QUEEN CHARLOTTE ISLANDS REGION

The Queen Charlotte Archipelago lies about 150 km off the north coast of BC (Fig. 8). There are two main islands: Graham and Moresby. The Queen Charlotte Ranges, an extension of the Vancouver Island mountain system, run along the west side of the islands. To the east of the ranges lies the Skidegate Plateau and, on Graham Island, the Queen Charlotte Lowlands lie to the east of the plateau. The climate is relatively mild and wet. In the ranges and on the plateau, most of the rivers are short and have high gradients, while the lakes are clear. In the lowlands, most waters are highly stained and stream gradients are low.

Northcote et al. (1989) list 14 species of freshwater fishes from the islands (Table 7). In addition, four inshore marine species regularly enter streams in the lowlands: two of these (staghorn sculpin, *Leptocottus armatus*, and starry flounder, *Platichthys stellatus*) are common in the upper reaches of estuaries and sometimes penetrate above the region of tidal influence. The other two species (sharpnose sculpin *Clinocottus acuticeps* and tidepool sculpin *Oligocottus maculosus*) are rare in areas above tidal influence but are common in the upper reaches of estuaries.

Not surprisingly, all the freshwater species on the Queen Charlotte Islands are salt tolerant, and probably reached the islands by dispersing through the sea. Nonetheless, the northeast corner of Graham Island is one of the few areas in BC that escaped the last (Fraser) glaciation (Warner et al. 1982). Thus, this area may retain remnants of a pre-glacial fauna. Certainly, the area contains a remarkable diversity of sticklebacks including a population in Boulton Lake that contains a high frequency of completely

Species	**Queen Charlotte Islands**
Lampetra richardsoni	+
L. tridentata	+
Oncorhynchus clarki clarki	+
O. gorbuscha	+
O. keta	+
O. kisutch	+
O. mykiss	+
O. nerka	+
O. tshawytscha	+
Salvelinus malma	+
Thaleichthys pacificus	+
Gasterosteus aculeatus	+
Cottus aleuticus	+
C. asper	+
Clinocottus acuticeps	**T**
Leptocottus armatus	**T**
Oligocuttus maculosus	**T**
Platichthys stellatus	**T**

Table 7: Species list of Queen Charlotte Islands

+ = present	**T** = areas under tidal influence

unarmoured individuals (Moodie and Reimchen 1976, Reimchen et al. 1985), and there is genetic evidence that some of these may be pre-glacial relicts (O' Reilly 1991). Thus, although fish diversity on the islands appears to be low, this may be an illusion. If sticklebacks survived the last glaciation on Graham Island, perhaps other fish did as well and there still may be diversity to be uncovered.

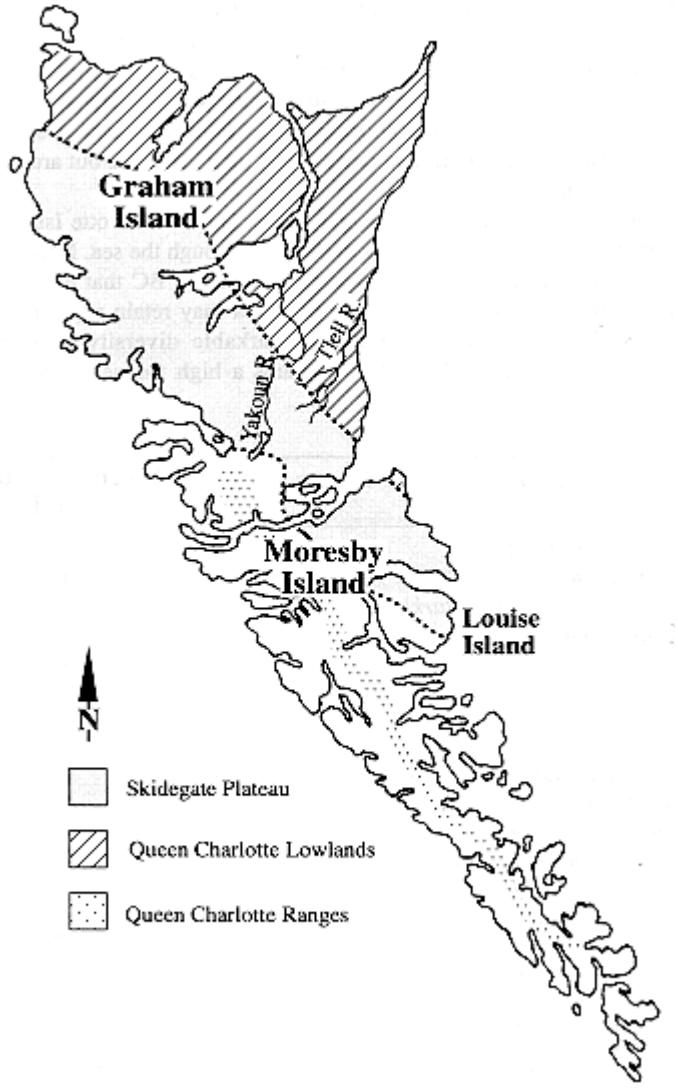


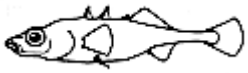
Figure 8
Queen Charlotte Islands

Pictorial Key to Families

LAMPREYS (PETROMYZONTIDAE) 154

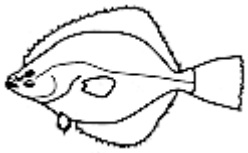
SMELTS (OSMERIDAE) 155

SALMON, TROUT, CHAR (SALMONIDAE) 155
(SUBFAMILY SALMONINAE)



STICKLEBACKS (GASTEROSTEIDAE) 161

SCULPINS (COTTIDAE) 162



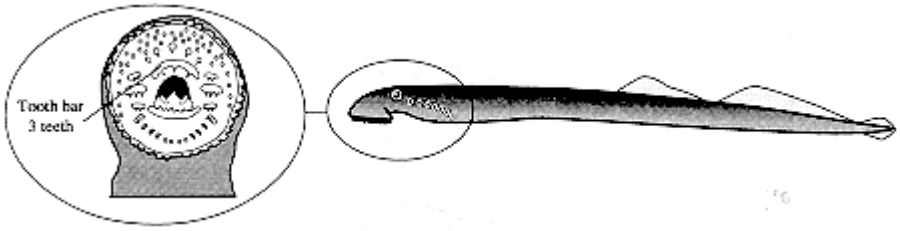
FLOUNDERS (PLEURONECTIDAE) 164

LAMPREYS
FAMILY PETROMYZONTIDAE

Lampreys are not easy to identify. Their morphology changes with each of three distinctive life-history stages: filter-feeding ammocoetes, newly transformed "macrophthalmic" juveniles, and adults. For adults, tooth patterns and body size provide reliable field guides (a hand-lens is useful here), but for ammocoetes and newly transformed juveniles positive identifications require morphometric and meristic comparisons. Ammocoetes usually are associated with slow currents and soft, mud bottoms. Transformation takes place from late summer through early autumn, and the macrophthalmic juveniles move into faster water over gravel substrates. In anadromous species (Pacific lamprey), the seaward migration of young adults occurs in the spring. Spawning also usually occurs in the spring but in the non-parasitic brook lamprey spawning can extend into summer. On the Queen Charlotte Islands, adult Pacific lamprey appear to return from the sea in the fall and over-winter in fresh water before spawning the next spring.

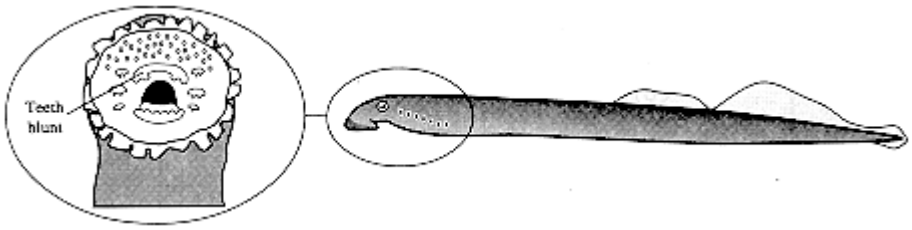
1 (4) Mouth a sucking disk; teeth and eyes present

adult or transforming lampreys
2



2 (3) Tooth bar immediately above mouth has three teeth; adults larger than 200 mm; teeth sharp; present in most of the rivers on the islands

Pacific lamprey
Lampetra tridentata



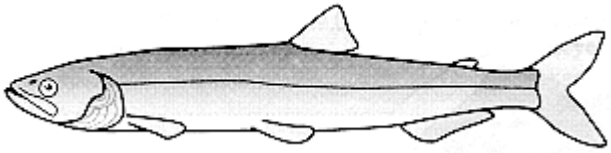
3 (2) Tooth bar immediately above mouth has two teeth; adults less than 160 mm in length; teeth blunt; most common in tributaries of the Yakoun and Tlell systems, Graham Island

Western brook lamprey
Lampetra richardsoni

4 (1) Eyes absent or poorly develpoed; teeth absent; muth not modified into a sucking disk

ammocoetes or larvel lampreys
(see lamprey key in appendix, page 195)

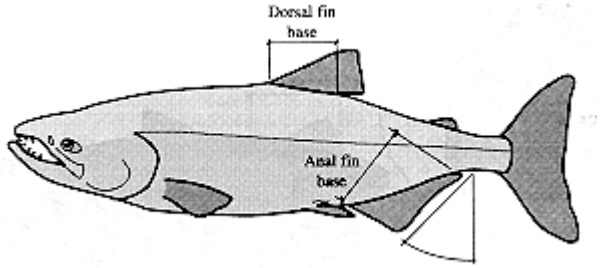
SMELTS
FAMILY OSMERIDAE



The eulachon (*Thaleichthys pacificus*) is the only smelt recorded from fresh waters on the Queen Charlotte Islands. Here, the species is not abundant and occurs only sporadically in the Yakoun system on Graham Island.

SALMON, TROUTS AND CHARS
FAMILY SALMONIDAE
(SUBFAMILY SALMONINAE)

KEY TO THE ADULTS

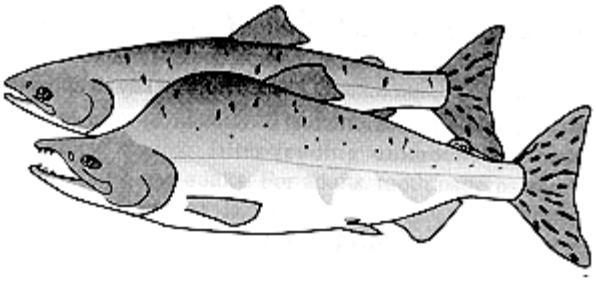


1 (10) Anal fin base longer than dorsal fin base; in profile, hind margin of anal fin slants backwards (not vertical)

2

2 (7) Distinct spots on tail

3

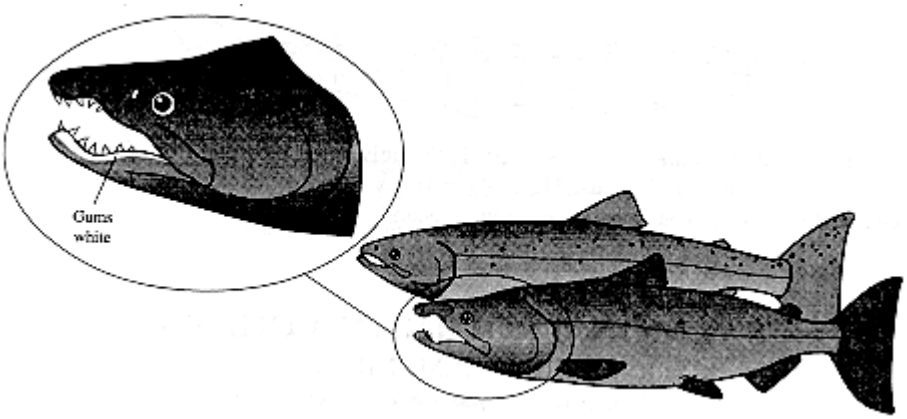


3 (4) Tail spots oblong (not round)

Pink salmon
Oncorhynchus gorbuscha

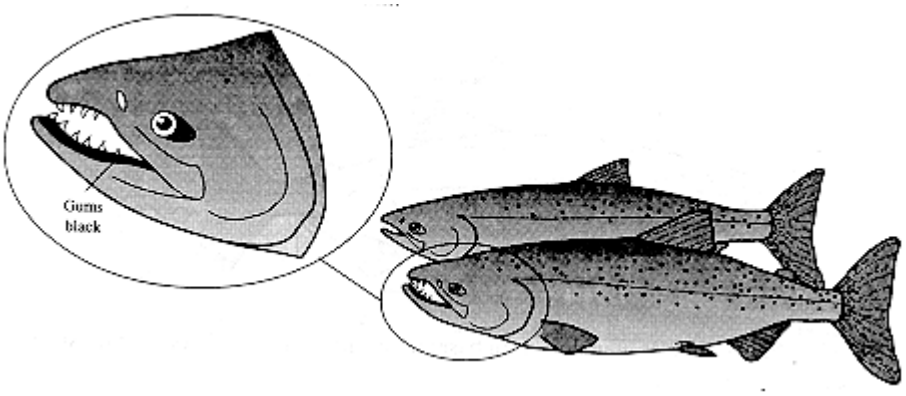
4 (3) Tail spots round (not oblong)

5



5 (6) Tail spotted on upper half; gums at base of teeth in lower jaw white

Coho salmon
Oncorhynchus kisutch

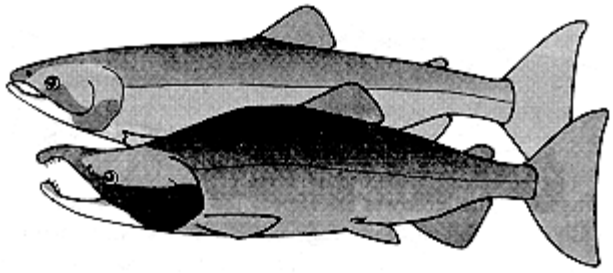


6 (5) Tail spotted on both upper and lower halves; gums at base of teeth in lower jaw black

