3.4	4.4	1.0	5.0
BMAT	4.7	4.8	3.0	5.0	4.0	4.1	3.0	5.0
BMOT	3.0	4.4	3.0	3.0	4.7	4.7	3.0	5.0
BNAT	3.0	3.0	2.0	4.0	1.5	3.0	1.0	2.0
BNEE	3.3	4.4	3.0	5.0	4.7	4.7	3.5	5.0
BPAL	2.0	3.0	2.0	2.0	3.8	3.5	3.0	4.5
BPAU	3.9	4.6	2.0	5.0	3.9	4.6	1.0	5.0
BPOL	4.2	4.5	3.0	5.0	2.9	4.4	1.0	5.0
BRAD	4.7	4.7	3.0	5.0	5.0	5.0	5.0	5.0
BSER	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
BTOP	3.3	4.7	3.0	5.0	4.3	5.0	3.0	5.0
BTRE	4.7	4.7	3.0	5.0	3.0	4.7	3.0	3.0
BTRI	3.9	4.3	2.0	5.0	3.2	4.3	2.0	5.0
BTRV	0.0	0.0	0.0	0.0	3.0	4.0	3.0	3.0
BUNI	5.0	4.7	5.0	5.0	4.3	5.0	3.0	5.0
BVIV	2.1	3.8	0.0	5.0	4.8	4.1	4.0	5.0
CANO	0.0	5.0	0.0	0.0	0.6	5.0	0.0	3.0
CAUR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CBIF	0.0	4.7	0.0	0.0	0.0	5.0	0.0	0.0
CBRE	4.7	4.4	3.0	5.0	3.7	4.4	3.0	5.0
CCAR	4.7	4.5	4.0	5.0	3.2	4.2	1.0	5.0
CEMA	0.0	5.0	0.0	0.0	0.0	5.0	0.0	0.0
CFLA	4.7	4.4	3.0	5.0	3.7	4.4	3.0	5.0
CGAR	4.3	4.5	2.0	5.0	3.4	3.8	2.5	5.0
CIDE	5.0	5.0	5.0	5.0	1.7	3.6	0.0	3.0
CMUL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CPAR	1.5	4.7	0.0	3.0	2.7	4.4	1.0	3.0
CPRE	0.0	5.0	0.0	0.0	0.6	5.0	0.0	3.0
CSWI	0.0	5.0	0.0	0.0	2.7	4.1	1.0	3.0
CTHE	4.5	3.5	4.0	5.0	3.0	2.0	3.0	3.0
GAES	3.5	3.3	3.0	5.0	3.7	3.5	3.0	4.0
GAFF	1.5	3.7	0.0	5.0	4.6	4.8	3.0	5.0
GCAL	2.4	3.0	0.0	4.0	4.7	3.7	3.0	5.0
GGIU	2.4	3.1	0.0	4.0	4.6	3.6	3.0	5.0
GZEB	3.0	4.0	2.0	4.0	3.3	3.3	2.0	4.0
HANS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HCAP	0.0	0.0	0.0	0.0	2.0	1.0	2.0	2.0
HMOL	5.0	5.0	5.0	5.0	1.2	4.0	0.0	3.0
HVIT	4.7	4.8	2.8	5.0	0.7	4.4	0.0	3.0

SPECIES	SLOW-DEEP (<0.3 m/s; >0.5 m)				SLOW-SHALLOW (<0.3 m/s; <0.5 m)			
	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE RATING	AVERAGE CONFIDENCE	MINIMUM RATING	MAXIMUM RATING
KAUR	0.0	5.0	0.0	0.0	4.2	5.0	0.0	5.0
LCAP	4.2	3.5	3.5	5.0	3.0	3.5	1.9	4.0
LCON	5.0	4.4	5.0	5.0	0.0	5.0	0.0	0.0
LCYL	2.0	4.4	1.0	3.0	2.7	4.1	1.0	3.0
LMAC	4.6	4.4	4.0	5.0	3.9	4.5	3.0	5.0
LMCR	0.0	0.0	0.0	0.0	3.0	3.0	3.0	3.0
LMOL	3.7	4.4	2.0	5.0	1.5	4.5	0.0	3.0
LRIC	0.0	0.0	0.0	0.0	3.0	4.0	3.0	3.0
LROS	4.7	4.4	3.2	5.0	1.9	3.9	0.0	3.0
LRUB	5.0	0.0	5.0	5.0	2.0	0.0	2.0	2.0
LRUD	4.7	4.2	3.1	5.0	2.5	4.1	0.0	3.0
LSEE	4.0	4.0	4.0	4.0	4.0	3.0	4.0	4.0
LUMB	4.5	4.5	3.0	5.0	2.7	3.7	0.0	4.0
MACU	4.3	4.4	0.0	5.0	4.3	4.5	1.8	5.0
MARG	3.0	3.0	2.0	4.0	2.0	4.0	2.0	2.0
MBRA	4.0	4.0	4.0	4.0	2.0	4.0	2.0	2.0
MBRE	4.3	4.4	2.2	5.0	4.2	4.3	3.0	5.0
MCAP	3.8	4.0	2.0	5.0	2.7	4.0	1.0	4.0
MCEP	3.8	3.7	2.0	5.0	2.7	4.0	1.0	4.0
MCYP	3.5	3.0	3.0	4.0	0.0	4.0	0.0	0.0
MDOL	4.6	4.6	3.0	5.0	2.8	4.0	1.0	5.0
MFAL	3.0	4.0	3.0	3.0	3.5	3.5	3.0	4.0
MFLU	4.0	4.0	4.0	4.0	2.0	4.0	2.0	2.0
MMAC	4.2	4.4	3.0	5.0	3.7	4.0	2.2	5.0
MPUN	3.5	2.0	2.0	5.0	2.0	0.0	2.0	2.0
MSAL	4.5	4.3	3.0	5.0	3.0	4.0	1.0	5.0
NORT	0.2	4.4	0.0	1.0	5.0	5.0	5.0	5.0
NRAC	0.8	4.7	0.0	5.0	4.3	4.4	1.0	5.0
OAUR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OMAC	5.0	2.0	5.0	5.0	5.0	2.0	5.0	5.0
OMOS	4.6	4.2	3.5	5.0	3.8	4.3	2.0	5.0
OMYK	3.4	4.1	1.0	5.0	2.2	4.0	0.0	4.0
ONIL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OPER	3.3	4.7	1.0	5.0	2.4	4.7	0.0	5.0
OPLA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PAFE	4.0	4.0	4.0	4.0	3.5	3.5	3.0	4.0
PAMP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PANN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PASP	4.0	4.0	4.0	4.0	4.0	3.0	4.0	4.0
PBUG	3.0	3.3	2.0	4.0	4.0	4.0	4.0	4.0
PBUR	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
PCAT	4.7	4.7	3.0	5.0	4.3	4.7	3.0	5.0
PFLU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SPECIES	SLOW-DEEP (<0.3 m/s; >0.5 m)				SLOW-SHALLOW (<0.3 m/s; <0.5 m)			
	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE RATING	AVERAGE CONFIDENCE	MINIMUM RATING	MAXIMUM RATING
PPHI	2.6	4.4	0.0	5.0	4.3	4.7	1.0	5.0
PPHL	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
PQUA	0.0	0.0	0.0	0.0	4.0	5.0	4.0	4.0
PRET	3.0	2.0	3.0	3.0	5.0	2.0	5.0	5.0
PTEN	4.0	4.0	4.0	4.0	4.0	2.0	4.0	4.0
RDEW	4.0	4.0	4.0	4.0	3.0	2.0	2.0	4.0
SBAI	0.0	0.0	0.0	0.0	3.0	3.0	3.0	3.0
SCAP	2.5	4.0	1.0	4.0	3.7	3.7	3.0	4.0
SFON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SINT	5.0	4.4	5.0	5.0	1.5	4.1	0.0	3.0
SMER	4.3	4.7	3.0	5.0	3.3	4.7	3.0	5.0
SSIB	3.0	2.0	3.0	3.0	4.0	4.0	4.0	4.0
STRU	2.8	4.3	0.0	4.0	2.0	4.0	0.0	4.0
SZAM	5.0	4.4	5.0	5.0	2.3	4.1	1.0	3.0
TREN	4.9	4.4	4.0	5.0	3.9	4.4	3.0	5.0
TSPA	3.0	3.9	1.0	5.0	4.3	4.4	3.0	5.0
TTIN	4.0	3.5	4.0	4.0	3.0	3.0	3.0	3.0
VNEL	2.3	4.1	1.0	3.0	0.8	3.3	0.0	1.0
XHEL	0.7	4.7	0.0	1.0	5.0	5.0	5.0	5.0

TABLE : FRESHWATER SPECIES PREFERENCES FOR FAST-DEEP AND FAST-SHALLOW HABITATS.

FLOW-DEPTH PREFERENCE RATINGS
0=NO PREFERENCE, IRRELEVANT
>0 -1= VERY LOW PREFERENCE -COINCIDENTAL?
>1-2 = LOW PREFERENCE
>2-3=MODERATE PREFERENCE
>3-4=HIGH PREFERENCE
>4-5=VERY HIGH PREFERENCE
CONFIDENCE RATINGS
1-2=LOW CONFIDENCE
>2-3=MODERATE CONFIDENCE
>3-4=HIGH CONFIDENCE
>4-5=VERY HIGH CONFIDENCE

SPECIES	FAST-DEEP (>0.3 m/s; >0.3 m)				FAST-SHALLOW (>0.3 m/s; <0.3 m)			
	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING
AAEN	1.0	2.4	0.0	3.0	2.4	3.2	1.0	5.0
ABAR	3.0	4.0	3.0	3.0	5.0	4.0	5.0	5.0
ABER	0.0	5.0	0.0	0.0	0.0	5.0	0.0	0.0
ABIC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ABRE	2.0	4.0	2.0	2.0	2.0	4.0	2.0	2.0
AGIL	3.5	3.0	3.0	4.0	3.7	3.3	3.0	5.0
AJOH	0.0	3.3	0.0	0.0	0.0	3.3	0.0	0.0
AKAT	0.2	4.6	0.0	1.0	0.0	4.7	0.0	0.0
ALAB	2.9	4.1	1.0	5.0	2.6	4.4	0.0	5.0
AMAR	2.9	3.9	1.0	5.0	2.6	4.4	0.0	5.0
AMOS	3.4	4.1	1.0	5.0	3.3	4.1	0.0	5.0
AMYA	1.0	3.0	1.0	1.0	1.0	3.0	1.0	1.0
ANAT	5.0	5.0	5.0	5.0	4.7	4.4	3.0	5.0
ASCL	2.3	3.0	0.0	4.0	3.8	3.8	3.0	5.0
AURA	4.6	4.7	3.0	5.0	4.6	4.3	3.0	5.0
BAEN	3.5	3.0	2.0	5.0	4.0	3.7	3.0	5.0
BAFR	0.5	4.4	0.0	1.0	0.7	3.3	0.0	3.0
BAMA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAND	1.5	3.0	1.0	2.0	2.5	3.5	1.0	4.0
BANN	0.3	4.4	0.0	1.0	0.7	4.4	0.0	3.0
BANO	0.9	4.3	0.0	2.0	2.5	3.6	0.5	3.0
BARG	3.7	4.1	3.0	5.0	4.3	4.7	3.0	5.0
BBIF	0.7	4.4	0.0	1.0	0.8	4.3	0.0	1.0
BBRI	1.0	4.3	0.0	3.0	1.2	3.9	0.0	3.0
BCAL	1.5	4.0	1.0	2.0	3.0	4.0	2.0	4.0
BCAP	2.7	3.0	2.0	3.0	3.0	4.0	2.0	4.0
BERU	2.0	3.0	1.0	3.0	2.5	3.0	2.0	3.0
BEUT	4.3	5.0	3.0	5.0	4.7	5.0	3.0	5.0
BGUR	0.0	5.0	0.0	0.0	0.0	5.0	0.0	0.0
BHOS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SPECIES	FAST-DEEP (>0.3 m/s; >0.3 m)				FAST-SHALLOW (>0.3 m/s; <0.3 m)			
	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING
BIMB	2.0	3.9	1.0	5.0	1.1	3.4	0.0	3.0
BKIM	4.3	3.0	4.0	4.5	3.8	2.5	3.5	4.0
BLAT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BLIN	1.2	3.0	0.0	3.0	1.6	4.0	0.0	3.0
BMAR	4.1	4.6	3.0	5.0	4.4	4.7	3.0	5.0
BMAT	1.0	3.7	0.0	3.0	0.8	3.7	0.0	2.0
BMOT	0.2	4.0	0.0	1.0	1.3	3.6	1.0	3.0
BNAT	4.5	3.0	4.0	5.0	4.0	3.0	4.0	4.0
BNEE	1.0	4.0	0.0	3.0	1.7	3.7	0.0	4.0
BPAL	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0
BPAU	2.2	4.1	1.0	3.0	2.6	4.2	1.0	3.0
BPOL	3.7	4.7	3.0	5.0	4.3	4.7	3.0	5.0
BRAD	0.2	4.7	0.0	1.0	0.2	4.7	0.0	1.0
BSER	2.5	3.5	2.0	3.0	3.0	4.0	2.0	4.0
BTOP	0.0	5.0	0.0	0.0	0.0	5.0	0.0	0.0
BTRE	1.7	4.4	1.0	3.0	1.7	4.4	1.0	3.0
BTRI	2.3	3.8	1.0	3.0	2.7	3.8	1.0	3.5
BTRV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BUNI	0.9	3.9	0.0	2.5	1.3	4.0	0.0	4.0
BVIV	0.4	4.6	0.0	1.0	0.6	4.6	0.0	2.0
CANO	4.3	4.7	1.0	5.0	4.9	4.8	4.2	5.0
CAUR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CBIF	5.0	5.0	5.0	5.0	3.3	4.4	3.0	5.0
CBRE	0.2	4.3	0.0	1.0	0.2	4.3	0.0	1.0
CCAR	2.1	3.9	0.0	5.0	1.5	4.3	0.0	3.0
CEMA	0.0	5.0	0.0	0.0	0.0	5.0	0.0	0.0
CFLA	0.2	4.3	0.0	1.0	0.2	4.3	0.0	1.0
CGAR	1.2	4.0	0.0	3.0	0.8	4.3	0.0	2.0
CIDE	1.0	4.3	0.0	3.0	0.2	4.7	0.0	1.0
CMUL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CPAR	4.2	4.5	3.0	5.0	4.9	4.9	4.5	5.0
CPRE	4.3	4.6	1.0	5.0	4.9	4.6	4.5	5.0
CSWI	1.0	4.1	0.0	3.2	4.7	4.5	3.2	5.0
CTHE	2.0	3.5	2.0	2.0	1.0	3.5	1.0	1.0
GAES	2.0	3.0	2.0	2.0	1.0	3.0	0.0	2.0
GAFF	0.6	4.4	0.0	3.0	0.1	4.5	0.0	1.0
GCAL	1.1	4.4	0.0	3.0	2.4	3.8	1.0	3.0
GGIU	1.1	4.7	0.0	3.0	2.4	3.8	1.0	3.0
GZEB	1.0	3.5	1.0	1.0	3.0	4.0	2.0	4.0
HANS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HCAP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HMOL	1.0	4.7	0.0	3.0	0.2	4.7	0.0	1.0

SPECIES	FAST-DEEP (>0.3 m/s; >0.3 m)				FAST-SHALLOW (>0.3 m/s; <0.3 m)			
	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING
HVIT	3.6	4.8	3.0	5.0	0.8	3.7	0.0	3.0
KAUR	0.6	4.7	0.0	3.0	2.7	4.4	1.0	5.0
LCAP	3.3	3.0	3.0	3.5	2.5	3.5	2.0	3.5
LCON	5.0	4.7	5.0	5.0	0.2	5.0	0.0	1.0
LCYL	3.4	3.9	3.0	5.0	4.8	4.3	4.0	5.0
LMAC	0.7	4.6	0.0	3.0	0.7	4.7	0.0	3.0
LMCR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LMOL	3.3	4.0	1.0	5.0	4.3	3.9	3.0	5.0
LRIC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LROS	1.1	3.7	0.0	3.0	0.5	4.3	0.0	2.2
LRUB	3.9	3.0	3.8	4.0	3.0	0.0	3.0	3.0
LRUD	1.3	3.6	0.0	3.0	0.0	5.0	0.0	0.0
LSEE	3.0	3.5	3.0	3.0	3.0	3.5	3.0	3.0
LUMB	1.0	4.1	0.0	3.0	0.9	4.4	0.0	3.0
MACU	0.9	4.4	0.0	3.0	0.5	4.7	0.0	2.9
MARG	2.0	1.0	2.0	2.0	0.0	4.0	0.0	0.0
MBRA	1.0	5.0	1.0	1.0	0.0	5.0	0.0	0.0
MBRE	0.2	4.7	0.0	1.0	0.5	4.4	0.0	1.0
MCAP	2.3	3.5	1.0	4.0	1.7	3.5	1.0	3.0
MCEP	2.3	3.5	1.0	4.0	1.7	4.0	0.0	3.0
MCYP	1.0	1.0	1.0	1.0	0.0	5.0	0.0	0.0
MDOL	2.8	3.9	1.0	4.0	1.8	4.3	0.0	3.0
MFAL	2.0	4.0	2.0	2.0	2.0	4.0	2.0	2.0
MFLU	1.0	5.0	1.0	1.0	0.0	5.0	0.0	0.0
MMAC	2.1	3.5	1.0	3.0	1.2	3.6	0.0	3.0
MPUN	4.0	0.0	4.0	4.0	3.0	0.0	3.0	3.0
MSAL	0.8	4.4	0.0	4.0	0.8	4.4	0.0	3.0
NORT	0.0	5.0	0.0	0.0	0.0	5.0	0.0	0.0
NRAC	0.0	5.0	0.0	0.0	0.0	5.0	0.0	0.0
OAUR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OMAC	1.0	2.0	1.0	1.0	1.0	3.0	1.0	1.0
OMOS	1.4	3.7	0.0	3.0	0.8	3.5	0.0	2.0
OMYK	4.4	4.1	3.0	5.0	3.4	3.8	1.0	5.0
ONIL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OPER	3.2	4.4	0.0	5.0	3.0	4.1	1.0	5.0
OPLA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PAFE	2.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0
PAMP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PANN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PASP	2.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0
PBUG	2.0	3.5	2.0	2.0	2.5	3.5	2.0	3.0
PBUR	2.0	3.5	2.0	2.0	2.5	3.5	2.0	3.0

SPECIES	FAST-DEEP (>0.3 m/s; >0.3 m)				FAST-SHALLOW (>0.3 m/s; <0.3 m)			
	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING
PCAT	0.8	4.1	0.0	1.0	0.8	4.1	0.0	1.0
PFLU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PPHI	0.5	4.1	0.0	1.0	0.9	3.9	0.0	3.0
PPHL	1.5	4.0	1.0	2.0	2.5	4.0	2.0	3.0
PQUA	0.0	0.0	0.0	0.0	5.0	5.0	5.0	5.0
PRET	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0
PTEN	2.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0
RDEW	1.0	3.0	1.0	1.0	1.0	3.0	1.0	1.0
SBAI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SCAP	1.0	4.0	1.0	1.0	2.5	4.0	2.0	3.0
SFON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SINT	0.8	3.7	0.0	1.0	0.7	3.6	0.0	1.0
SMER	0.8	4.7	0.0	3.0	0.0	5.0	0.0	0.0
SSIB	1.0	4.0	1.0	1.0	0.0	4.0	0.0	0.0
STRU	4.7	4.3	3.0	5.0	3.9	4.1	1.0	5.0
SZAM	1.4	3.7	1.0	3.0	0.8	3.7	0.0	1.0
TREN	1.0	4.3	1.0	1.0	0.3	4.7	0.0	1.0
TSPA	0.9	3.9	0.0	2.0	1.5	3.9	0.0	3.0
TTIN	1.5	3.5	1.0	2.0	2.0	3.0	2.0	2.0
VNEL	5.0	4.7	5.0	5.0	5.0	4.7	5.0	5.0
XHEL	0.0	5.0	0.0	0.0	0.0	5.0	0.0	0.0

TABLE : FRESHWATER PREFERENCES FOR OVERHANGING VEGETATION AND BANK UNDERCUT COVER.