Chinook salmon
Oncorhynchus tshawytscha

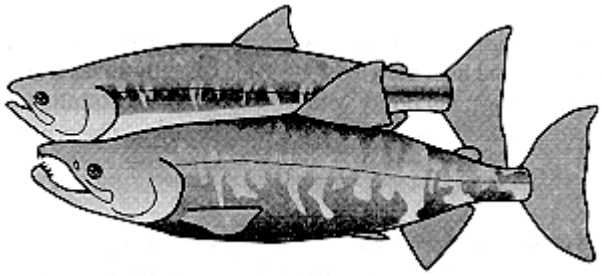
7 (2) No spots on tail, but occasionally some fine speckles

8



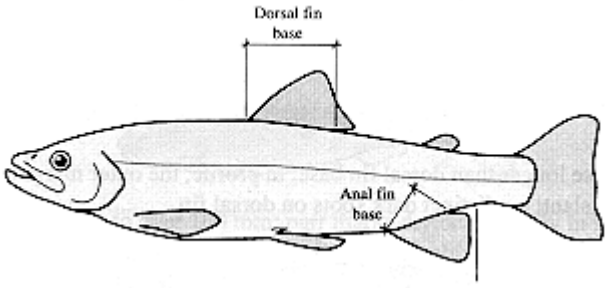
8 (9) Adults occur in freshwater both as migratory spawners (sockeye) and as residents (kokanee); flanks are uniformly coloured (silver in non-breeding kokanee, red in breeding sockeye and kokanee)

Sockeye salmon
(Kokanee)
Oncorhynchus nerka



9 (8) Adults only in freshwater as spawners; flanks in males pale with ireegular red and black blotches, females with purplish lateral stripe

Chum salmon
Oncorhynchus keta

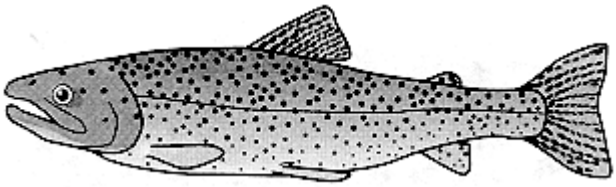


10 (1) Base of dorsal fin equal to, or longer than, anal fin base; in profile, hind margin of anal fin is vertical (no backward slant)

11

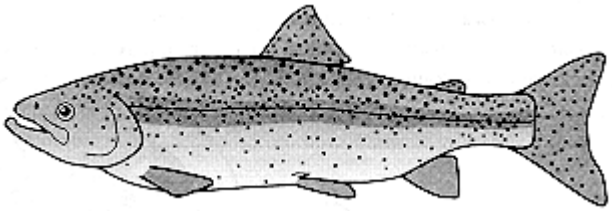
11 (14) Background colour on flanks light (silver or golden) with dark spots

12



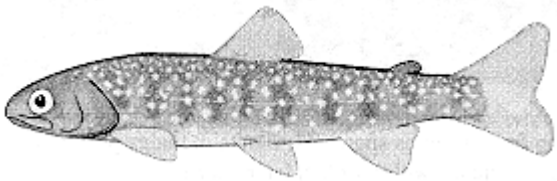
12 (13) Red or orange slash under lower jaw; upper jaw extends back past hind margin of eye; tail usually yellowish with black spots

Coastal cutthroat trout
Oncorhynchus clarki clarki



13 (12) No red or orange slash under lower jaw; except in spawning males upper jaw does not extend back beyond hind margin of eye; sides usually silver with a pink hue extending along midline; tail dusky with dark spots

Rainbow trout
Oncorhynchus mykiss



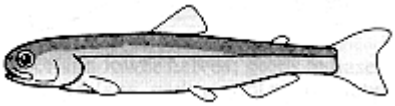
14 (11) Background colour on sides dark with light or coloured spots

Dolly Varden
Salvelinus malma

KEY TO YOUNG SALMONIDS (45 -100mm)

1 (10) Anal fin base longer than dorsal fin base; in profile, the outer margin of anal fin has a backward slant; no distinct dark spots on dorsal fin

2



2 (3) Sides silvery; no par marks; back iridescent greenish-blue; length usually less than 50 mm in fresh water; widespread throughout the islands

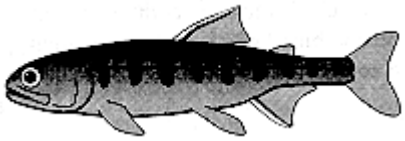
Pink Salmon
Oncorhynchus gor buscha

3 (2) Parr marks on flanks

4

4 (7) Parr marks in the form of deep bars, the largest marks deeper than the vertical eye diameter

5



5 (6) Adipose fin uniformly pigmented; parr marks variable but in Queen Charlotte populations the spaces between marks are usually wider than the marks themselves; anal fin sickle-shaped, with a conspicuous white leading edge contrasting sharply with the dark pigment behind; common throughout the islands.

Coho Salmon
Oncorhynchus kisutch

6 (5) Adipose fin with a clear unpigmented "window"; spaces between parr marks usually wider than the marks themselves; anal fin not sickle-shaped, white leading edge of anal fin not conspicuously contrasting with the dark pigment behind; common only in the Yakoun system

Chinook salmon
Oncorhynchus tshawytscha

7 (4) Parr marks small, oval shaped, none much higher than the vertical diameter of the eye

8

8 (9) Size in fresh water to over 100 mm; parr marks divided roughly in half by mid-line; combined width of parr marks less than half the combined width of light areas along the side; no greenish iridescence on sides below mid-line; rare in the ranges, more common on the Plateau and in lowland systems with suitable rearing lakes

Sockeye salmon
(Kokanee)
Oncorhynchus nerka

9 (8) Size in fresh water usually less than 50 mm; back mottled green, sides silvery, with a faint green iridenscence below mid-line; combined width of dark areas along mid-line more than half the combined width of the light areas; parr marks faint or absent below mid-line; most common in the Ranges

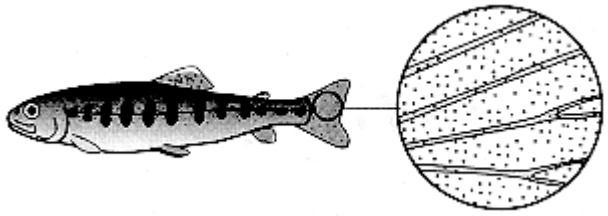
Chum salmon
Oncorhynchus

10 (1) Dorsal fin base equal to or longer than anal fin base; in profile, hind margin of anal fin vertical

11

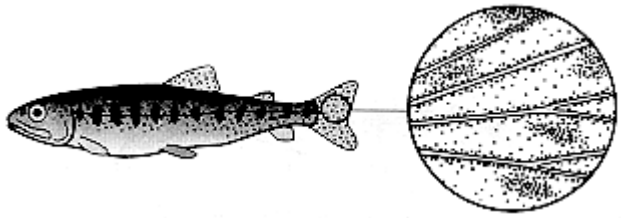
11 (14) Numerous distinct dark spots on dorsal fin; in very small specimens the first dorsal ray may be black

12



12 (13) On fish below 50 mm melanophores are evenly distributed over entire tail; no red or yellow marks under chin; hind margin of upper jaw not reaching hind margin of eye; the only trout present on most of the west coast of Graham Island and all of the west coast of Moresby Island

Rainbow trout*
Oncorhynchus mykiss



13 (12) Usually black spots on tail, even on fish less than 50 mm melanophores on tail are starting to concentrate between the rays, often forming short dark streaks (precursors of spots); often red or yellow marks under chin; hind margin of upper jaw usually reaches to or past hind margin of eye; appears to be absent from the Ranges, but present on the Plateau on Graham, Moresby and Louise islands, and abundant in the lowlands on Graham Island.

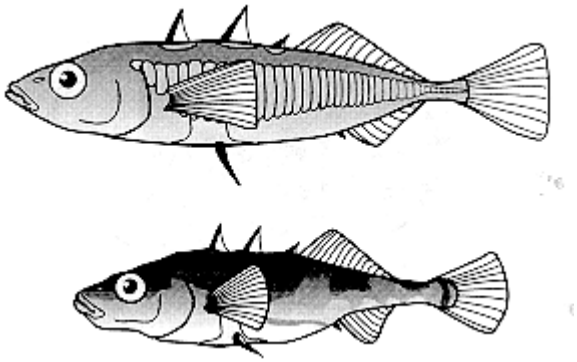
Coastal cutthroat trout*
Oncorhynchus clarki clarki

14 (11) Dorsal fin without dark spots; first dorsal ray not black; parr marks are irregular blotches; width of dark areas on mid-line greater than width of light areas; abundant throughout the islands, often theonly species above barriers

Dolly Varden
Salvelinus malma

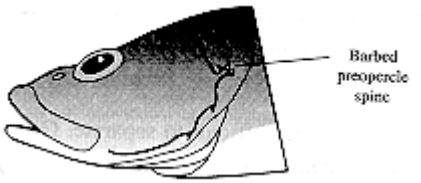
* The young of these species are difficult to separate. Generally, cutthroat are more heavily pigmentated on the underside than rainbow, and have smaller eyes and longer upper jaws. In several areas on Graham and Moresby islands identification is made even more difficult by persistent hybridization between the species.

STICKLEBACKS
FAMILY GASTEROSTEIDAE



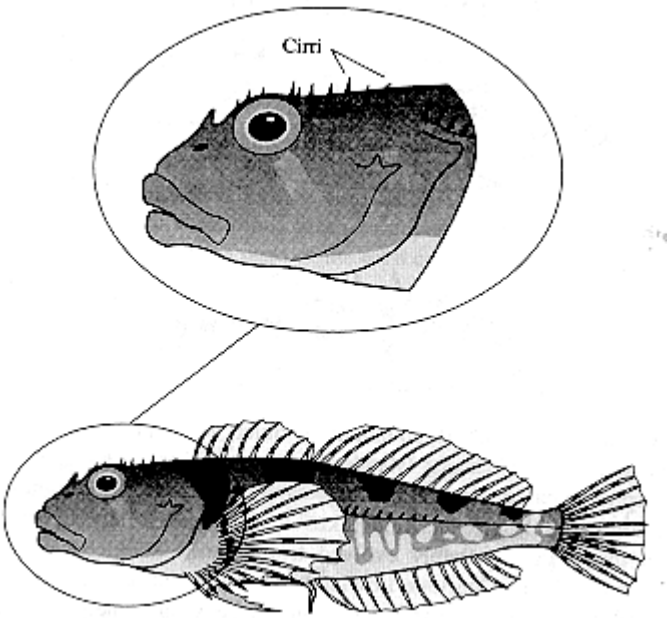
The threespine stickleback is abundant in quiet, lowland waters throughout the archipelago. On the Queen Charlotte Islands, this notoriously variable species exists as a complex of morphological, ecological and behavioural forms. It is common in the sea, in estuaries and low altitude streams and lakes of all sizes. Many of the freshwater populations on the islands probably evolved from marine sticklebacks after the last glaciation, but on the Queen Charlotte Lowlands some populations may pre-date the last glaciation (O' Reilly 1991). There are two situations on the islands where divergent forms of Gasterosteus coexist. 1) Anadromous populations ascend freshwater streams in the spring and breed alongside freshwater resident populations. This situation appears to be less common on the Queen Charlotte Islands than it is on the mainland. 2) In Drizzle and Mayer lakes on Graham Island there are distinctly different lake and stream sticklebacks. The two forms are ecologically and morphologically differentiated and rarely interbreed (Stinson 1982; Reimchen *et al*. 1985).

SCULPINS
FAMILY COTTIDAE



1 (4) Spine on preopercle with 2 to 4 obvious hooks

2

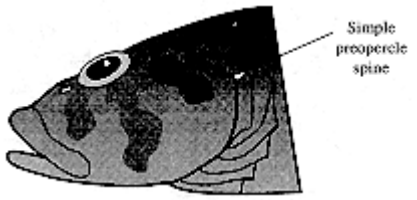


2 (3) Cirri on head and lateral line; body size less than 100 mm

Tidepool sculpin
Oligocottus maculosus

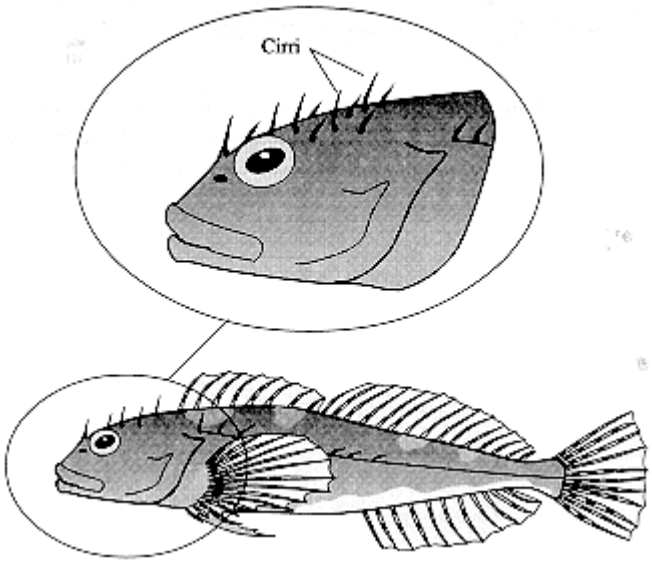
3 (2) No cirri on head orlateral line; body size to 300 mm