COVER PREFERENCES RATINGS
0=NO PREFERENCE, IRRELEVANT
>0 -1= VERY LOW PREFERENCE -COINCIDENTAL?
>1-2 = LOW PREFERENCE
>2-3=MODERATE PREFERENCE
>3-4=HIGH PREFERENCE
>4-5=VERY HIGH PREFERENCE
CONFIDENCE RATINGS
1-2=LOW CONFIDENCE
>2-3=MODERATE CONFIDENCE
>3-4=HIGH CONFIDENCE
>4-5=VERY HIGH CONFIDENCE

SPECIES	OVERHANGING VEGETATION				BANK UNDERCUT			
	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING
AAEN	3.7	3.2	0.0	5.0	1.6	3.0	0.0	3.0
ABAR	1.0	4.0	1.0	1.0	3.0	4.0	3.0	3.0
ABER	0.3	2.5	0.0	1.0	0.6	2.0	0.0	3.0
ABIC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ABRE	2.0	4.0	2.0	2.0	3.0	4.0	3.0	3.0
AGIL	1.5	3.5	1.0	2.0	3.5	3.5	3.0	4.0
AJOH	3.5	3.5	3.0	4.0	1.0	3.0	1.0	1.0
AKAT	4.6	4.8	3.0	5.0	1.0	3.8	0.0	3.0
ALAB	0.4	4.4	0.0	1.0	4.0	4.2	3.0	5.0
AMAR	0.4	4.4	0.0	1.0	3.9	4.0	3.0	5.0
AMOS	1.3	3.8	0.0	3.0	4.1	4.2	3.0	5.0
AMYA	4.0	4.0	4.0	4.0	2.0	2.0	2.0	2.0
ANAT	0.1	4.4	0.0	1.0	0.6	4.4	0.0	3.0
ASCL	0.3	3.4	0.0	1.0	3.5	3.8	1.0	5.0
AURA	0.1	4.9	0.0	1.0	0.4	4.4	0.0	3.0
BAEN	0.7	3.5	0.0	1.0	1.5	3.5	1.0	2.5
BAFR	2.2	3.0	0.0	3.0	0.0	4.7	0.0	0.0
BAMA	0.0	0.0	0.0	0.0	4.0	3.0	4.0	4.0
BAND	2.5	4.0	1.0	4.0	1.5	3.0	1.0	2.0
BANN	2.7	3.5	1.0	3.0	0.8	4.1	0.0	3.0
BANO	4.0	4.0	2.0	5.0	2.7	4.1	2.0	5.0
BARG	2.4	3.8	1.0	3.0	0.3	4.4	0.0	1.0
BBIF	4.4	4.3	3.0	5.0	2.7	4.3	1.0	3.0
BBRI	4.7	4.8	3.0	5.0	4.1	4.8	3.0	5.0
BCAL	3.0	4.0	2.0	4.0	3.0	4.0	2.0	4.0
BCAP	3.0	4.0	3.0	3.0	3.0	4.0	2.0	4.0
BERU	3.0	3.5	2.0	4.0	3.0	4.0	2.0	4.0
BEUT	4.1	4.5	3.0	5.0	4.4	4.8	3.0	5.0
BGUR	4.0	4.0	4.0	4.0	2.0	2.0	2.0	2.0
BHOS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BIMB	2.0	3.1	0.0	3.0	0.0	4.7	0.0	0.0
BKIM	0.0	2.5	0.0	0.0	0.0	2.0	0.0	0.0
BLAT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SPECIES	OVERHANGING VEGETATION				BANK UNDERCUT			

	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING
BLIN	1.2	3.0	0.0	3.0	3.0	2.8	1.0	5.0
BMAR	2.1	3.4	1.0	3.0	2.7	4.0	1.0	5.0
BMAT	1.3	3.6	0.0	5.0	1.2	4.4	0.0	3.0
BMOT	4.7	4.5	3.0	5.0	4.4	4.5	3.0	5.0
BNAT	2.0	3.0	2.0	2.0	2.0	1.0	2.0	2.0
BNEE	3.9	3.9	3.0	5.0	3.3	3.8	1.0	5.0
BPAL	2.8	3.5	1.0	4.5	2.0	3.0	2.0	2.0
BPAU	4.2	4.4	3.0	5.0	2.4	3.6	1.0	3.0
BPOL	1.0	3.6	0.0	3.0	1.6	4.3	1.0	3.0
BRAD	4.7	4.3	3.0	5.0	3.0	3.8	3.0	3.0
BSER	3.5	4.0	3.0	4.0	3.0	4.0	2.0	4.0
BTOP	4.7	4.5	3.0	5.0	0.3	4.1	0.0	1.0
BTRE	2.1	4.8	1.0	3.0	0.5	4.4	0.0	1.0
BTRI	3.9	4.5	2.0	5.0	2.6	4.4	0.0	3.0
BTRV	0.0	0.0	0.0	0.0	4.0	3.0	4.0	4.0
BUNI	4.6	4.1	1.5	5.0	2.7	3.8	1.0	3.0
BVIV	4.9	4.6	4.0	5.0	2.1	3.0	1.0	5.0
CANO	0.0	4.5	0.0	0.0	0.1	4.3	0.0	1.0
CAUR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CBIF	0.0	4.7	0.0	0.0	0.0	4.7	0.0	0.0
CBRE	4.7	4.5	3.0	5.0	0.7	3.9	0.0	3.0
CCAR	2.7	4.0	1.0	3.0	3.0	4.0	0.0	5.0
CEMA	0.0	4.7	0.0	0.0	0.0	4.7	0.0	0.0
CFLA	4.7	4.5	3.0	5.0	0.7	3.9	0.0	3.0
CGAR	2.8	4.0	1.0	5.0	2.9	3.9	1.0	5.0
CIDE	2.1	3.3	1.0	5.0	0.7	4.1	0.0	3.0
CMUL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CPAR	0.1	4.1	0.0	1.0	0.1	4.4	0.0	1.0
CPRE	0.0	4.4	0.0	0.0	0.1	4.2	0.0	1.0
CSWI	0.0	3.8	0.0	0.0	0.0	4.4	0.0	0.0
CTHE	3.5	3.0	3.0	4.0	3.0	2.5	2.0	4.0
GAES	1.0	4.0	1.0	1.0	1.0	4.0	1.0	1.0
GAFF	4.6	4.7	3.0	5.0	0.3	4.5	0.0	1.0
GCAL	2.2	4.0	0.0	3.0	0.3	4.4	0.0	1.0
GGIU	2.2	3.9	0.0	3.0	0.4	4.3	0.0	1.0
GZEB	4.0	4.0	4.0	4.0	3.0	4.0	3.0	3.0
HANS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HCAP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HMOL	0.0	5.0	0.0	0.0	0.0	5.0	0.0	0.0
HVIT	3.4	4.2	0.0	5.0	1.8	3.1	0.0	3.0
KAUR	4.7	4.3	3.0	5.0	0.9	4.0	0.0	1.0
LCAP	0.5	3.0	0.0	1.0	2.0	3.0	0.0	2.0
LCON	0.2	5.0	0.0	1.0	0.2	5.0	0.0	1.0
LCYL	0.1	4.6	0.0	1.0	0.3	5.0	0.0	1.0
LMAC	4.0	4.3	3.0	5.0	2.7	3.5	1.0	5.0
SPECIES	OVERHANGING VEGETATION				BANK UNDERCUT			

	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING
LMCR	1.0	5.0	1.0	1.0	2.0	5.0	2.0	2.0
LMOL	0.4	4.6	0.0	2.0	0.4	4.6	0.0	2.0
LRIC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LROS	0.0	5.0	0.0	0.0	0.0	5.0	0.0	0.0
LRUB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LRUD	0.0	5.0	0.0	0.0	0.0	5.0	0.0	0.0
LSEE	2.0	3.5	2.0	2.0	2.5	3.5	2.0	3.0
LUMB	0.6	4.6	0.0	2.0	0.1	4.6	0.0	2.0
MACU	3.1	4.2	0.0	5.0	0.1	4.6	0.0	1.0
MARG	4.0	2.0	4.0	4.0	4.0	2.0	4.0	4.0
MBRA	2.0	4.0	2.0	2.0	1.0	4.0	1.0	1.0
MBRE	1.8	4.3	0.0	3.5	0.5	5.0	0.0	3.0
MCAP	0.7	4.5	0.0	1.0	0.7	4.5	0.0	1.0
MCEP	1.0	4.5	0.0	2.0	0.7	4.5	0.0	1.0
MCYP	1.0	4.0	1.0	1.0	1.0	4.0	1.0	1.0
MDOL	2.9	4.2	1.0	5.0	3.4	4.2	1.0	5.0
MFAL	2.0	4.0	2.0	2.0	3.0	4.0	3.0	3.0
MFLU	2.0	4.0	2.0	2.0	1.0	4.0	1.0	1.0
MMAC	3.8	4.4	2.0	5.0	5.0	4.5	4.9	5.0
MPUN	1.0	0.0	1.0	1.0	3.0	0.0	3.0	3.0
MSAL	3.1	4.3	1.0	5.0	3.0	4.1	1.0	5.0
NORT	4.7	5.0	3.0	5.0	0.0	4.3	0.0	0.0
NRAC	4.7	5.0	3.0	5.0	0.0	4.3	0.0	0.0
OAUR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OMAC	0.0	5.0	0.0	0.0	3.0	5.0	0.0	0.0
OMOS	3.0	4.1	1.0	5.0	1.9	3.9	1.0	4.0
OMYK	1.8	3.8	0.0	4.0	2.2	3.9	0.0	4.0
ONIL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OPER	1.9	3.8	1.0	3.0	0.5	4.1	0.0	1.0
OPLA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PAFE	4.0	3.0	4.0	4.0	4.0	3.0	4.0	4.0
PAMP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PANN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PASP	3.0	3.0	3.0	3.0	4.0	3.0	4.0	4.0
PBUG	3.0	3.5	2.0	4.0	3.0	4.0	3.0	3.0
PBUR	3.0	4.0	2.0	4.0	2.5	4.0	2.0	3.0
PCAT	3.3	4.5	3.0	5.0	5.0	5.0	5.0	5.0
PFLU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PPHI	4.5	4.7	3.0	5.0	3.2	4.4	1.0	5.0
PPHL	3.0	3.5	2.0	4.0	3.5	4.0	1.0	4.0
PQUA	2.0	4.0	2.0	2.0	3.0	4.0	3.0	3.0
PRET	5.0	2.0	5.0	5.0	1.0	2.0	1.0	1.0
PTEN	4.0	4.0	4.0	4.0	3.0	4.0	3.0	3.0
RDEW	3.0	1.0	3.0	3.0	2.0	2.0	2.0	2.0
SBAI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SPECIES	OVERHANGING VEGETATION				BANK UNDERCUT			

	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING
SCAP	3.0	4.0	2.0	4.0	3.0	3.7	2.0	4.0
SFON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SINT	2.3	4.4	1.0	3.0	1.2	3.1	0.0	3.0
SMER	4.7	4.5	3.0	5.0	1.4	3.8	0.0	3.0
SSIB	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
STRU	1.8	4.1	0.0	4.0	2.3	4.2	0.0	4.0
SZAM	1.5	4.1	0.0	3.0	5.0	4.8	5.0	5.0
TREN	4.3	4.6	3.0	5.0	1.8	3.9	1.0	3.0
TSPA	4.5	4.4	3.0	5.0	1.9	4.1	0.0	4.0
TTIN	3.0	2.5	2.0	4.0	3.0	2.5	2.0	4.0
VNEL	0.8	4.1	0.0	3.0	1.9	4.0	1.0	3.0
XHEL	5.0	4.8	5.0	5.0	0.9	4.5	0.0	3.0

TABLE : FRESHWATER PREFERENCES FOR SUBSTRATE AND AQUATIC MACROPHYTE COVER.

COVER PREFERENCES RATINGS
0=NO PREFERENCE, IRRELEVANT
>0 -1= VERY LOW PREFERENCE -COINCIDENTAL?
>1-2 = LOW PREFERENCE
>2-3=MODERATE PREFERENCE
>3-4=HIGH PREFERENCE
>4-5=VERY HIGH PREFERENCE
CONFIDENCE RATINGS
1-2=LOW CONFIDENCE
>2-3=MODERATE CONFIDENCE
>3-4=HIGH CONFIDENCE
>4-5=VERY HIGH CONFIDENCE

SPECIES	SUBSTRATE				AQUATIC MACROPHYTES			
	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING
AAEN	4.9	4.0	4.0	5.0	0.3	4.0	0.0	3.0
ABAR	5.0	4.0	5.0	5.0	2.0	4.0	2.0	2.0
ABER	0.9	2.0	0.0	3.0	0.6	2.4	0.0	4.0
ABIC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ABRE	4.0	4.0	4.0	4.0	5.0	4.0	5.0	5.0
AGIL	4.7	3.3	4.0	5.0	1.5	3.5	1.0	2.0
AJOH	2.0	3.5	1.0	3.0	3.0	3.2	3.0	3.0
AKAT	0.4	4.8	0.0	1.0	3.9	4.1	1.0	5.0
ALAB	4.2	4.4	3.0	5.0	0.8	4.4	0.0	4.0
AMAR	4.2	4.4	3.0	5.0	0.8	4.4	0.0	4.0
AMOS	4.9	4.7	4.0	5.0	1.4	4.1	0.0	5.0
AMYA	1.0	3.0	1.0	1.0	3.0	1.0	3.0	3.0
ANAT	5.0	4.5	5.0	5.0	0.0	4.7	0.0	0.0
ASCL	4.4	3.9	3.0	5.0	0.1	3.4	0.0	1.0
AURA	5.0	4.8	5.0	5.0	0.0	4.6	0.0	0.0
BAEN	4.0	4.0	4.0	4.0	2.0	4.0	1.0	3.0
BAFR	0.0	4.7	0.0	0.0	1.4	4.1	0.0	3.0
BAMA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAND	4.5	4.0	4.0	5.0	3.5	4.0	3.0	4.0
BANN	1.3	4.4	0.0	3.0	0.9	3.3	0.0	3.0
BANO	2.3	4.3	0.0	3.0	3.2	4.3	0.0	5.0
BARG	5.0	4.5	5.0	5.0	0.0	4.7	0.0	0.0
BBIF	2.7	4.5	1.0	5.0	1.6	4.0	1.0	3.0
BBRI	1.7	3.8	0.0	3.0	0.0	5.0	0.0	0.0
BCAL	4.0	4.0	4.0	4.0	3.0	3.5	2.0	4.0
BCAP	4.0	4.0	4.0	4.0	3.5	4.0	3.0	4.0
BERU	4.0	4.0	4.0	4.0	3.5	4.0	3.0	4.0
BEUT	4.1	4.8	3.0	5.0	0.2	5.0	0.0	1.0
BGUR	1.0	3.0	1.0	1.0	1.0	1.0	1.0	1.0
BHOS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BIMB	0.4	4.4	0.0	3.0	1.4	3.3	0.0	3.0
BKIM	1.8	2.5	0.0	3.5	0.0	2.5	0.0	0.0
BLAT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SPECIES	SUBSTRATE				AQUATIC MACROPHYTES			

	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING
BLIN	3.9	3.0	1.0	5.0	0.5	4.4	0.0	3.0
BMAR	4.5	4.9	3.0	5.0	0.2	4.7	0.0	1.0
BMAT	4.1	4.5	3.0	5.0	0.7	4.0	0.0	1.0
BMOT	3.0	3.8	3.0	3.0	0.3	4.1	0.0	1.0
BNAT	3.5	3.0	3.0	4.0	1.0	1.0	1.0	1.0
BNEE	4.4	4.3	3.0	5.0	0.5	4.5	0.0	3.5
BPAL	3.5	2.5	3.0	4.0	2.3	3.0	1.0	3.5
BPAU	1.9	3.6	1.0	3.0	3.6	4.2	0.0	5.0
BPOL	5.0	5.0	5.0	5.0	0.0	5.0	0.0	0.0
BRAD	0.7	4.0	0.0	3.0	2.7	4.3	1.0	3.0
BSER	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
BTOP	0.7	3.6	0.0	1.0	1.9	3.8	1.0	3.0
BTRE	5.0	5.0	5.0	5.0	0.2	4.4	0.0	1.0
BTRI	2.3	3.9	0.0	3.5	2.8	3.5	1.0	5.0
BTRV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BUNI	2.9	4.3	1.0	4.0	1.3	3.0	1.0	3.0
BVIV	1.5	3.5	0.0	5.0	3.2	3.7	1.0	5.0
CANO	4.9	4.7	4.2	5.0	0.0	4.8	0.0	0.0
CAUR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CBIF	5.0	4.8	5.0	5.0	0.0	5.0	0.0	0.0
CBRE	1.5	4.1	0.0	5.0	2.6	4.5	0.0	3.0
CCAR	3.0	4.0	1.0	5.0	2.6	4.0	0.0	5.0
CEMA	0.0	5.0	0.0	0.0	0.0	5.0	0.0	0.0
CFLA	0.7	4.1	0.0	3.0	3.3	4.5	3.0	5.0
CGAR	2.8	4.1	1.0	5.0	3.0	3.7	1.0	5.0
CIDE	0.0	4.7	0.0	0.0	3.6	4.3	3.0	5.0
CMUL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CPAR	4.9	4.6	4.1	5.0	0.0	4.6	0.0	0.0
CPRE	4.9	4.6	4.1	5.0	0.0	4.6	0.0	0.0
CSWI	4.9	4.6	4.1	5.0	0.0	4.6	0.0	0.0
CTHE	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0
GAES	1.0	4.0	0.0	2.0	2.3	3.5	1.0	5.0
GAFF	0.3	4.5	0.0	2.0	3.7	4.5	3.0	5.0
GCAL	4.9	4.1	4.0	5.0	0.3	4.8	0.0	2.0
GGIU	4.9	4.1	4.0	5.0	0.3	4.8	0.0	1.0
GZEB	3.5	4.0	3.0	4.0	4.5	4.0	4.0	5.0
HANS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HCAP	0.0	0.0	0.0	0.0	3.0	1.0	3.0	3.0
HMOL	0.0	5.0	0.0	0.0	0.0	5.0	0.0	0.0
HVIT	0.6	4.1	0.0	2.0	2.1	3.3	0.0	3.0
KAUR	3.6	4.0	3.0	5.0	0.0	4.7	0.0	0.0
LCAP	4.2	3.5	3.0	5.0	1.5	3.0	0.0	3.0
LCON	5.0	4.8	5.0	5.0	0.0	5.0	0.0	0.0
LCYL	4.9	4.7	4.2	5.0	0.0	5.0	0.0	0.0
LMAC	2.1	3.7	0.0	4.0	4.2	3.8	3.0	5.0
SPECIES	SUBSTRATE				AQUATIC MACROPHYTES			