Pacific staghorn sculpin
Leptocottus armatus



4 (1) Spine on preeopercle simple

5

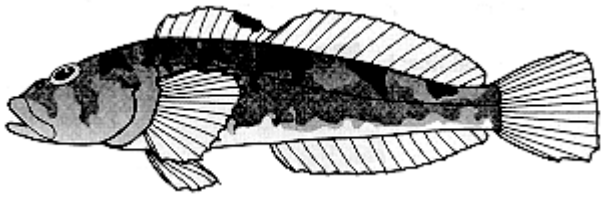


6 (5) Cirri on head and lateral line

Sharpnose sculpin
Clinocottus acuticeps

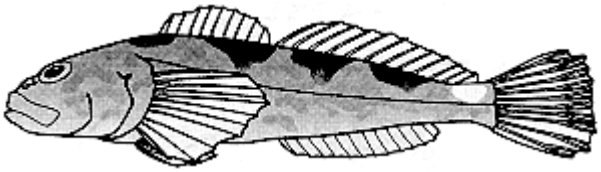
6 (5) no cirri on head or lateral line

7



7 (8) First dorsal with a distinct black spot (except in breeding males); anal fin base distinctly longer than head

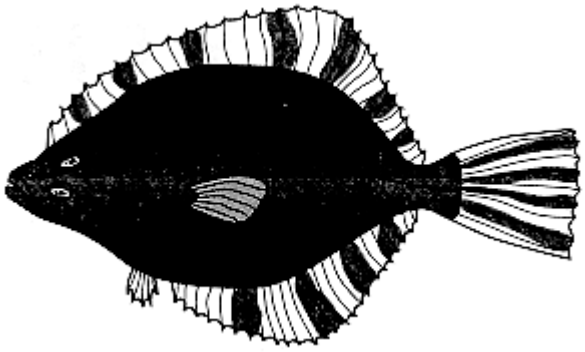
Prickly sculpin
Cottus asper



8 (7) First dorsal fin without distinct black spot; anal fin base about equal to head length

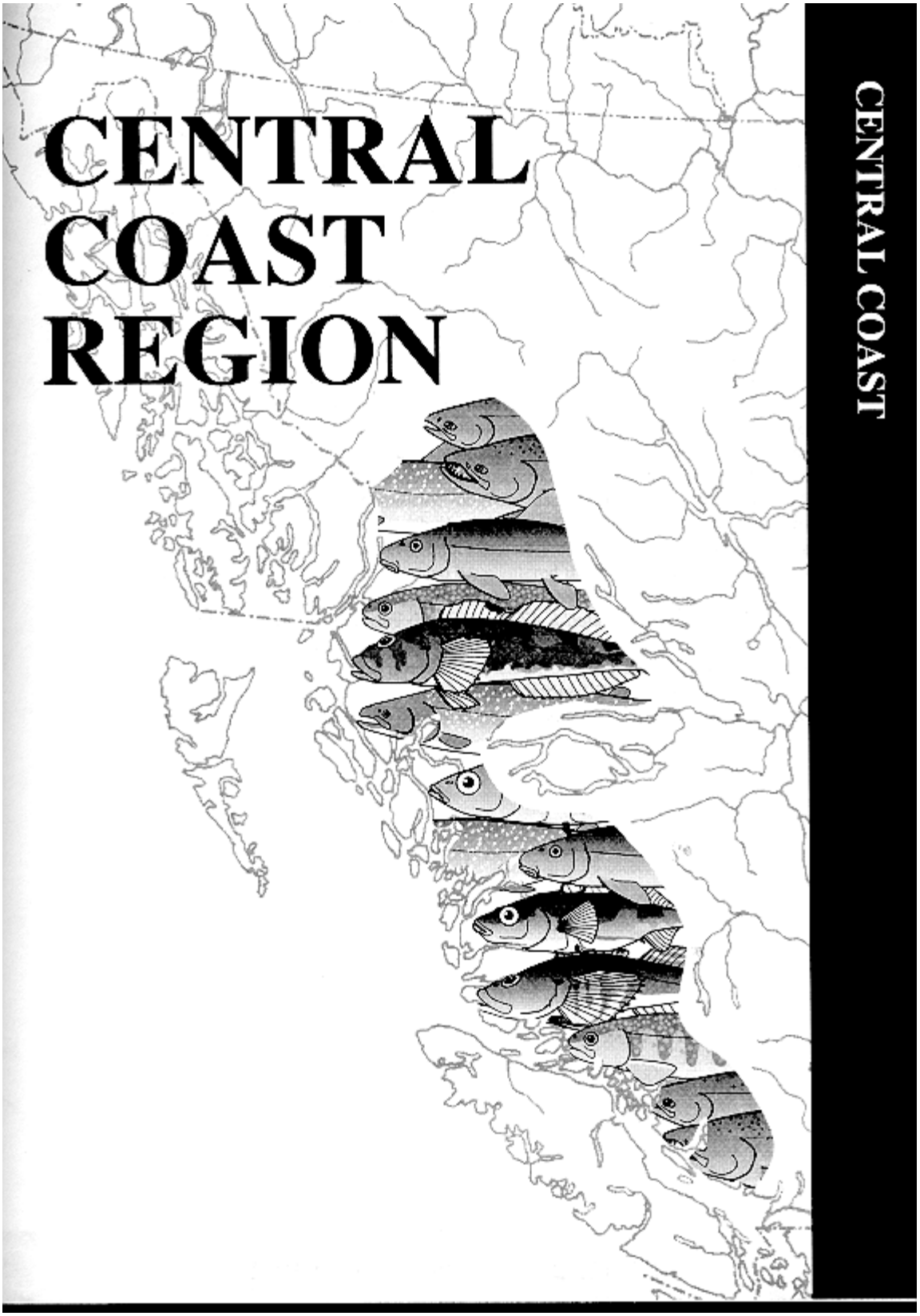
Coastrange sculpin
Cottus aleuticus

FLOUNDERS
FAMILY PLEURONECTIDAE



The starry flounder (*Platichthys stellatus*) is a common inshore marine species. Juveniles are especialy abundant in estuaries and regularly penetrate low gradient rivers up to the limits of tidal influence.

CENTRAL COAST REGION



Like the north coast, the central coast is characterized by a series of relatively short, high- gradient rivers that rise east of the Coast Range and flow westward through the mountains to the sea (Fig.9). The central coast rivers fall into two natural groups: to the north, the Nass and Skeena rivers rise at about 1000 m in the Skeena Mountains, and to the south, a series of shorter rivers (the Dean, Bella Coola, Klinaklini, and Homathko) rise on the Interior Plateau and fiow through the mountains to the sea.

There are 32 species of fish in the Skeena and 27 in the Nass. In their lower reaches they share a salt-tolerant fauna common to most coastal rivers, but in their upper and middle reaches both rivers are dominated by Columbia species (Table 8). Indeed, it is the presence of Columbia species (*e.g.* largescale sucker, *Catostomus macrocheilus*; redside shiner, Richardsonius balteatus; peamouth, *Mylocheilus caurinus*, and squawfish *Ptychocheilus oregonesis*) that set the central coast rivers apart from the north coast rivers. In addition, the upper Skeena contains seven species (lake trout, *Salvelinus namaycush*; lake whitefish, *Coregonus clupeaformis*; pygmy whitefish, *Prosopium coulteri*; lake chub, *Couesius plumbeus*; longnose dace, *Rhinichthys cataractae*; white sucker, *Catostomus commersoni*, and burbot, *Lota lota*) that apparently are absent from the Nass. Of these, the white sucker is unquestionably of eastern North American origin, but lake trout and lake whitefish may also have entered the Skeena from the east by way of glacial connections between the Skeena, Fraser and Peace rivers.

The other central coast rivers (the Dean, Bella Coola, Klinaklini, and Homathko rivers) rise on the relatively flat Interior Plateau close to Fraser River tributaries.

Typically, the headwaters of these rivers are isolated from their lower reaches by canyons and cataracts, and contain some Columbia species derived from the Fraser. In contrast, the lower reaches of these same rivers contain mainly salt-tolerant coastal species (Table 8).

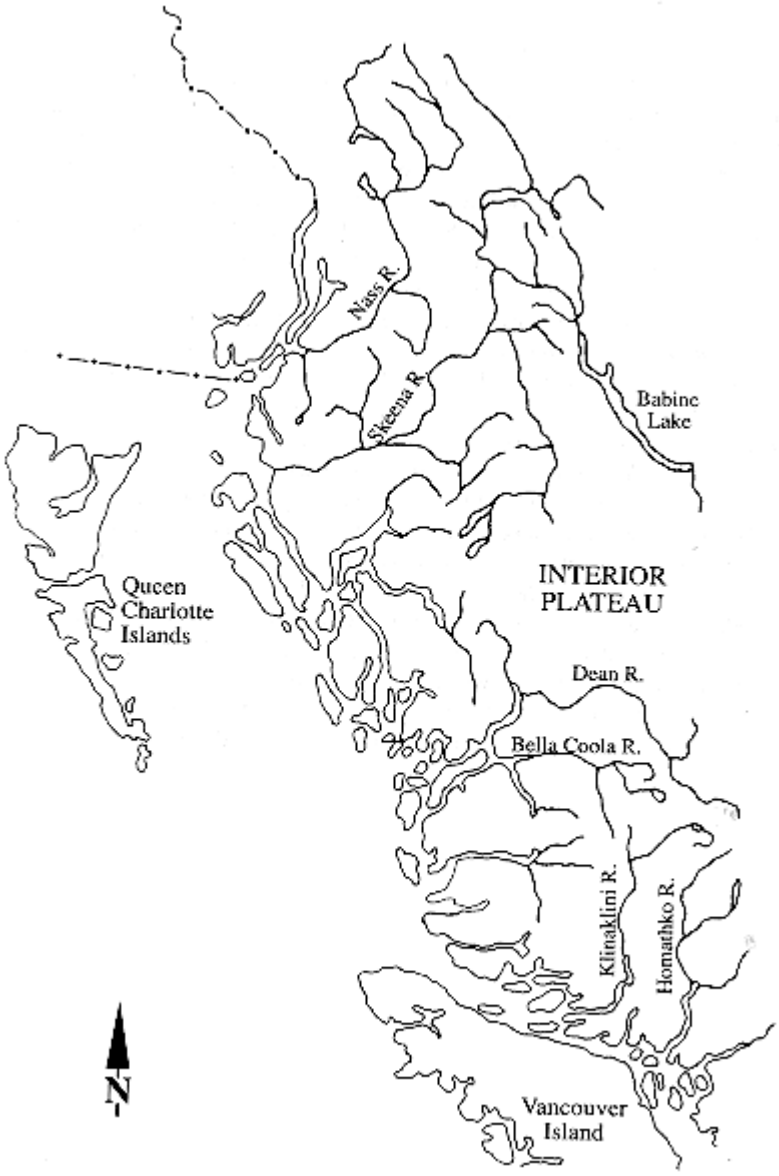


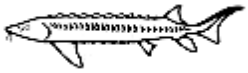
Figure 9
Central coast river systems

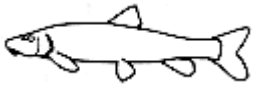
Species	Skeena	Nass	Dean	Bella Coola	Klinaklini	Homathako
Lampetra ayresi	+	?	?	?	?	?
L. richardsoni	+	?	?	+	?	?
L. tridentata	+	+	+	+	+	+
Acipenser medirostris	+	+	?	?	?	?
A. transmontanus	?	?	?	?	?	?
Alosa sapidissima	**I**	**I**	**I**	**I**	**I**	**I**
Couesius plumbeus	+	+	+	-	-	-
Mylocheilus caurinus	+	+	+	+	+	?
Ptychocheilus oregonesis	+	+	+	-	+	-
Rhinichthys cataractae	+	-	?	+	+	-
Richardsonius balteatus	+	+	+	+	+	+
Catostomus catostomus	+	+	+	+	+	+
C. commersoni	+	-	-	-	-	-
C. macrocheilus	+	+	+	?	+	-
Osmerus dentex	?	?	?	?	?	?
Spirinchus thaleichthys	+	?	?	?	?	?
Thaleichthys pacificus	+	+	+	+	+	+
Oncorhynchus clarki clarki	+	+	+	+	+	+
O. gorbuscha	+	+	+	+	+	+
O. keta	+	+	+	+	+	+
O. kisutch	+	+	+	+	+	+
O. mykiss	+	+	+	+	+	+
O. nerka	+	+	+	+	+	+
O. tshawytscha	+	+	+	+	+	+
Salvelinus confluentus	+	+	+	+	+	+
S. malma	+	+	+	+	+	+
S. namaycush	+	-	-	-	-	-
Coregonus clupeaformis	+	-	-	-	-	-
Prosopium coulteri	+	-	-	-	-	-
P. williamsoni	+	+	+	+	+	+
Lota lota	+	+	-	-	-	-
Gastersteus aculeatus	+	+	+	+	+	+
Cottus aleuticus	+	+	+	+	+	+
C. asper	+	+	+	+	+	+
Leptocottus armatus	**E**	**E**	**E**	**E**	**E**	**E**
Platichthys stellatus	**E**	**E**	**E**	**E**	**E**	**E**

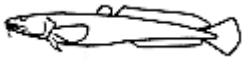
Table 8
Distribution of fishes in Central coast drainages.

+ = present - = absent	**I** = introduced ? = uncertain record	**E** = estuarine

Pictorial Key to Families

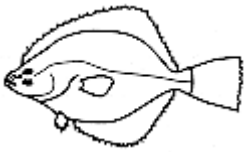






Pictorial Key to Families

SCULPINS (COTTIDAE) 187

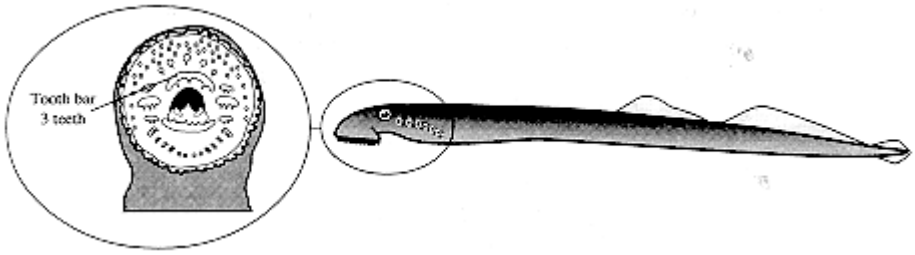


FLOUNDERS (PLEURONECTIDAE) 189

LAMPREYS
FAMILY PETROMYZONTIDAE

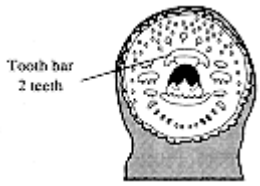
1 (6) Mouth in form of a sucking disk; teeth and eyes present

adult or transforming lampreys
2



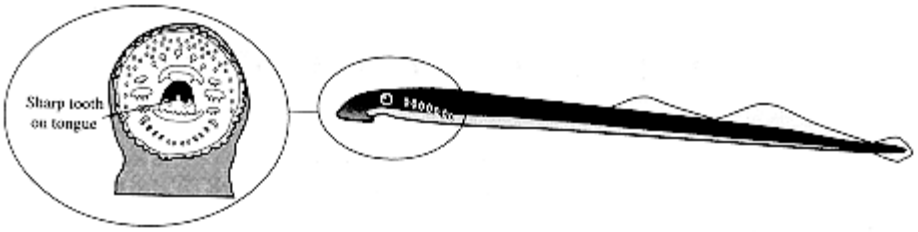
2 (3) Tooth bar immediately above mouth has three teeth; spawning adults ascend most central coast rivers in the late spring

Pacific lamprey
Lampetra tridentata



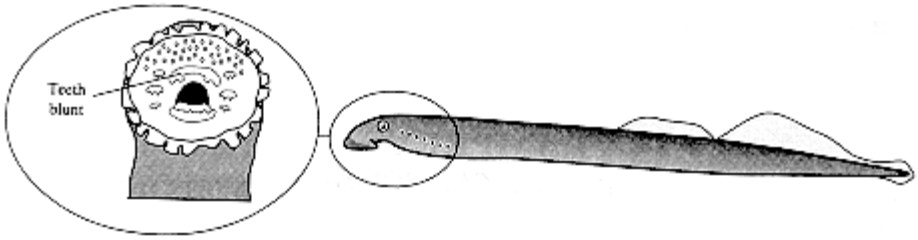
3 (2) Tooth bar immediately above mouth has two teeth

4



4 (5) Teeth sharp and well developed; center pair of lateral teeth with three points; sharp tooth on center of tongue; adults usually longer than 200 mm; on the central coast known only from the lower Skeena but probably more widely distributed

River lamprey
Lampetra ayresi



5 (4) Teeth blunt, poorly developed; center pair of side teeth with only two points; no sharp tooth on tongue; adults usually less than 160 mm; on the central coast known from the lower Skeena and King Island (near Bella Coola)

Western brook lamprey
Lampetra richardsoni

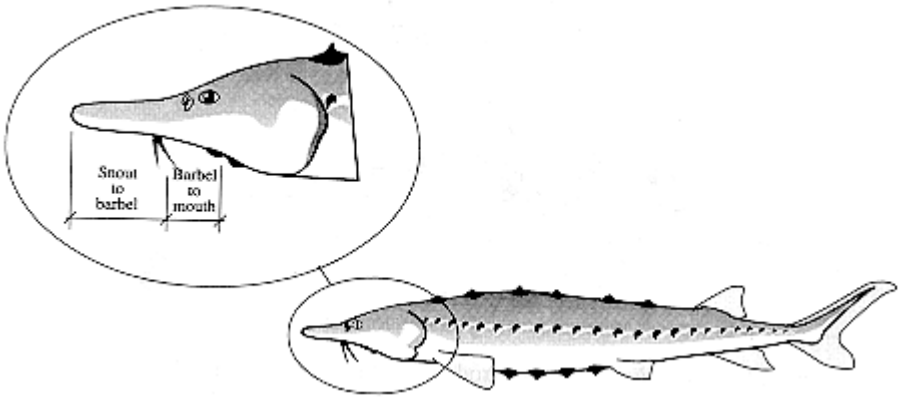
6 (1) Eyes absent or poorly developed; teeth absent; mouth not modified into a sucking disk

Ammocoetes or larval lampreys
(see key in appendix, page 199).

STURGEONS

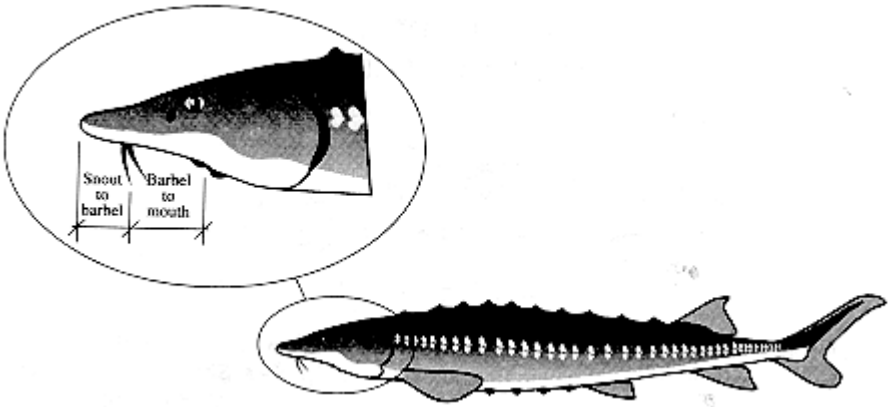
FAMILY ACIPENSERIDAE

Two species of sturgeon are reported from river mouths along the central coast (green sturgeon and white sturgeon). Both of these species are morphologically variable and, perhaps some of this variability is associated with sex. We know little about sturgeon life histories along the coast, but in other areas white sturgeon are mainly found in fresh water while green sturgeon are more common in the sea. Since all coastal records are from tidal waters, and the only verified specimens are all green sturgeons, the records of white sturgeon from the central coast may be errors. Nonetheless, we've included both species in the key.



1 (2) Back green; snout usually elongate and narrow; barbels nearer to mouth than to tip of snout; sporadic in tidal regions associated with the Skeena and Nass estuaries

Green sturgeon
Acipenser medirostris

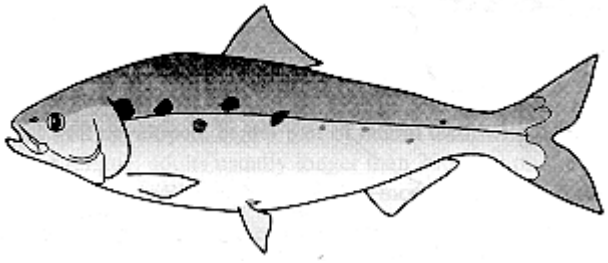


2 (1) Back dark grey to black; snout and broad (except in some specimens less than 250 mm in standard length); barbels nearer to tip of snout than to mouth; rare, or even absent, in the lower reaches of central coast rivers

White sturgeon
Acipenser transmountanus

HERRINGS

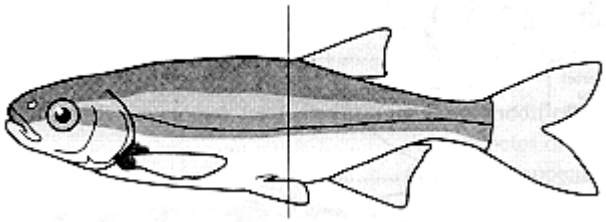
FAMILY CLUPEIDAE



The shad (*Alosa sapidissima*) was introduced to the Pacific coast of North America in 1871. It spread rapidly and by the turn of the century was recorded from the sea as far north as the Gulf of Alaska. In the early 1900's shad were recorded from a number of sites along thje central coast but there are no recent records from this area.

MINNOWS

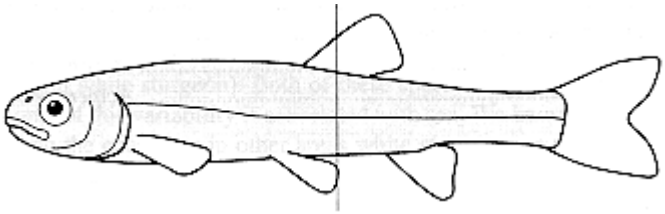
FAMILY CYPRINIDAE



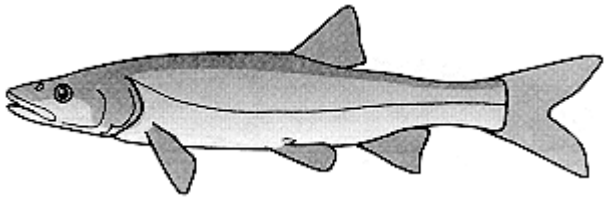
1 (2) Dorsal fin set far back on body, viewed from the side its origin is almost directly above the posterior tips of pelvic tips of pelvic fins; known from the Nass, Skeena, Klinaklini and Homathko rivers

Redside shiner

Richardsonius balteatus



2 (1) Dorsal fin originates at abut middle of the body, viewed from the side the prosterior tips of the pelvic fins extend well beyond the dorsal origin

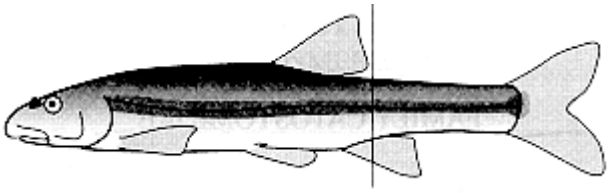


3 (4) Mouth large, upper jaw extends beyond anterior margin of eye; adults up to 450 mm; on the central coast reported from the Nass, Skeena, Dean and Klinaklini rivers

Northern squawfish
Ptychocheilus oregonenesis

4 (3) Mouth small, upper jaw does not extend beyond anterior margin of eye

5

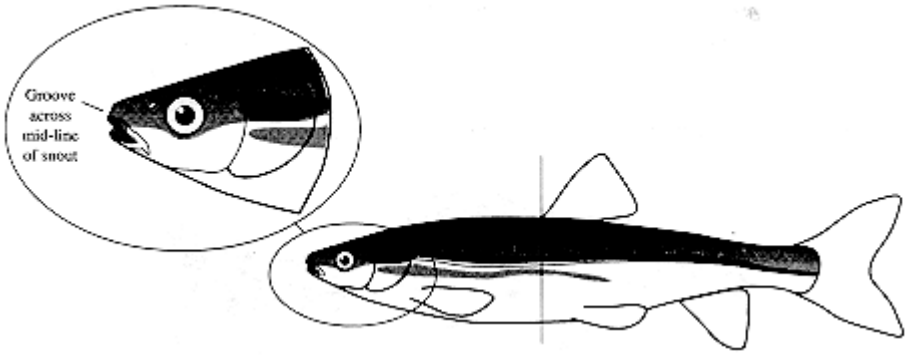


5 (6) Viewed from the side, hind margin of dorsal fin clearly overlaps anal fin; snout directly attached to upper lip; upper jaw not protractile; eyes exceptionally small, their diameter usually less than one third snout length; some individuals with a conspicuous dark lateral stripe; length usually less than 120 mm; on the central coast known from the Skeena, Klinaklini and Bella Coola rivers

Longnose dace
Rhinichthys cataractae

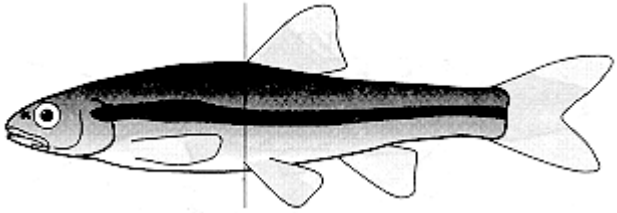
6 (5) Viewed from the side, hind margin of dorsal fin does not overlap anal fin; snout separated from upper lip by a groove across mid-line of snout; eyes normal, their diameter about half snout length

7



7 (8) Origin of dorsal fin anterior to origin of pelvic fins; two dark horizontal stripes on side of body; length to 250 mm; on the central coast known from the Nass, Skeena, Dean and Klinaklini rivers

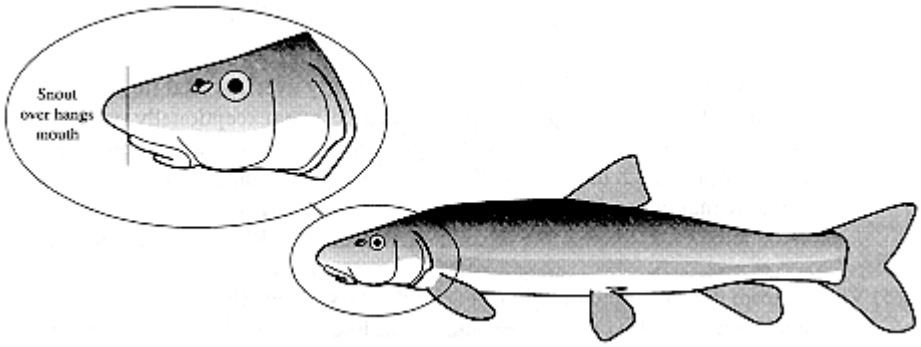
Peamouth
Mylocheilus caurinus



8 (7) Origin of dorsal fin directly above origin of pelvic fins; no dark mid-lateral stripe except in specimens less than 80 mm; adults usually less than 100 mm in length; along the central coast reported only from the Skeena and Dean rivers

Lake chub
Couesius plumbeus

SUCKERS
FAMILY CATOSTOMIDAE

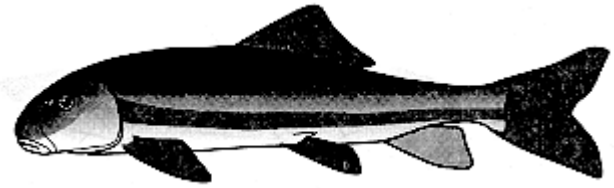


1 (2) Snout long and pointed, noticeably overhangs the mouth; scales fine (just behind the head they are barely visible with the naked eye); Nass, Skeena, Dean, Klinaklini and Homathko rivers