	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING
LMCR	3.0	3.0	3.0	3.0	1.0	5.0	1.0	1.0
LMOL	4.7	4.5	3.0	5.0	0.1	4.6	0.0	1.0
LRIC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LROS	5.0	4.8	5.0	5.0	0.0	5.0	0.0	0.0
LRUB	5.0	0.0	5.0	5.0	0.0	0.0	0.0	0.0
LRUD	4.7	4.5	3.0	5.0	0.0	5.0	0.0	0.0
LSEE	4.5	3.5	4.0	5.0	3.5	3.5	3.0	4.0
LUMB	4.2	3.8	2.0	5.0	0.8	4.5	0.0	3.0
MACU	0.9	4.5	0.0	4.0	1.3	3.6	0.0	3.0
MARG	1.0	4.0	1.0	1.0	4.0	3.0	4.0	4.0
MBRA	0.0	4.0	0.0	0.0	4.0	4.0	4.0	4.0
MBRE	0.7	3.3	0.0	1.0	1.0	4.8	0.0	3.0
MCAP	2.7	3.5	1.0	4.0	1.7	4.5	0.0	4.0
MCEP	2.7	3.5	1.0	4.0	1.7	4.5	0.0	4.0
MCYP	1.0	3.0	1.0	1.0	1.0	3.0	1.0	1.0
MDOL	3.6	4.4	2.0	5.0	3.2	4.0	2.0	5.0
MFAL	3.0	4.0	3.0	3.0	3.0	2.5	2.0	4.0
MFLU	0.0	4.0	0.0	0.0	4.0	4.0	4.0	4.0
MMAC	2.3	3.4	1.0	5.0	1.4	3.2	0.0	3.0
MPUN	4.0	0.0	4.0	4.0	1.0	0.0	1.0	1.0
MSAL	3.1	4.2	2.0	4.0	3.2	4.3	1.0	5.0
NORT	0.8	5.0	0.0	5.0	4.7	5.0	3.0	5.0
NRAC	0.8	5.0	0.0	5.0	4.7	5.0	3.0	5.0
OAUR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OMAC	0.0	5.0	0.0	0.0	0.0	3.0	0.0	0.0
OMOS	2.1	4.0	1.0	4.0	2.8	3.8	1.0	4.0
OMYK	4.7	4.1	4.0	5.0	0.9	4.3	0.0	4.0
ONIL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OPER	2.4	3.5	1.0	3.0	0.2	4.7	0.0	1.0
OPLA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PAFE	4.0	3.0	4.0	4.0	4.0	3.0	4.0	4.0
PAMP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PANN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PASP	4.0	3.0	4.0	4.0	4.0	3.0	4.0	4.0
PBUG	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
PBUR	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
PCAT	1.1	4.3	0.0	3.0	1.0	3.5	0.0	3.0
PFLU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PPHI	1.9	3.9	1.0	5.0	2.9	3.9	1.0	5.0
PPHL	3.0	3.7	1.0	4.0	2.7	3.7	1.0	4.0
PQUA	4.0	4.0	4.0	4.0	2.0	4.0	2.0	2.0
PRET	0.0	2.0	0.0	0.0	3.0	3.0	3.0	3.0
PTEN	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
RDEW	2.5	1.0	2.0	3.0	4.0	4.0	4.0	4.0
SBAI	4.0	4.0	4.0	4.0	0.0	0.0	0.0	0.0
SPECIES	SUBSTRATE				AQUATIC MACROPHYTES			

	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING
SCAP	3.5	4.0	3.0	4.0	4.5	4.0	4.0	5.0
SFON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SINT	0.2	5.0	0.0	1.0	1.7	3.9	1.0	3.0
SMER	1.0	4.4	0.0	3.0	3.0	4.0	1.0	5.0
SSIB	5.0	4.0	5.0	5.0	1.0	3.0	1.0	1.0
STRU	4.8	4.2	4.0	5.0	0.7	4.4	0.0	2.0
SZAM	2.7	4.3	1.0	5.0	1.3	3.8	0.0	3.0
TREN	1.4	4.3	0.0	3.0	4.1	4.4	2.0	5.0
TSPA	2.5	3.8	0.0	4.0	3.6	4.3	1.0	5.0
TTIN	3.5	2.5	3.0	4.0	4.5	3.5	4.0	5.0
VNEL	5.0	4.8	5.0	5.0	0.2	4.4	0.0	1.0
XHEL	0.2	5.0	0.0	1.0	3.9	4.5	3.0	5.0

TABLE : FRESHWATER PREFERENCES FOR WATER COLUMN COVER.

COVER PREFERENCES RATINGS
0=NO PREFERENCE, IRRELEVANT
>0 -1= VERY LOW PREFERENCE -COINCIDENTAL?
>1-2 = LOW PREFERENCE
>2-3=MODERATE PREFERENCE
>3-4=HIGH PREFERENCE
>4-5=VERY HIGH PREFERENCE
CONFIDENCE RATINGS
1-2=LOW CONFIDENCE
>2-3=MODERATE CONFIDENCE
>3-4=HIGH CONFIDENCE
>4-5=VERY HIGH CONFIDENCE

SPECIES	WATER COLUMN			
	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING
AAEN	0.3	4.9	0.0	1.0
ABAR	2.0	4.0	2.0	2.0
ABER	3.8	3.1	0.0	5.0
ABIC	0.0	0.0	0.0	0.0
ABRE	5.0	4.0	5.0	5.0
AGIL	2.0	3.5	1.0	3.0
AJOH	3.0	3.0	3.0	3.0
AKAT	0.9	4.3	0.0	3.0
ALAB	0.5	4.5	0.0	3.0
AMAR	0.6	4.5	0.0	3.0
AMOS	0.5	4.5	0.0	3.0
AMYA	3.0	3.0	3.0	3.0
ANAT	0.0	4.7	0.0	0.0
ASCL	0.9	3.1	0.0	3.0
AURA	0.0	4.8	0.0	0.0
BAEN	4.0	3.3	3.0	5.0
BAFR	4.0	3.5	3.0	5.0
BAMA	0.0	0.0	0.0	0.0
BAND	2.5	4.0	1.0	4.0
BANN	4.7	4.3	3.0	5.0
BANO	1.1	4.6	0.0	5.0
BARG	0.6	3.5	0.0	1.0
BBIF	0.0	5.0	0.0	0.0
BBRI	0.0	5.0	0.0	0.0
BCAL	3.5	4.0	3.0	4.0
BCAP	3.3	3.3	3.0	4.0
BERU	4.0	4.0	4.0	4.0
BEUT	0.2	4.4	0.0	1.0
BGUR	3.0	3.0	3.0	3.0
BHOS	0.0	0.0	0.0	0.0
BIMB	4.7	4.4	2.5	5.0
BKIM	3.3	2.5	3.0	4.0
BLAT	0.0	0.0	0.0	0.0
BLIN	0.0	4.7	0.0	0.0
SPECIES	WATER COLUMN			

	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING
BMAR	4.1	4.0	2.5	5.0
BMAT	4.2	4.8	0.0	5.0
BMOT	0.0	5.0	0.0	0.0
BNAT	3.5	3.0	2.0	5.0
BNEE	0.2	5.0	0.0	1.0
BPAL	1.0	3.0	1.0	1.0
BPAU	3.5	4.2	1.0	5.0
BPOL	3.6	4.8	3.0	5.0
BRAD	2.7	4.0	1.0	5.0
BSER	4.0	4.0	4.0	4.0
BTOP	0.5	4.7	0.0	3.0
BTRE	1.6	2.8	1.0	3.0
BTRI	2.8	4.1	1.0	3.0
BTRV	0.0	0.0	0.0	0.0
BUNI	2.2	3.2	1.0	3.0
BVIV	0.3	4.3	0.0	2.0
CANO	0.1	4.8	0.0	1.0
CAUR	0.0	0.0	0.0	0.0
CBIF	0.0	5.0	0.0	0.0
CBRE	1.1	2.5	0.0	3.0
CCAR	3.0	3.6	1.0	4.0
CEMA	0.0	5.0	0.0	0.0
CFLA	1.1	2.5	0.0	3.0
CGAR	2.6	3.5	1.0	5.0
CIDE	4.1	3.8	3.0	5.0
CMUL	0.0	0.0	0.0	0.0
CPAR	0.0	4.6	0.0	0.0
CPRE	0.0	4.6	0.0	0.0
CSWI	0.0	4.6	0.0	0.0
CTHE	1.0	4.0	1.0	1.0
GAES	4.5	3.7	4.0	5.0
GAFF	0.6	4.8	0.0	4.0
GCAL	0.3	4.9	0.0	1.0
GGIU	0.1	4.9	0.0	1.0
GZEB	2.0	4.0	2.0	2.0
HANS	0.0	0.0	0.0	0.0
HCAP	0.0	0.0	0.0	0.0
HMOL	5.0	4.8	5.0	5.0
HVIT	4.9	4.6	4.2	5.0
KAUR	0.0	4.7	0.0	0.0
LCAP	3.2	3.0	2.0	4.0
LCON	3.4	4.5	0.0	5.0
LCYL	0.4	4.8	0.0	1.5
LMAC	1.1	4.4	0.0	3.0
LMCR	3.0	3.0	3.0	3.0
SPECIES	WATER COLUMN			

	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING
LMOL	1.4	3.8	0.0	3.5
LRIC	0.0	0.0	0.0	0.0
LROS	1.8	3.4	1.0	3.5
LRUB	2.8	2.5	2.0	3.5
LRUD	2.1	3.6	1.0	5.0
LSEE	3.0	4.0	2.0	4.0
LUMB	2.5	3.3	1.0	5.0
MACU	4.0	4.4	1.0	5.0
MARG	4.0	3.0	4.0	4.0
MBRA	1.0	1.0	1.0	1.0
MBRE	5.0	4.8	5.0	5.0
MCAP	3.8	3.3	3.0	5.0
MCEP	3.8	3.3	3.0	5.0
MCYP	4.0	4.0	4.0	4.0
MDOL	1.7	4.8	0.0	4.0
MFAL	1.0	4.0	1.0	1.0
MFLU	1.0	1.0	1.0	1.0
MMAC	0.6	4.5	0.0	3.0
MPUN	4.0	0.0	4.0	4.0
MSAL	1.7	4.6	0.0	4.0
NORT	0.0	5.0	0.0	0.0
NRAC	0.0	5.0	0.0	0.0
OAUR	0.0	0.0	0.0	0.0
OMAC	0.0	5.0	0.0	0.0
OMOS	3.9	4.1	2.0	5.0
OMYK	2.2	3.5	0.0	5.0
ONIL	0.0	0.0	0.0	0.0
OPER	4.4	4.5	3.0	5.0
OPLA	0.0	0.0	0.0	0.0
PAFE	3.0	3.0	3.0	3.0
PAMP	0.0	0.0	0.0	0.0
PANN	0.0	0.0	0.0	0.0
PASP	3.0	3.0	3.0	3.0
PBUG	3.0	4.0	3.0	3.0
PBUR	3.0	4.0	3.0	3.0
PCAT	0.0	5.0	0.0	0.0
PFLU	0.0	0.0	0.0	0.0
PPHI	0.3	4.6	0.0	2.0
PPHL	4.0	3.7	3.0	5.0
PQUA	4.0	4.0	4.0	4.0
PRET	3.0	2.0	3.0	3.0
PTEN	3.0	4.0	3.0	3.0
RDEW	2.0	1.0	2.0	2.0
SBAI	0.0	0.0	0.0	0.0
SCAP	2.5	4.0	1.0	4.0
SPECIES	WATER COLUMN			

	AVERAGE RATING	AVERAGE CONFIDENCE RATING	MINIMUM RATING	MAXIMUM RATING
SFON	0.0	0.0	0.0	0.0
SINT	4.7	4.7	3.0	5.0
SMER	0.5	4.7	0.0	3.0
SSIB	1.0	4.0	3.0	3.0
STRU	2.0	3.3	0.0	5.0
SZAM	0.8	5.0	0.0	5.0
TREN	1.0	4.1	0.0	3.0
TSPA	1.1	4.4	0.0	3.0
TTIN	3.0	3.0	2.0	4.0
VNEL	0.7	4.7	0.0	3.0
XHEL	0.0	5.0	0.0	0.0

TABLE : FRESHWATER SPECIES TROPHIC AND HABITAT SPECIALIZATION RATINGS.