Longnose sucker
Catostomus catostomus

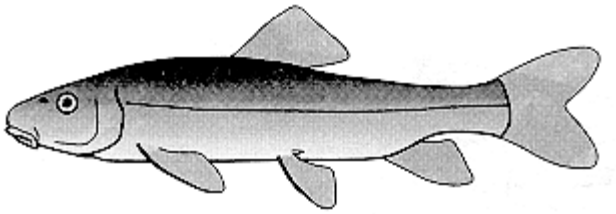
2 (1) Snout short and rounded, not overhanging the mouth; scales large

3



3 (4) Caudal peduncle narrow its least depth half, or less than half, the dorsal fin base; breeding fish with a dark lateral stripe; Nass, Skeena, Dean and Klinaklini rivers

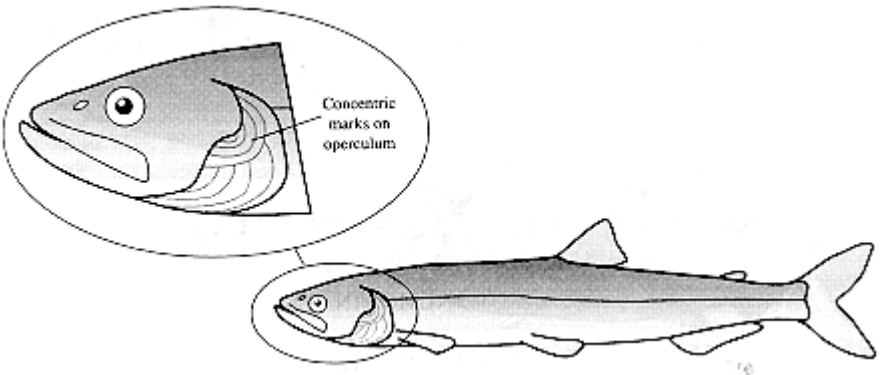
Largescale sucker
Catostomus macrocheilus



4 (3) Caudal peduncle deeper, its depth almost equal to dorsal fin base; breeding fish with a bronze cast, no dark lateral stripe; among the central coast rivers known only from the Skeena

White sucker
Catostomus commersoni

SMELTS
FAMILY OSMERIDAE

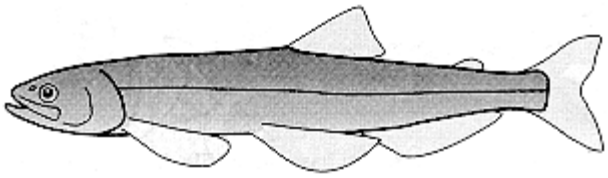


1 (2) A series of concentric marks on gill cover; in spring, large runs intro the lower reaches of most central coast rivers

Eulachon
Thaleichthys pacificus

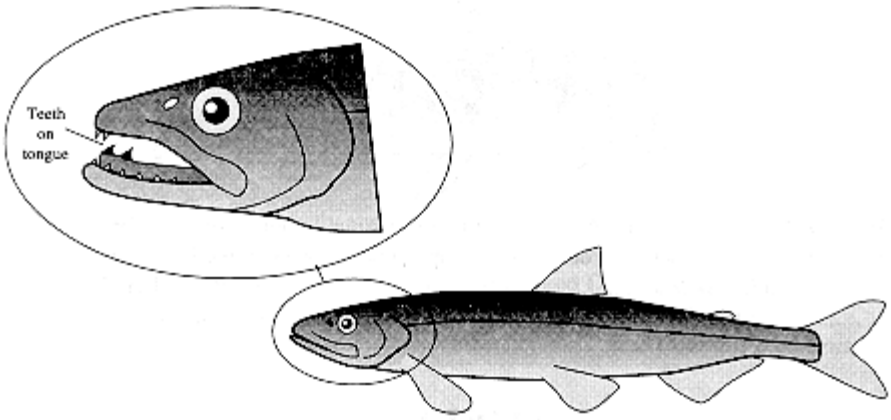
2 (1) No concentric marks on gill covers

3



3 (4) Pectoral fin longer than head; no prominent teeth on tongue; no records from freshwater on the central coast but known from the Skeena estuary and from rivers to the north and south of this area

Longfin smelt
Spirinchus thaleichthys

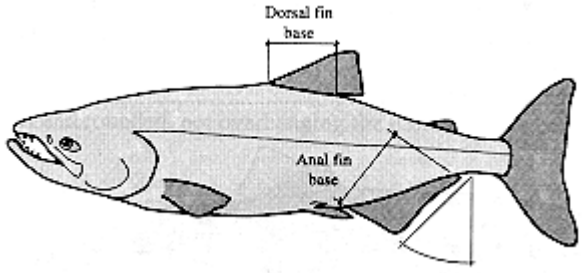


4 (3) Pectoral fin smaller than heasd; 1 to 2 promienet curved canine teeth on tongue; no records from central coast rivers but the species occurs to the north and south of this area

Rainbow smelt
Osmerus dentex

SALMON, TROUT AND CHARS
FAMILY SALMONIDAE
(SUBFAMILY SALMONINAE)

Key to the Adults

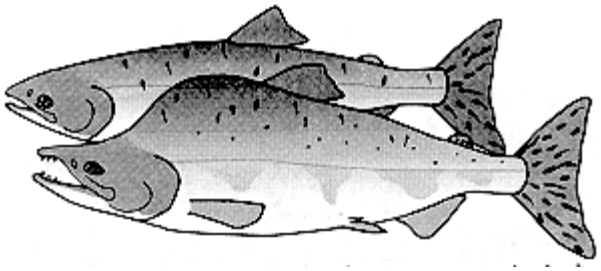


1 (10) Anal fin base longer than dorsal fin base; in profile, hind margin of anal fin slants backwards (not vertical)

2

2 (7) Distinct spots on tail

3

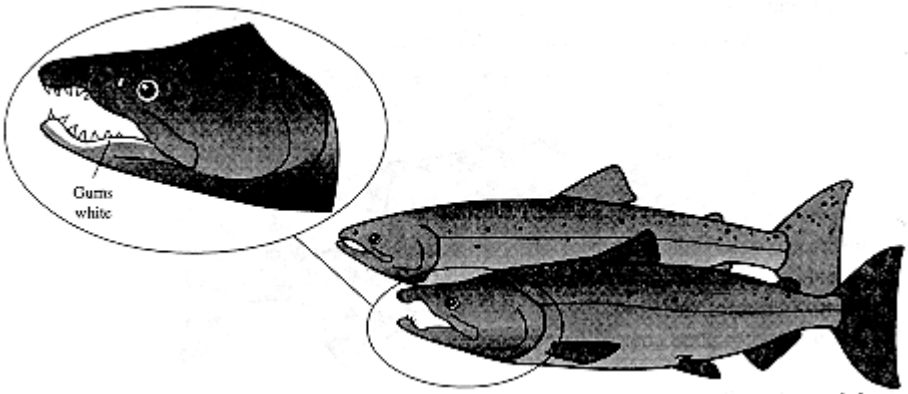


3 (4) Tail spots oblong (not round); both odd and even year runs in the lower reaches of many central coast rivers; in the Skeena system the odd year penetrates as far inland as the lower Babine river

Pink salmon
Oncorhynchus gorbuscha

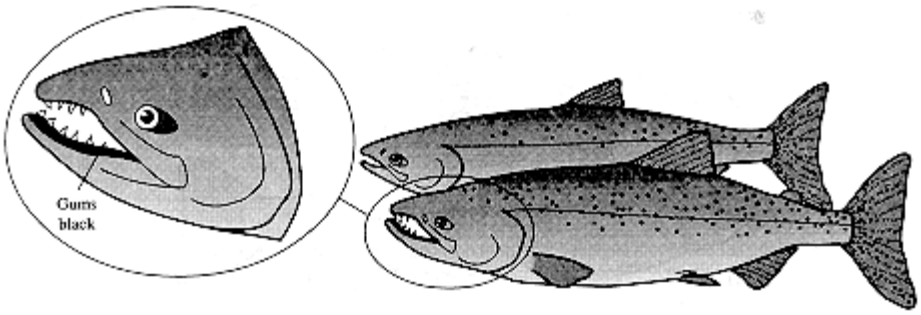
4 (3) Tail spots round (not oblong)

5



5 (6) Tail spotted on upper half; gums at base of teeth in lower jaw white; substantial runs in most central coast rivers; in the Skeena coho penetrate as far inland as the upper Babine and upper Near rivers

Coho salmon
Oncorhynchus kisutch

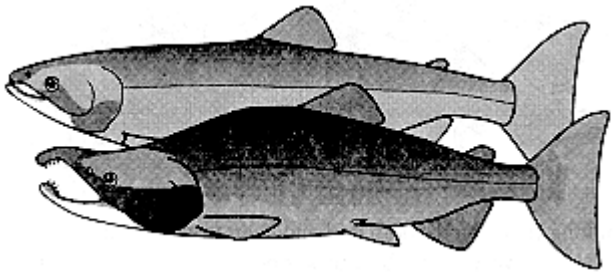


6 (5) Tail spotted on both upper and lower halves; gums at base of teeth in lower jaw black; substantial runs in most central coast rivers; in the Skeena chinook penetrate as far inland as the upper Babine and upper Bear rivers.

Chinook salmon
Oncorhynchus tshawytscha

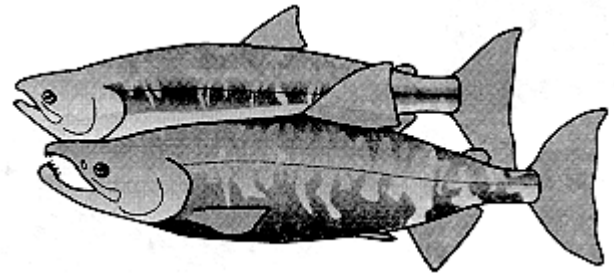
7 (2) No spots on tail, but occasionally some fine speckles

8



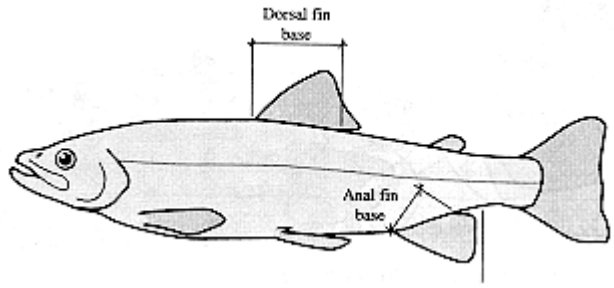
8 (9) Adults occur in fresh water both as migratory spawners (Sockeye) and as residents (Kokanee); flanks are uniformly coloured (silver in non-breeding Kokanee, usually red in breeding Sockeye and Kokanee); the Skeena and Nass rivers, as well as Owikeno and Long lakes (tributary to Rivers and Smith inlets), are the major sockeye producers on the central coast

Sockeye salmon
(Kokanee)
Oncorhynchus nerka



9 (8) Adults in fresh water only as spawners; flanks in males pale, with irregular red and black blotches, females with purplish lateral stripe; adundant in the lower reaches of central coast rivers staring in mid-July and extending into September

Chum salmon
Oncorhynchus keta

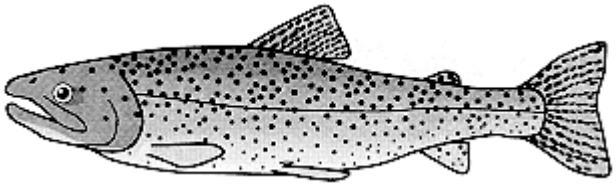


10 (1) Base of dorsal fin equal to, or longer than, anal fin base; in profile, hind margin of anal fin is vertical (no backward slant)

11

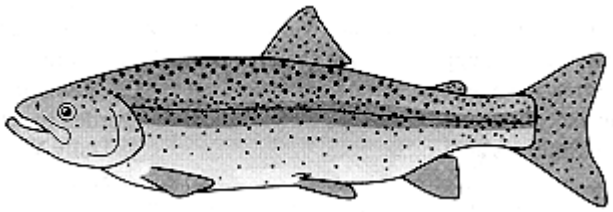
11 (14) Background colour on flanks light (silver or golden) with dark spots

12



12 (13) Red or orange slash under lower jaw; upper jaw extends back past hind margin of eye; tail usually yellowish with black spots; anumdant in the lower reaches of most central coast rivers; in the Skeena cutthroat penertrate as far inland as the upper Babine river

Coastal cutthroat trout
Oncorhynchus clarki clarki

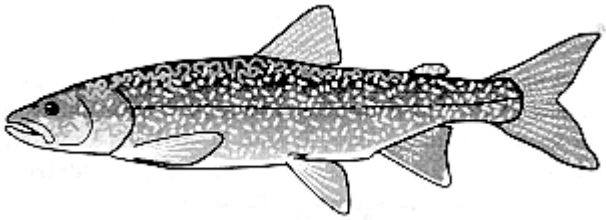


13 (12) No red or orange slash under lower jaw; except in spawning males upper jaw does not extend back beyond hind margin of eye; sides usually silver with a pink hue extending along midline; tail dusky with dark spots; resident rainbow trout are common in lakes and rivers throughout the central coast drainages; anadromous (steelhead) populations are also common, and in the Skeena penetrate to the absolute headwaters of the system

Rainbow trout
Oncorhynchus mykiss

14 (11) Background colour on sides dark with light or coloured spots

15

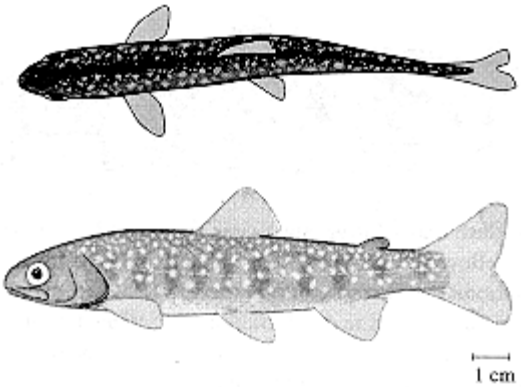


15 (16) Tail deeply forked, light coloured spots on both halves of tail; head and body covered in light irregular spots; restricted on the central coast to large lakes in the upper Skeena system

Lake trout
Salvelinus namaycush

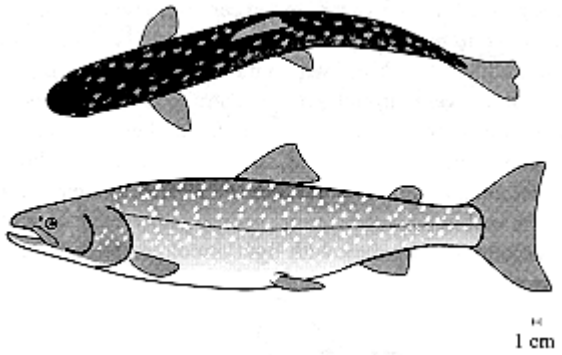
16 (15) Tail not deeply forked; usually no spots on tail, but if spots present then only on upper half of tail

17



17 (18) Viewed from the side snout is blunt; viewed from above spots on back are small and crowded together; upper jaw short (barely reaches hind margin of eye); common in the lower reaches of most central coast rivers but usually absent in their upper reaches, an exception is the Skeena system where Dolly Varden penetrate upstream as far as the Smithers area

Dolly Varden*
Salvelinus malma



18 (17) Viewed from the side snout ismore pointed; viewed from above spots on back are large and well separated; upper jaw long (reaches well past hind margin of eye); present in the headwaters of the Nass, Skeena, Dean, Bella Coola, Klinaklini and Homathko rivers

Bull trout*
Salvelinus confluentus

* These species are difficult to distinguish except where they coexist. In sympatry, Dolly Varden usually mature at less than 200 mm and typically retain parr marks into adult life; whereas, bull trout rarely mature at less than 300 mm and do not retain parr marks into adult life. On the central coast they coexist in lakes and streams in the Nass and Skeena systems. For a more rliable identification use the key in the Appendix, pages 218-219.