INTOLERANCE RATINGS
1-2=TOLERANT
>2-3=MODERATELY TOLERANT
>3-4=MODERATELY INTOLERANT
>4-5=INTOLERANT
CONFIDENCE RATINGS
1-2=LOW CONFIDENCE
>2-3=MODERATE CONFIDENCE
>3-4=HIGH CONFIDENCE
>4-5=VERY HIGH CONFIDENCE

SPECIES	TROPHIC SPECIALIZATION				HABITAT SPECIALIZATION			
	AVERAGE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE CONFIDENCE RATING	AVERAGE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE CONFIDENCE RATING
AAEN	3.3	2.0	5.0	2.3	3.0	1.0	5.0	2.6
ABAR	3.0	3.0	3.0	4.0	5.0	5.0	5.0	4.0
ABER	2.5	1.0	3.0	2.4	2.6	1.0	3.0	1.6
ABIC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ABRE	3.0	3.0	3.0	4.0	3.0	3.0	3.0	4.0
AGIL	3.0	3.0	3.0	3.0	3.7	3.0	5.0	2.7
AJOH	3.0	3.0	3.0	2.0	3.3	3.0	3.5	2.5
AKAT	4.4	3.0	5.0	4.3	4.7	3.0	5.0	4.4
ALAB	2.9	2.0	3.0	4.0	3.3	3.0	5.0	3.1
AMAR	2.7	1.0	3.0	3.9	3.1	1.0	5.0	3.3
AMOS	2.8	1.0	5.0	4.4	2.8	1.0	5.0	3.8
AMYA	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0
ANAT	4.9	4.0	5.0	4.6	4.9	4.0	5.0	4.6
ASCL	2.9	2.0	3.0	2.6	2.3	1.0	4.5	2.2
AURA	4.7	3.0	5.0	4.8	4.9	4.0	5.0	4.8
BAEN	2.5	2.0	3.0	3.5	1.8	1.0	2.5	4.0
BAFR	3.0	3.0	3.0	3.4	3.9	1.0	5.0	3.6
BAMA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAND	2.5	2.0	3.0	3.5	4.0	3.0	5.0	4.0
BANN	3.0	3.0	3.0	3.3	3.0	3.0	3.0	4.0
BANO	2.8	1.0	5.0	3.5	2.8	1.0	3.0	3.9
BARG	3.0	3.0	3.0	3.6	4.9	4.0	5.0	4.4
BBIF	3.0	3.0	3.0	3.3	2.5	1.0	3.0	4.0
BBRI	3.3	3.0	5.0	3.6	3.5	3.0	5.0	4.4
BCAL	2.7	2.0	3.0	4.3	3.3	2.0	5.0	4.0
BCAP	2.7	2.0	3.0	3.3	3.0	3.0	3.0	3.3
BERU	2.5	2.0	3.0	3.0	3.5	2.0	5.0	4.0

SPECIES	TROPHIC SPECIALIZATION				HABITAT SPECIALIZATION			
	AVERAGE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE CONFIDENCE RATING	AVERAGE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE CONFIDENCE RATING
BEUT	3.4	3.0	5.0	4.4	4.6	3.0	5.0	4.6
BGUR	3.0	3.0	3.0	1.0	4.0	4.0	4.0	4.0
BHOS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BIMB	1.0	1.0	1.0	4.4	1.6	1.0	3.5	4.3
BKIM	3.8	3.0	4.5	3.0	3.4	3.0	3.8	2.8
BLAT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BLIN	3.0	3.0	3.0	3.1	4.4	1.0	5.0	2.8
BMAR	2.4	1.0	3.0	4.8	2.8	1.0	3.2	4.4
BMAT	3.0	3.0	3.0	4.4	3.0	3.0	3.0	3.9
BMOT	3.4	3.0	5.0	4.9	3.0	3.0	3.0	3.9
BNAT	2.5	2.0	3.0	2.0	2.0	1.0	3.0	3.0
BNEE	3.3	3.0	5.0	4.7	3.4	3.0	5.0	4.4
BPAL	3.0	3.0	3.0	2.0	3.5	3.0	4.0	2.0
BPAU	1.6	1.0	5.0	4.2	1.4	1.0	3.0	3.9
BPOL	3.0	3.0	3.0	4.6	3.3	3.0	5.0	4.4
BRAD	3.0	3.0	3.0	3.6	2.0	1.0	3.0	4.1
BSER	2.5	2.0	3.0	4.0	3.0	3.0	3.0	4.0
BTOP	3.1	3.0	4.0	4.4	2.0	1.0	3.0	4.1
BTRE	3.1	3.0	4.0	4.6	4.0	3.0	5.0	4.6
BTRI	3.1	2.0	5.0	4.1	1.4	1.0	3.0	4.2
BTRV	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0
BUNI	1.1	1.0	2.0	4.0	1.3	1.0	3.5	3.9
BVIV	2.0	1.0	5.0	2.8	2.3	1.0	5.0	3.2
CANO	4.7	3.5	5.0	3.9	4.8	4.0	5.0	4.1
CAUR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CBIF	4.9	4.0	5.0	4.0	4.9	4.0	5.0	4.3
CBRE	3.3	3.0	5.0	3.8	1.5	1.0	3.0	4.3
CCAR	1.2	1.0	2.0	4.4	1.4	1.0	3.0	4.5
CEMA	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
CFLA	3.3	3.0	5.0	3.8	1.5	1.0	3.0	4.3
CGAR	1.0	1.0	1.0	4.3	1.2	1.0	2.2	4.2
CIDE	3.4	1.0	5.0	3.8	2.3	1.0	3.0	4.3
CMUL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CPAR	4.7	3.5	5.0	4.1	3.1	3.0	4.2	4.2
CPRE	4.4	1.0	5.0	4.4	4.8	4.0	5.0	4.7
CSWI	4.7	3.5	5.0	4.3	4.9	4.0	5.0	4.4
CTHE	2.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0

SPECIES	TROPHIC SPECIALIZATION				HABITAT SPECIALIZATION			
	AVERAGE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE CONFIDENCE RATING	AVERAGE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE CONFIDENCE RATING
GAES	3.5	1.0	5.0	3.0	2.8	1.0	5.0	3.3
GAFF	2.8	1.0	3.0	4.4	3.1	3.0	3.8	4.3
GCAL	2.9	1.0	5.0	4.2	2.4	1.0	5.0	3.7
GGIU	3.3	2.0	5.0	3.9	2.4	1.0	5.0	3.5
GZEB	2.5	2.0	3.0	4.0	3.0	3.0	3.0	4.0
HANS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HCAP	3.0	3.0	3.0	1.0	3.0	3.0	3.0	1.0
HMOL	4.9	4.0	5.0	4.5	3.0	3.0	3.0	4.5
HVIT	4.9	4.0	5.0	4.6	2.6	1.0	3.5	3.8
KAUR	3.5	3.0	5.0	4.6	3.0	3.0	3.0	4.0
LCAP	3.4	2.0	5.0	3.0	3.1	3.0	3.1	3.0
LCON	3.0	3.0	3.0	4.5	3.0	3.0	3.0	4.5
LCYL	3.3	3.0	5.0	4.3	3.0	2.0	3.8	4.3
LMAC	2.8	1.0	5.0	3.6	1.6	1.0	3.0	4.2
LMCR	3.5	3.0	4.0	3.0	2.5	2.0	3.0	3.0
LMOL	3.3	3.0	5.0	4.1	3.0	2.0	4.0	4.3
LRIC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LROS	1.6	1.0	3.0	4.5	2.5	1.0	3.0	4.3
LRUB	2.7	1.0	5.0	4.6	2.4	1.0	3.1	4.3
LRUD	2.3	1.0	3.0	4.3	3.0	2.9	3.0	3.9
LSEE	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
LUMB	2.8	1.0	5.0	3.8	2.0	1.0	3.0	3.9
MACU	1.7	1.0	5.0	4.5	1.5	1.0	3.5	4.3
MARG	3.0	3.0	3.0	4.0	3.5	3.0	4.0	4.0
MBRA	4.0	4.0	4.0	4.0	5.0	5.0	5.0	4.0
MBRE	3.1	3.0	4.0	4.4	2.2	1.0	3.5	4.2
MCAP	3.8	3.0	5.0	3.7	3.3	3.0	4.0	4.0
MCEP	3.3	2.0	5.0	3.7	2.0	1.0	3.0	3.7
MCYP	3.5	3.0	4.0	2.0	3.0	3.0	3.0	2.0
MDOL	3.0	3.0	3.0	4.2	2.5	1.0	3.0	3.8
MFAL	1.5	1.0	2.0	3.0	2.0	1.0	3.0	3.0
MFLU	4.0	4.0	4.0	4.0	5.0	5.0	5.0	4.0
MMAC	4.5	3.0	5.0	4.3	3.4	3.0	5.0	4.1
MPUN	3.0	3.0	3.0	0.0	1.0	1.0	1.0	0.0
MSAL	3.2	3.0	5.0	4.2	2.0	1.0	3.5	3.8
NORT	4.9	4.0	5.0	4.6	4.9	4.0	5.0	4.6
NRAC	4.9	4.0	5.0	4.6	4.9	4.0	5.0	4.6