KEY TO YOUNG SALMONIDS (45 - 100 mm)

1 (10) Anal fin base longer than dorsal fin base; in profile, the outer margin of anal fin has a backward slant; no distinct dark spots on dorsal fin

2

2 (3) Sides silvery; no parr marks; back iridescent greenish-blue; small fish usually less than 50 mm long in fresh water

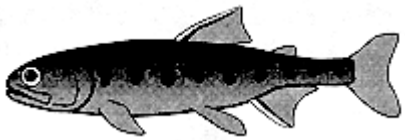
Pink salmon
Oncorhynchus gorbuscha

3 (2) Parr marks on flanks

4

4 (7) Parr marks in the form of deep bars, the largest marks deeper than the vertical eye diameter

5



5 (6) Adipose fin uniformly pigmented; parr marks variable but the spaces between marks usually wider than the marks themselves; anal fin sickle-shaped with a conspicuous white leading edge that contrasts sharply with dark pigment behind

Coho salmon
Oncorhynchus kisutch

6 (5) Adipose fin with a clear unpigmented "window"; spaces between parr marks usually wider than the marks themselves; anal fin not sickle-shaped, white leading edge not sharply contrasting with dark pigment behind

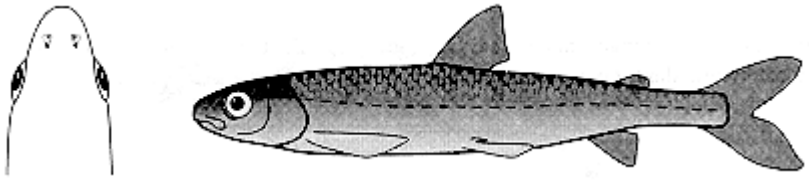
Chinook salmon
Oncorhynchus tschawytscha

7 (4) Parr marks small, oval shaped, none much higher than the vertical diameter of the eye

8

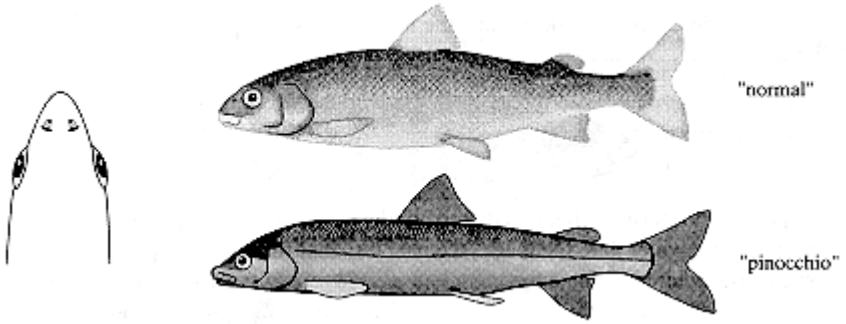
8 (9) Size in fresh water to over 100 mm; parr marks divided roughly in half by mid-line; combined width of parr marks much less than half the combined width of light areas along the side; no greenish iridescence on sides bewlow mid-line

Sockeye salmon
(Kokanee)
Oncorhynchus nerka



3 (4) Viewed from above, snout blunt, rounded; adipose fin small, base about equal to eye; on the central coast known only from the Skeena system

Pygmy whitefish
Prosopium coulteri

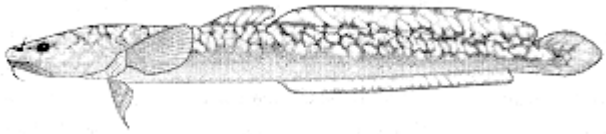


4 (3) Viewed from above, snout poined; adipose fin large, more than 1.5 times eye diameter; Nass, Skeena, Dean, Bella Coola, Klimaklini and Homoathko systems

Mountain whitefish*
Prosopium williamsoni

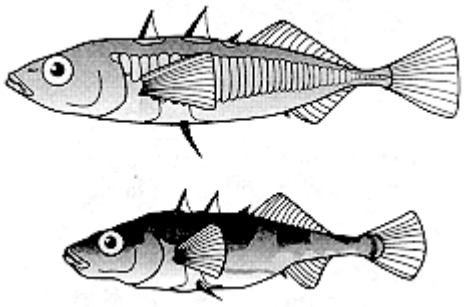
* Fluvial populations often contain two body forms: normal and "pinocchio". The "pinocchio" form has a longer snout and thinner body than the normal form.

CODS
FAMILY GADIDAE



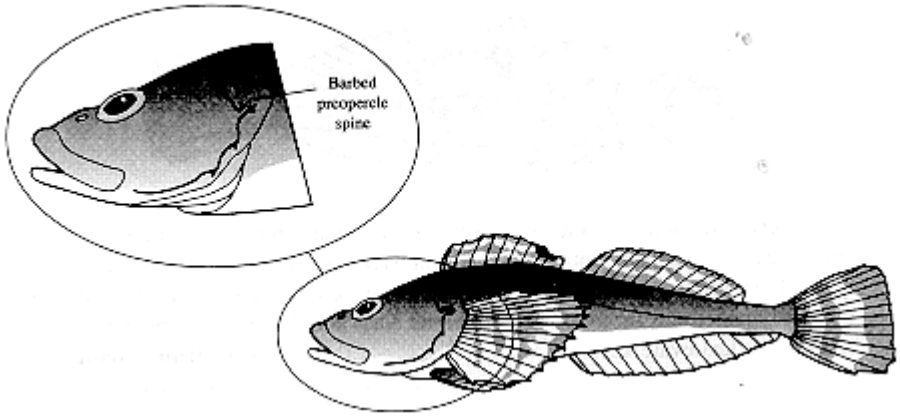
On the central coast, the burbot (*Lota lota*) occurs in lakes in the Nass and Skeena systems.

STICKLEBACKS
FAMILY GASTEROSTEIDAE



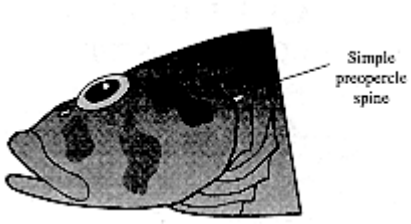
The threespine stickleback is abundant in estuaries, the lower reaches of streams and in lowland lakes throughout the central coast. Usually, it does not penetrate more than 100 km inland. On the central coast the threespine stickleback (*Gasterosteus aculeatus*) occurs in two genetically different life-history forms: a migratory form that lives most of its life in the sea but ascends fresh water in the spring to spawn, and a form that is a permanent resident of freshwater.

SCULPINS
FAMILY COTTIDAE



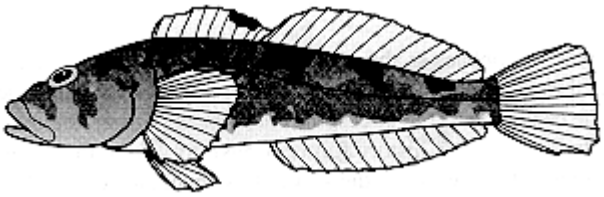
1 (2) Underside dead white; spine on preopercle with obvious hooks; pectoral fins with alternating yellow and dark bands of approximately equal width; only in estuaries or areas under tidal influence

Pacific staghorn sculpin
Leptocottus armatus



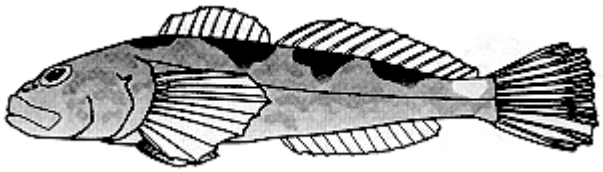
2 (1) Underside light or dusky but not dead white; spine on preopercle simple; pectoral fins speckled without broad dark bands; rivers, streams, lakes and estuaries

3



3 (4) First dorsal fin with a conspicuous black spot; anal fin base distincly longer thjan head length; common along the entire central coast; in streams, typically in quiet water; common in lakes and estuaries; in the Skeena the prickly sculpin penetrates to the headwaters of the system

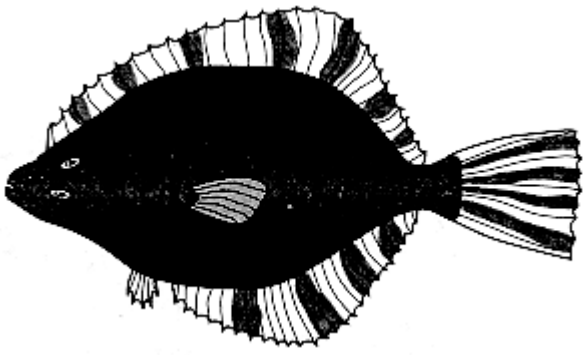
Prickly sculpin
Cottus asper



4 (3) First dorsal fin without a conspicuous black spot; anal fin base about equal to head legnth; usually a conspicuous light mark on back just in front of caudal fin; adults typically in riffles, although occasionally in lakes; common along the central coast but rarely penetrates far inland except in the Nass and Skeena systems where it reaches the headwaters

Coastrange sculpin
Cottus aleuticus

FLOUNDERS
FAMILY PLEURONECTIDAE



The starry flounder (Platichthys stellatus) is common in estuaries along the central coast, but rarely penetrates rivers much above tide-waters.

APPENDIX

Key for use on Preserved Specimens

(Includes all families and species known from BC freshwaters)

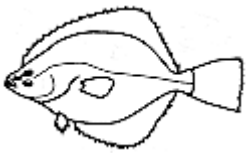
Key to Families

1 (2) Paired fins absent (no pectoral or pelvic fins); mouth in the form of a sucking disk; seven external gill openings

Lampreys
(PETROMYZONTIDAE)

2 (1) Paired fins present; mouth with normal jaws; a single external gill slit

3



3 (4) Body flat; eyes on same side of head

Flounders
(PLEURONECTIDAE)

4 (3) Body normal; eyes normal, one on each side of head

5

5 (6) Tail heterocercal (upper lobe much longer than lower lobe); scales in the form of bony scutes arranges in widely separated rows on back and sides

Sturgeons
(ACIPENSERIDAE)

6 (7) Tail no heterocercal; scales either normal or absent

7

7 (18) Adipose fin present

8

8 (9) Body without scales; 4 pairs of long barbels around mouth

Catfish
(ICTALURIDAE)

9 (8) Body with scales; no barbels around mouth

10

10 (11) Tips of pectoral fins extend well past origin of pelvic fins

Trout-perches
(PERCOPSIDAE)

11 (10) Tips of pectoral fins do not reach origin of pelvic fins

12

12 (17) Axillary process (small, fleshy spear-like tab at base of pelvic fin) present

13

13 (14) Dorsal fin base large, dorsal origin in front of posterior tips of pectoral fins

Graylings
(SALMONIDAE; SUBFAMILY THYMALLINAE)

14 (13) Dorsal fin base small, dorsal origin is well behind posterior tips of pectoral fins

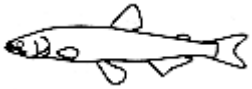
15

15 (16) Scales small, difficult to count with nakedeye; well developed teeth in jaws.

Salmon, Trout, Chars
(SALMONIDAE; SUBFAMILY SALMONINAE)

16 (15) Scales large, could be counted with naked eye; teeth in jaws absent or very weakly developed

Whitefish
(SALMONIDAE; SUBFAMILY COREGONINAE)



17 (12) No axillary process at base of pelvic fins

Smelts
(OSMERIDAE)

18 (7) Adipose fin absent

19

19 (20) Separate spines (usually 3 or more) in front of soft dorsal fin

Sticklebacks
(GASTEROSTEIDAE)

20 (19) Spines in dorsal fin not separate but interconnected by a continuous membrane

21

21 (26) Two or more spines (may be soft spines) clearly visible in dorsal fin

22

22 (25) Body covered with ctenoid (rough to the touch) scales; 2 or more spines in anal fin; dorsal spines strong, sharp to the touch.