SPECIES	TROPHIC SPECIALIZATION				HABITAT SPECIALIZATION			
	AVERAGE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE CONFIDENCE RATING	AVERAGE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE CONFIDENCE RATING
OAUR	1.0	1.0	1.0	3.0	2.0	2.0	2.0	3.0
OMAC	1.0	1.0	1.0	4.0	1.0	1.0	1.0	4.0
OMOS	1.2	1.0	3.0	4.5	1.9	1.0	5.0	4.3
OMYK	2.9	2.0	3.0	4.5	3.0	3.0	3.0	4.2
ONIL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OPER	3.8	3.0	5.0	4.2	4.9	4.0	5.0	4.5
OPLA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PAFE	2.5	2.0	3.0	2.0	4.0	3.0	5.0	3.0
PAMP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PANN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PASP	2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0
PBUG	2.5	2.0	3.0	4.0	3.0	3.0	3.0	4.0
PBUR	2.5	2.0	3.0	4.0	3.0	3.0	3.0	4.0
PCAT	4.9	4.0	5.0	4.5	3.3	3.0	5.0	4.3
PFLU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PPHI	1.3	1.0	3.0	4.6	1.4	1.0	3.0	4.5
PPHL	2.5	2.0	3.0	4.0	3.0	3.0	3.0	4.0
PQUA	0.0	0.0	0.0	4.0	4.0	4.0	4.0	4.0
PRET	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PTEN	2.0	2.0	2.0	4.0	3.0	3.0	3.0	4.0
RDEW	2.0	1.0	3.0	1.0	3.5	3.0	4.0	3.0
SBAI	3.0	3.0	3.0	3.0	5.0	5.0	5.0	3.0
SCAP	2.3	1.0	3.0	3.7	3.0	3.0	3.0	3.7
SFON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SINT	2.1	1.0	3.0	4.5	1.6	1.0	3.0	4.8
SMER	4.4	3.0	5.0	4.0	2.5	1.0	3.0	4.4
SSIB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
STRU	3.0	3.0	3.0	4.6	3.0	3.0	3.0	4.6
SZAM	1.2	1.0	3.0	4.3	3.2	3.0	4.0	3.9
TREN	1.4	1.0	3.0	4.7	1.7	1.0	3.0	4.7
TSPA	1.6	1.0	3.0	4.7	1.4	1.0	3.0	4.7
TTIN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VNEL	2.6	1.0	3.0	3.5	2.7	1.0	3.0	4.2
XHEL	1.2	1.0	2.0	4.2	3.1	3.0	4.0	4.2

TABLE : FRESHWATER SPECIES FLOW REQUIREMENT AND REQUIREMENT FOR UNMODIFIED WATER QUALITY.

INTOLERANCE RATINGS
1-2=TOLERANT
>2-3=MODERATELY TOLERANT
>3-4=MODERATELY INTOLERANT
>4-5=INTOLERANT
CONFIDENCE RATINGS
1-2=LOW CONFIDENCE
>2-3=MODERATE CONFIDENCE
>3-4=HIGH CONFIDENCE
>4-5=VERY HIGH CONFIDENCE

SPECIES	FLOW REQUIREMENT				REQUIREMENT: UNMODIFIED WATER QUALITY			
	AVERAGE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE CONFIDENCE RATING	AVERAGE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE CONFIDENCE RATING
AAEN	2.0	1.0	5.0	2.5	2.8	1.0	3.0	2.2
ABAR	5.0	5.0	5.0	4.0	5.0	5.0	5.0	4.0
ABER	1.1	1.0	2.0	2.2	1.8	1.0	3.0	2.7
ABIC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ABRE	2.0	2.0	2.0	4.0	3.0	3.0	3.0	4.0
AGIL	4.7	4.0	5.0	3.0	4.3	3.0	5.0	3.0
AJOH	1.5	1.0	2.0	3.5	3.8	3.5	4.0	2.0
AKAT	1.2	1.0	3.0	4.7	3.0	3.0	3.0	3.2
ALAB	2.8	1.0	5.0	3.8	2.7	1.0	4.0	3.3
AMAR	2.8	1.0	5.0	3.8	2.5	1.0	4.0	3.3
AMOS	2.8	1.0	5.0	4.1	2.5	1.0	4.0	3.1
AMYA	3.0	3.0	3.0	3.0	4.0	4.0	4.0	2.0
ANAT	4.9	4.0	5.0	4.6	4.9	4.0	5.0	4.6
ASCL	3.2	3.0	4.5	2.7	2.6	1.0	3.0	2.3
AURA	4.8	4.0	5.0	4.7	4.8	4.0	5.0	4.7
BAEN	3.3	3.0	3.5	4.0	2.5	2.0	3.0	3.5
BAFR	2.8	1.0	3.0	2.8	2.5	1.0	3.0	2.8
BAMA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAND	2.5	2.0	3.0	4.0	2.5	2.0	3.0	4.0
BANN	2.8	1.0	3.0	3.0	3.0	3.0	3.0	2.9
BANO	2.3	1.0	3.0	3.9	2.6	1.0	3.0	3.5
BARG	4.6	3.0	5.0	4.1	4.1	3.0	5.0	4.3
BBIF	2.5	1.0	3.0	4.0	3.0	3.0	3.0	3.8
BBRI	4.1	3.0	5.0	3.9	4.1	3.0	5.0	3.8
BCAL	3.7	3.0	5.0	4.0	4.0	3.0	5.0	4.0

SPECIES	FLOW REQUIREMENT				REQUIREMENT: UNMODIFIED WATER QUALITY			
	AVERAGE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE CONFIDENCE RATING	AVERAGE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE CONFIDENCE RATING
BCAP	3.3	3.0	4.0	3.7	3.3	3.0	4.0	3.3
BERU	4.5	4.0	5.0	3.5	3.5	3.0	4.0	3.5
BEUT	4.6	3.0	5.0	4.7	4.9	4.0	5.0	4.4
BGUR	2.0	2.0	2.0	2.0	4.0	4.0	4.0	2.0
BHOS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BIMB	3.0	3.0	3.0	4.1	3.2	3.0	4.5	3.6
BKIM	3.8	3.0	4.5	4.0	3.6	3.0	4.1	3.0
BLAT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BLIN	4.4	1.0	5.0	1.9	4.6	3.0	5.0	3.0
BMAR	3.2	3.0	4.5	4.4	2.1	1.0	3.0	4.3
BMAT	3.0	3.0	3.0	4.1	3.2	3.0	4.0	3.6
BMOT	3.0	3.0	3.0	4.1	3.1	3.0	4.0	4.3
BNAT	3.5	3.0	4.0	3.0	3.0	3.0	3.0	3.0
BNEE	3.4	3.0	5.0	4.5	3.4	3.0	5.0	3.5
BPAL	2.8	2.5	3.0	3.5	3.3	3.0	3.5	2.5
BPAU	2.3	1.0	3.0	4.1	1.8	1.0	3.0	4.3
BPOL	3.3	3.0	5.0	4.4	2.9	2.0	3.0	4.5
BRAD	2.8	1.0	3.0	3.8	1.4	1.0	3.0	3.5
BSER	3.5	3.0	4.0	3.5	4.0	4.0	4.0	3.5
BTOP	1.1	1.0	2.0	3.9	3.0	3.0	3.0	4.3
BTRE	3.0	3.0	3.0	4.1	4.7	4.0	5.0	3.8
BTRI	2.7	1.0	3.2	3.9	1.8	1.0	3.0	3.7
BTRV	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0
BUNI	2.3	1.0	4.0	3.4	2.2	1.0	4.0	3.7
BVIV	2.3	1.0	3.0	1.4	3.0	3.0	3.0	3.1
CANO	4.8	4.0	5.0	4.3	4.7	3.5	5.0	3.8
CAUR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CBIF	4.9	4.0	5.0	4.5	4.9	4.0	5.0	4.0
CBRE	1.3	1.0	3.0	4.3	2.5	1.0	3.0	3.8
CCAR	2.1	1.0	5.0	4.5	1.1	1.0	2.0	4.5
CEMA	5.0	5.0	5.0	5.0	5.0	5.0	5.0	0.0
CFLA	1.3	1.0	3.0	4.5	2.0	1.0	3.0	4.3
CGAR	1.7	1.0	3.0	4.3	1.0	1.0	1.0	4.5
CIDE	3.3	3.0	5.0	4.5	1.5	1.0	3.0	3.1
CMUL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CPAR	3.2	3.0	4.5	4.2	3.1	3.0	3.8	3.8