23

23 (24) Two dorsal fins (spinous and soft dorsals separated at their base)

Perches
(PERCIDAE)

24 (23) One dorsal fin (it may be indented); anal fin with 3 to 9 spines

Sunfish, Bass
(CENTRARCHIDAE)

25 (22) Body without scales (small prickles may be present); no spines in anal fin; dorsal spines weak, soft to the touch

Sculpins
(COTTIDAE)

26 (21) No spines in dorsal fin (except for 1 inthe carp)

27

27 (28) Scales on the belly in the form of a sharp saw-like keel

Herrings, Shad
(CLUPEIDAE)

28 (27) Scales on belly normal (no saw-like keel)

27

29 (30) anal fin base more than twise as long as dorsal fin base

Goldeye
(HIODONTIDAE)

30 (29) Anal fin base less than twice as long as dorsal fin base

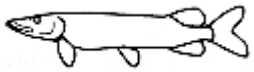
31

31 (32) Teeth in jaws

34

32 (33) Dorsal and anal fin bases long (at least half the length of the body); single barbel at tip of chin

Cods
(GADIDAE)

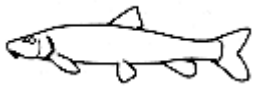


33 (32) Dorsal and anal fin bases short (much less than half the body length); snout shaped like a duck's bill

Pike
(ESOCIDAE)

34 (31) No teeth in jaws

35



35 (36) Mouth turned down; lips thick, covered with tiny papillae; distance from snout to anus over 2.5 times distance from anus to caudal fin base

Suckers
(CATOSTOMIDAE)

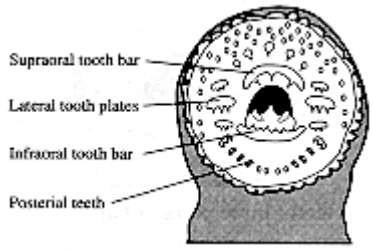
36 (35) Mouth usually not turned down; lips thin, without tiny papillae; distance from snout to anus less than 2.5 time distance from anus to caudal fin base

Minnows
(CYPRINIDAE)

LAMPREYS
FAMILY PETROMYZONTIDAE

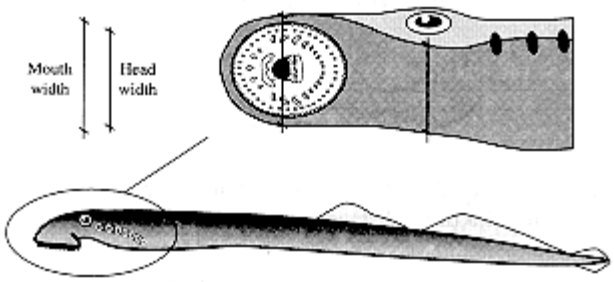
1 (8) Mouth forms a sucking disk; teeth present; eyes present

adult or transforming lampreys
2



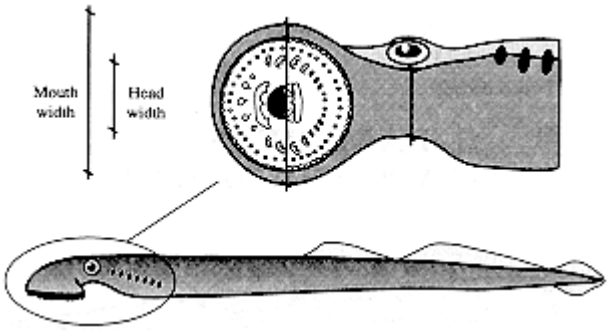
2 (5) Supraoral tooth bar with three teeth; four pairs of lateral tooth plates; semicircular row of small teeth below infraoral tooth bar; length up to 500 mm

3



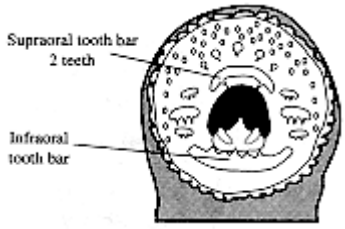
3(4) Diameter of mouth not noticeably wider than head or body; usually anadromous

Pacific lamprey
Lampetra tridentata



4 (3) Diameter of mouth noticeably wider than head; a parasitic, freshwater lamprey known only from Cowichan and Mesachie lakes on Vancouver Island

Cowichan lamprey
Lampetra macrostoma

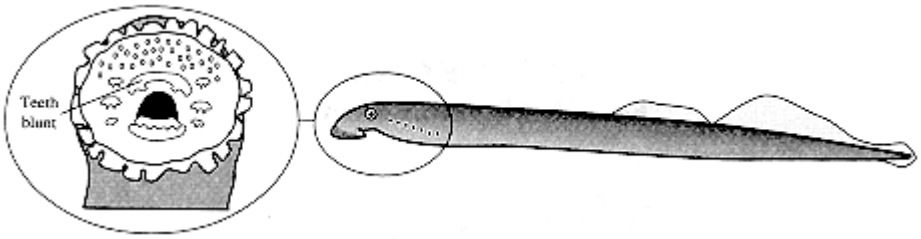


5 (2) Supaoral tooth bar with two teeth; three pairs of lateral tooth plates; no semi-circular row of small teeth below infraoral tooth bar

6

6 (7) Teeth sharp and weel developed; center pair of lateral teeth with three points; parasitic and anadromous

River lamprey
Lampetra ayresi

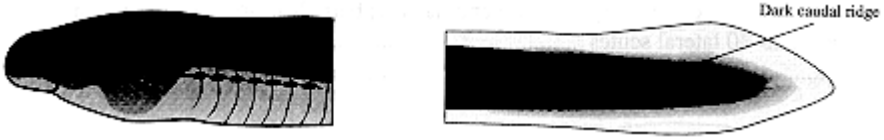


7 (6) Teeth blunt, poorly developed; center pair of lateral teeth with only two points; non-parasitic, permanent resident in fresh water

Western brook lamprey
Lampetra richardsoni

8 (1) Eyes poorly developed; teeth absent; mouth not modified into a sucking disk...untransformed lampreys (ammocoetes)* 9

9 (12) Extensive dark pigment on head and body; area surrounding precursor of tongue has moderate to heavy dark pigmentation 10



10 (11) Uniform dark pigmentation on caudal ridge of tail

Western brook lamprey
Lampetra richardsoni

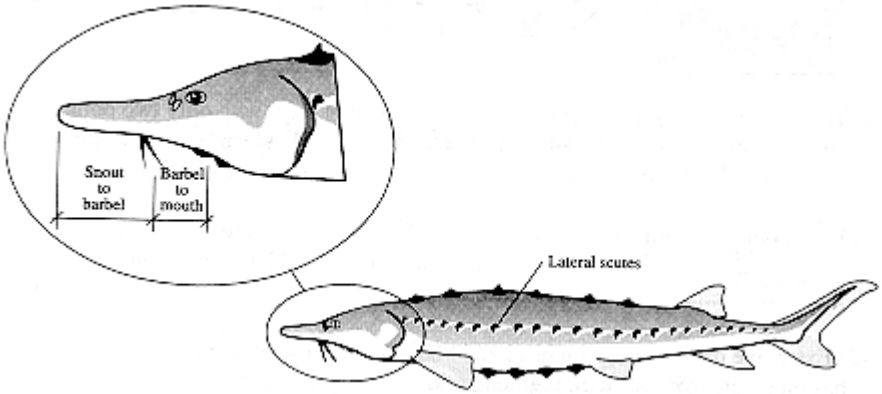
11 (10) Caudal ridge of tail lightly pigmented, pigment not uniformly distributed across caudal ridge
*Lampetra tridentata or Lampetra mascrostoma***

12 (9) Head (prebranchial, branchial and suborbital regions) lightly pigmented; a conspicuous thin dark streak radiating anteriorly and posteriorly from eye spot area surrounding precursor of tongue structure unpigmented

River lamprey
Lampetra ayresi

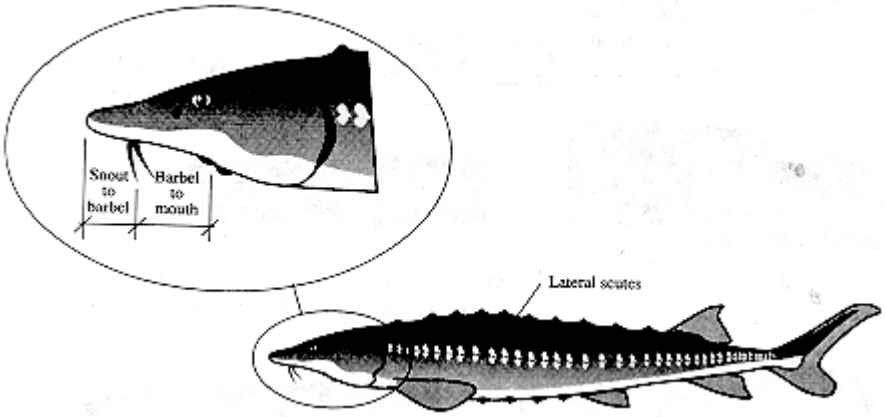
* Ammocoete key from Richards et al., 1982.
** Apparently no reliable characters have been found that distinguish ammocoetes of *L. tridentata* and *L. macrostoma*

STURGEONS
FAMILY ACIPENSERIDAE



1 (2) Back green; snout usually elongate and narrow; barbels nearer to mouth than tip of snout; 23-30 lateral scutes

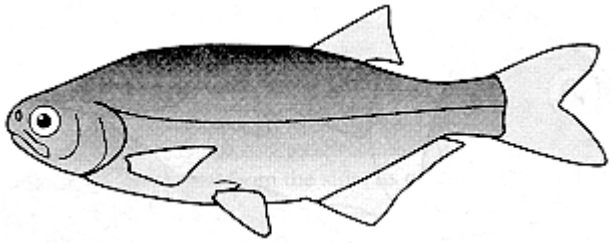
Green sturgeon
Acipenser medirostris



2 (1) Back dark grey to black; snout short and broad (except in individuals less than 250 mm. In length; barbels nearer to tip of snout than to mouth; 38-48 lateral scutes

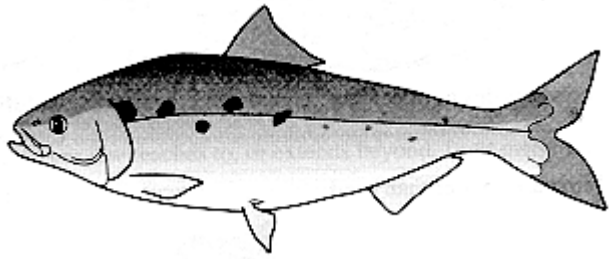
White sturgeon
Acipenser transmontanus

GOLDEYES
FAMILY HIODONTIDAE



Goldeye
Hiodon alosoides

HERRINGS
FAMILY CLUPEIDAE

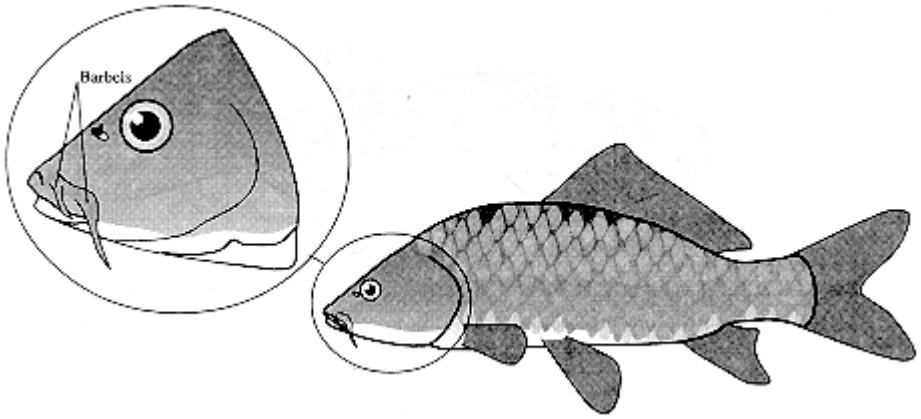


American shad
Alosa sapidissima

MINNOWS
FAMILY CYRINIDAE

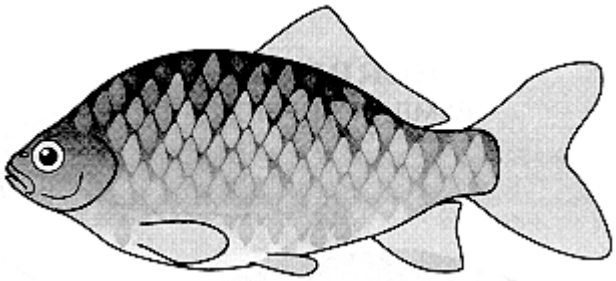
1 (4) Dorsal fin base much longer than head

2



2 (3) Two pairs of barbels on sides of upper jaw

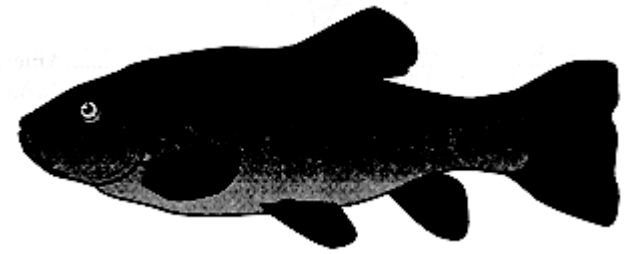
Carp
Cyrinus carpio



3 (2) No barbels on sides of upper jaw

Goldfish
Carassius auratus

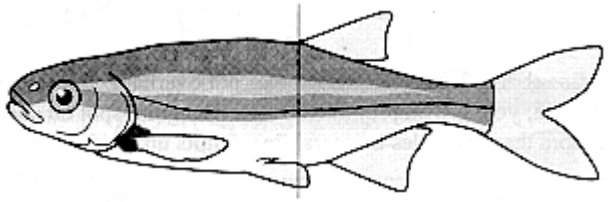
4 (1) Dorsal fin base shorter than head



5 (6) Caudal peduncle deep, its depth more than half head length; all fins dark; 93-107 scales in lateral line