SPECIES	FLOW REQUIREMENT				REQUIREMENT: UNMODIFIED WATER QUALITY			
	AVERAGE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE CONFIDENCE RATING	AVERAGE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE CONFIDENCE RATING
CPRE	4.8	4.0	5.0	4.1	4.5	3.0	5.0	4.0
CSWI	4.8	4.0	5.0	4.4	3.3	3.0	5.0	3.6
CTHE	1.0	1.0	1.0	4.0	2.0	2.0	2.0	1.0
GAES	1.5	0.0	3.0	3.7	3.0	3.0	3.0	3.0
GAFF	1.1	1.0	2.0	4.7	1.2	1.0	2.2	4.1
GCAL	1.5	1.0	3.0	3.2	2.3	1.0	3.0	3.2
GGIU	1.7	1.0	3.0	2.8	2.5	1.0	3.0	2.7
GZEB	2.5	2.0	3.0	4.0	2.5	2.0	3.0	4.0
HANS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HCAP	1.0	1.0	1.0	1.0	3.0	3.0	3.0	1.0
HMOL	3.3	3.0	5.0	4.5	2.5	1.0	3.0	4.3
HVIT	2.7	1.0	3.5	3.8	3.1	3.0	4.1	3.2
KAUR	2.5	1.0	3.0	3.5	4.1	3.0	5.0	2.8
LCAP	3.5	3.0	3.9	3.5	2.8	2.5	3.0	3.0
LCON	3.3	3.0	5.0	4.3	3.0	3.0	3.0	3.9
LCYL	3.1	3.0	4.1	4.1	3.1	3.0	4.1	3.9
LMAC	1.1	1.0	2.0	4.2	2.2	1.0	3.0	3.9
LMCR	1.5	1.0	2.0	2.5	3.0	3.0	3.0	1.0
LMOL	3.3	3.0	5.0	4.1	3.2	3.0	4.1	3.8
LRIC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LROS	2.5	1.0	3.0	3.6	3.0	3.0	3.0	3.9
LRUB	2.5	1.0	3.5	3.5	3.0	3.0	3.0	3.2
LRUD	2.9	2.5	3.0	3.3	3.0	3.0	3.0	3.7
LSEE	3.5	3.0	4.0	2.5	3.0	3.0	3.0	3.0
LUMB	2.7	1.0	3.0	3.8	1.6	1.0	3.0	3.4
MACU	3.1	3.0	3.8	4.3	3.1	3.0	3.8	4.1
MARG	1.5	1.0	2.0	4.0	2.0	1.0	3.0	3.5
MBRA	1.0	1.0	1.0	4.0	4.0	4.0	4.0	3.0
MBRE	1.1	1.0	2.0	4.4	2.8	1.0	3.5	4.1
MCAP	3.5	3.0	5.0	3.7	3.0	3.0	3.0	3.0
MCEP	2.8	2.0	3.0	3.3	2.5	2.0	3.0	2.7
MCYP	2.5	2.0	3.0	3.0	2.5	2.0	3.0	2.5
MDOL	1.0	1.0	1.0	4.0	2.6	1.0	5.0	4.2
MFAL	3.0	3.0	3.0	3.0	2.0	1.0	3.0	3.0
MFLU	1.0	1.0	1.0	4.0	4.0	4.0	4.0	3.0
MMAC	3.0	3.0	3.0	4.0	3.4	3.0	5.0	3.5

SPECIES	FLOW REQUIREMENT				REQUIREMENT: UNMODIFIED WATER QUALITY			
	AVERAGE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE CONFIDENCE RATING	AVERAGE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE CONFIDENCE RATING
MPUN	1.0	1.0	1.0	0.0	3.0	3.0	3.0	0.0
MSAL	1.1	1.0	2.0	4.1	2.3	1.0	3.1	3.8
NORT	2.3	1.0	3.0	4.4	4.9	4.0	5.0	4.5
NRAC	2.3	1.0	3.0	4.4	4.9	4.0	5.0	4.5
OAUR	1.0	1.0	1.0	4.0	2.0	2.0	2.0	3.0
OMAC	1.0	1.0	1.0	4.0	1.0	1.0	1.0	4.0
OMOS	0.9	0.0	1.2	4.5	1.3	1.0	3.0	4.4
OMYK	3.3	3.0	5.0	4.5	4.5	3.0	5.0	4.3
ONIL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OPER	4.9	4.0	5.0	4.5	4.4	3.0	5.0	4.4
OPLA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PAFE	4.0	3.0	5.0	3.5	3.5	3.0	4.0	2.5
PAMP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PANN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PASP	5.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0
PBUG	4.0	3.0	5.0	3.5	3.5	3.0	4.0	3.0
PBUR	4.5	4.0	5.0	4.0	4.0	4.0	4.0	4.0
PCAT	2.8	1.0	3.0	4.5	3.0	3.0	3.0	4.0
PFLU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PPHI	1.0	1.0	1.0	4.6	1.4	1.0	3.0	4.2
PPHL	4.0	3.0	5.0	3.5	3.5	3.0	4.0	3.0
PQUA	0.0	0.0	0.0	4.0	4.0	4.0	4.0	4.0
PRET	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PTEN	5.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0
RDEW	1.0	1.0	1.0	3.0	3.5	3.0	4.0	2.0
SBAI	1.0	1.0	1.0	3.0	5.0	5.0	5.0	2.0
SCAP	2.0	1.0	3.0	3.7	2.0	1.0	3.0	3.7
SFON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SINT	1.3	1.0	3.0	4.5	1.8	1.0	3.0	4.3
SMER	1.0	1.0	1.0	4.5	3.0	3.0	3.0	4.3
SSIB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
STRU	3.2	3.0	5.0	4.5	4.4	3.0	5.0	4.5
SZAM	1.8	1.0	3.0	3.8	3.0	3.0	3.0	4.0
TREN	1.8	1.0	5.0	4.5	2.1	1.0	4.0	4.3
TSPA	0.9	0.0	1.8	4.6	1.4	1.0	3.0	4.1
TTIN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SPECIES	FLOW REQUIREMENT				REQUIREMENT: UNMODIFIED WATER QUALITY			
	AVERAGE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE CONFIDENCE RATING	AVERAGE RATING	MINIMUM RATING	MAXIMUM RATING	AVERAGE CONFIDENCE RATING
VNEL	3.6	0.0	5.0	4.0	3.4	1.0	5.0	4.0
XHEL	1.4	1.0	3.0	4.5	1.4	1.0	3.0	4.2

TABLE : FRESHWATER FISH SPECIES AVERAGE OVERALL INTOLERANCE RATINGS

INTOLERANCE RATINGS
1-2=TOLERANT
>2-3=MODERATELY TOLERANT
>3-4=MODERATELY INTOLERANT
>4-5=INTOLERANT
CONFIDENCE RATINGS
1-2=LOW CONFIDENCE
>2-3=MODERATE CONFIDENCE
>3-4=HIGH CONFIDENCE
>4-5=VERY HIGH CONFIDENCE

SPECIES	AVERAGE OVERALL INTOLERANCE RATING	AVERAGE CONFIDENCE RATING
AAEN	2.8	2.5
ABAR	4.5	4.1
ABER	2.0	2.1
ABIC	0.0	0.0
ABRE	2.8	3.7
AGIL	3.9	3.1
AJOH	2.9	2.7
AKAT	3.3	4.2
ALAB	2.9	3.5
AMAR	2.8	3.4
AMOS	2.8	3.8
AMYA	3.3	2.8
ANAT	4.9	4.7
ASCL	2.7	2.6
AURA	4.8	4.8
BAEN	2.5	3.5
BAFR	3.0	3.2
BAMA	0.0	0.0
BAND	2.9	3.6
BANN	2.9	3.3
BANO	2.6	3.5
BARG	4.2	4.1
BBIF	2.8	3.5
BBRI	3.8	3.9
BCAL	3.4	3.9
BCAP	3.1	3.4
BERU	3.5	3.5
BEUT	4.3	4.5
BGUR	3.3	2.6
BHOS	0.0	0.0
BIMB	2.2	3.8
BKIM	3.6	3.3
BLAT	0.0	0.0
BLIN	4.1	3.0

SPECIES	AVERAGE OVERALL INTOLERANCE RATING	AVERAGE CONFIDENCE RATING
BMAR	2.6	4.1
BMAT	3.0	3.9
BMOT	3.1	4.0
BNAT	2.8	2.7
BNEE	3.4	4.2
BPAL	3.1	2.7
BPAU	1.8	3.5
BPOL	3.1	4.1
BRAD	2.3	3.4
BSER	3.3	3.7
BTOP	2.3	3.7
BTRE	3.7	4.2
BTRI	2.2	3.6
BTRV	3.0	2.3
BUNI	1.7	3.3
BVIV	2.4	2.5
CANO	4.8	4.3
CAUR	0.0	0.0
CBIF	4.9	4.4
CBRE	2.1	3.6
CCAR	1.4	3.7
CEMA	5.0	5.0
CFLA	2.0	3.6
CGAR	1.2	3.5
CIDE	2.6	3.8
CMUL	0.0	0.0
CPAR	3.5	4.0
CPRE	4.6	4.4
CSWI	4.4	4.4
CTHE	2.0	2.8
GAES	2.7	3.2
GAFF	2.0	3.9
GCAL	2.3	3.3
GGIU	2.5	3.2
GZEB	2.6	3.7
HANS	0.0	0.0
HCAP	2.5	1.4
HMOL	3.4	4.2
HVIT	3.3	3.9
KAUR	3.3	3.9
LCAP	3.2	3.2
LCON	3.1	4.1
LCYL	3.1	4.0
LMAC	1.9	3.5

SPECIES	AVERAGE OVERALL INTOLERANCE RATING	AVERAGE CONFIDENCE RATING
LMCR	2.6	2.8
LMOL	3.2	3.9
LRIC	0.0	0.0
LROS	2.4	3.7
LRUB	2.7	3.8
LRUD	2.8	3.6
LSEE	3.1	2.9
LUMB	2.3	3.4
MACU	2.3	3.9
MARG	2.5	3.6
MBRA	3.5	3.9
MBRE	2.3	3.8
MCAP	3.4	3.7
MCEP	2.6	3.3
MCYP	2.9	2.5
MDOL	2.3	3.6
MFAL	2.1	2.8
MFLU	3.5	3.9
MMAC	3.6	4.0
MPUN	2.0	0.0
MSAL	2.2	3.5
NORT	4.2	4.5
NRAC	4.2	4.5
OAUR	1.5	2.9
OMAC	1.0	3.3
OMOS	1.3	3.6
OMYK	3.4	4.1
ONIL	0.0	0.0
OPER	4.5	4.4
OPLA	0.0	0.0
PAFE	3.5	3.0
PAMP	0.0	0.0
PANN	0.0	0.0
PASP	3.3	3.1
PBUG	3.3	3.7
PBUR	3.5	3.9
PCAT	3.5	4.2
PFLU	0.0	0.0
PPHI	1.3	3.7
PPHL	3.3	3.7
PQUA	0.0	0.0
PRET	0.0	0.0
PTEN	3.5	3.9
RDEW	2.5	2.4

SPECIES	AVERAGE OVERALL INTOLERANCE RATING	AVERAGE CONFIDENCE RATING
SBAI	3.5	3.1
SCAP	2.3	3.3
SFON	0.0	0.0
SINT	1.7	3.9
SMER	2.7	3.9
SSIB	0.0	0.0
STRU	3.4	4.5
SZAM	2.3	3.6
TREN	1.8	3.9
TSPA	1.3	3.8
TTIN	0.0	0.0
VNEL	3.1	3.7
XHEL	1.8	3.7