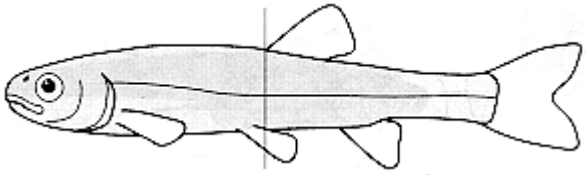
Tench
Tinca tinca

6 (5) Caudal penduncle slender, its depth less than half a head length; not all fins dark fewer than 90 scales in lateral line

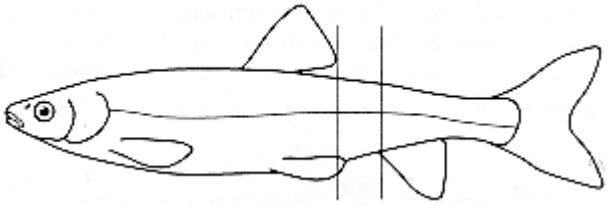


7 (6) Dorsal fin far back on body; viewed from the side, its origin is almost directly above tips of pelvic fins

Redside shiner
Richardsonius balteatus

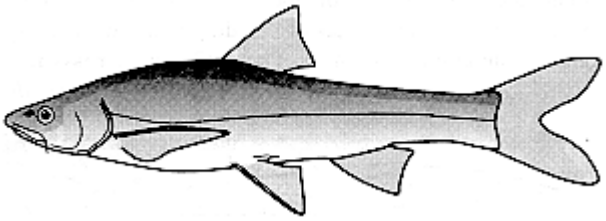


8 (7) Dorsal fin starts at mid-body; viewed from the side, tips of pelvic fins extend well past origin of dorsal fin



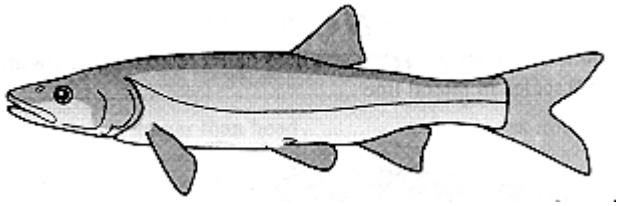
9 (16) Viewed from the side, hind margin of dorsal fin does not overlap anal fin

10 (13) Mouth large, upper jaw reaches to, or extends beyond, front margin of eye



11 (12) Outer pectoral rays long, equal to head length and nearly reaching pelvic fins; top of head flat; snout overhangs mouth; prominent barbels at corner of mouth fewer than 60 scales in lateral line

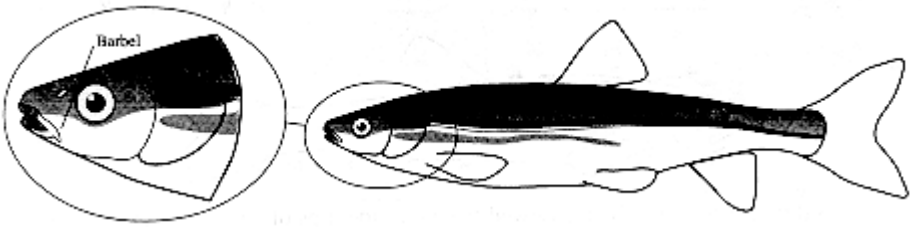
Flathead chub
Platygobio gracilis



12 (11) Pectoral fins shorter than head; snout does not overhang mouth; no barbels at corner of mouth; young with prominent black triangular spot on each end of caudal peduncle; more than 60 scales in lateral line; adults up to 450 mm

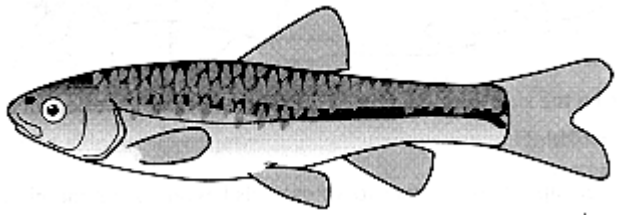
Northern squawfish
Ptychocheilus oregonensis

13 (10) Mouth small, upper jaw does not reach eye



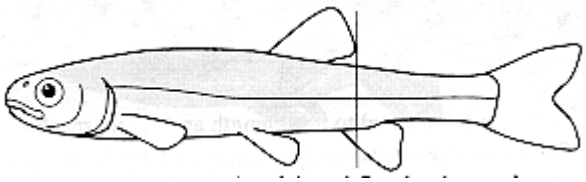
14 (15) A small barbel at the corners of mouth; mouth almost terminal; two dark horizontal stripes on the side of body; breeding adults with red lips and fin axils; more than 60 scales in lateral line; length th greater than 250 mm

Peamouth
Mylocheilus caurinus



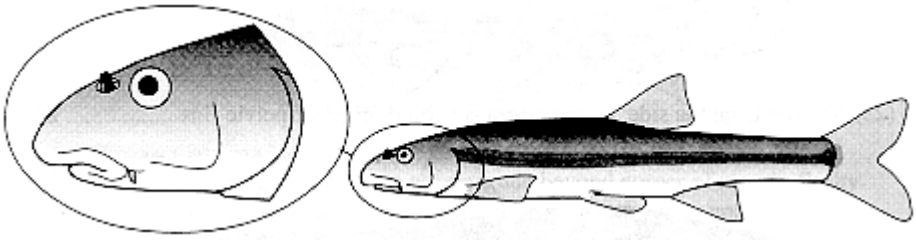
15 (14) No barbels at corner of mouth; snout overhangs mouth; no continuous horizontal bands, although there may be an indistinct dark band running from back of dorsal fin to the beginning of the tail; flanks of breeding males with brassy cast; fewer than 45 scales in lateral line; length less than 200 mm

Brassy minnow
Hybognathus hankinsoni



16 (9)Viewd from the side, hind margin of dorsal fin clearly overlaps anal fin

17 (20) Snout directly attached to upper lip, no groove separating snout from upper lip; upper jaw not protractile

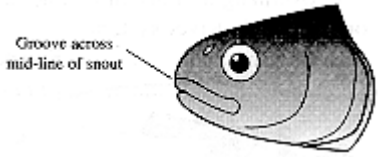


18 (19) Lateral line scales 58-70 (usually more than 60)

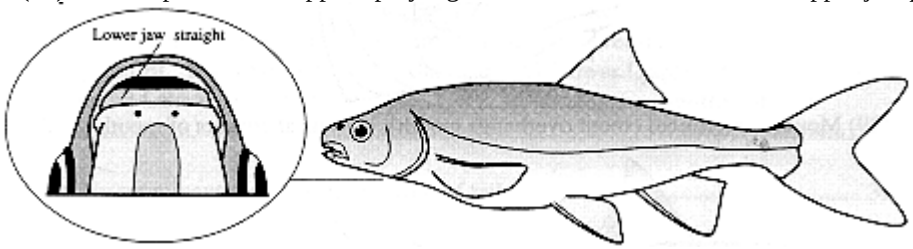
Longnose dace
Rhinichthys cataractae

19 (20) Lateral line scales (usually fewer than 58)

Nooksack dace
Rhinichthys. Sp.



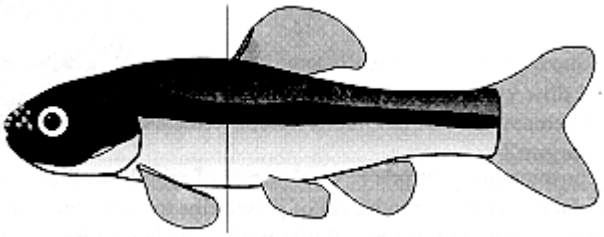
20 (17) Snout separate from upper lip by a groove across mid-line of snout; upper jaw protractile



21 (22) Lower jaw chisel-like, nearly straight in adults; 9-10 anal rays

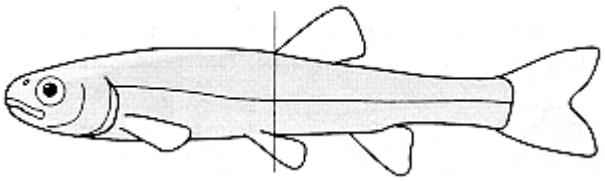
Chiselmouth
Acrocheilus alutaceus

22 (21) Lower jaw normal; 7 or 8 anal rays

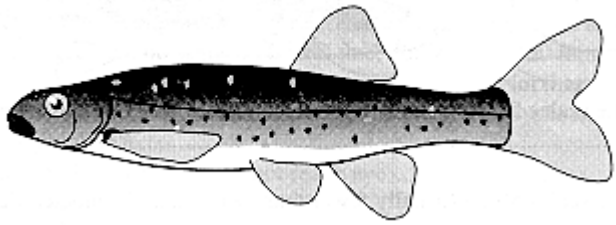


23 (24) Viewed from the side, dorsal origin is directly above, or slightly in front of origin of pelvic fins

Fathead minnow
Pimephales promelas

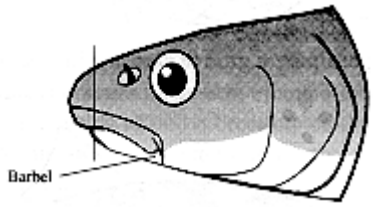


24 (23) Viewed from the side, dorsal origin is behind origin of pelvic fines

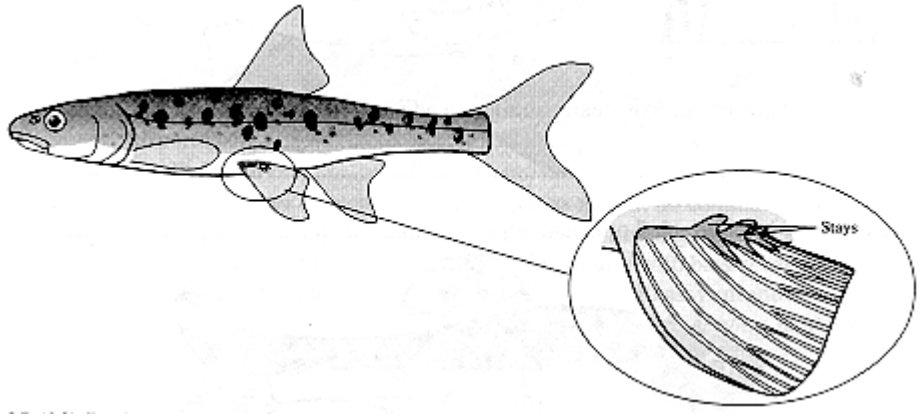


25 (26) Mouth terminal (snout does not overhang mouth); in BC, no barbels at corner of mouth; in BC, known only from the Kettle River system

Speckled dace
Rhinichthys osculus

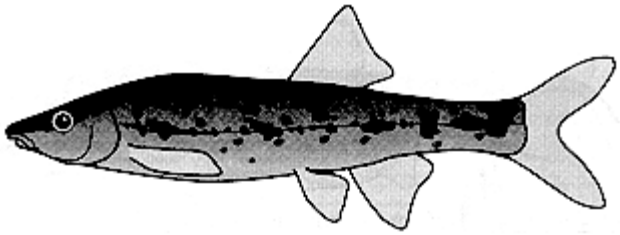


26 (29) Mouth subterminal (snout overhangs mouth); barbels at corner of mouth



27 (28) Barbels conspicuous, protrude beyond corner of mouth; well developed fleshy membranes (stays) connect inner rays of pelvic fins to body; base of pelvic fin longer than free portion of last ray; flanks with conspicuous irregular dark blotches; caudal peduncle depth only slightly wider than interorbital width; lateral line scales usually less than 60

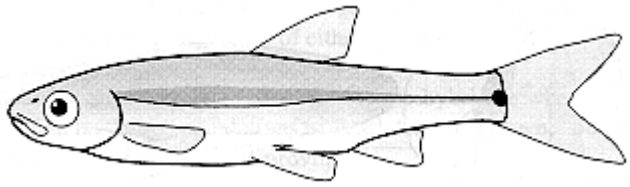
Leopard dace
Rhinichthys falcatus



28 (27) Barbels inconspicuous, they do not protrude beyond corner of mouth; fleshy membranes (stays) connecting inner rays of pelvic fins to body are not well developed; caudal peduncle depth conspicuously wider than interorbital width; lateral line scales usually more than 60

Umatilla dace
Rhinichthys umatilla

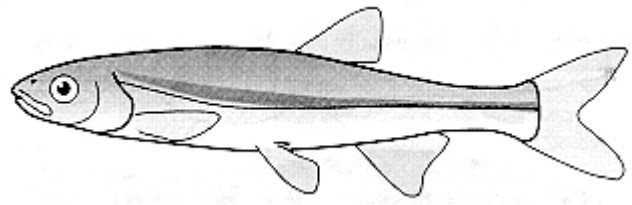
29 (26) Mouth terminal or supraterminal, snout does not overhang lower jaw



30 (31) Prominent black spot directly in front of tail fin; silver mid-lateral band; 7-8 anal rays; in BC, known only from Maxhamish Lake (lower Liard) but introduced into Charlie Lake near Fort St. John

Spottail shiner
Notropis hudsonius

31 (30) No prominent spot diorectly in front of tail

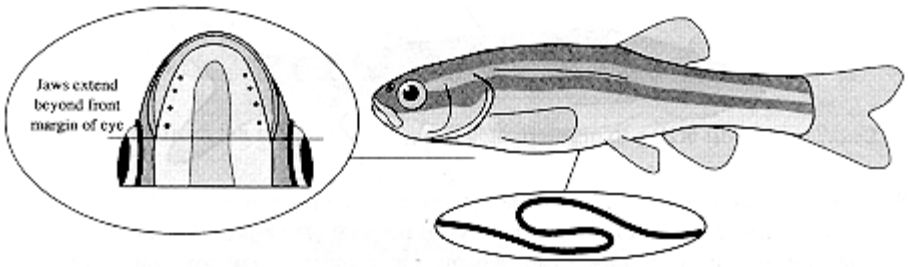


32 (33) Body yellowish silver with a prominent silver band running from back of gill cover along the sides to start of tail fin; anal fin long, usually with 11 rays (10-12); in BC, known only from a small stream about 3 km downstream of Old Fort Nelson

Emerald shiner
Notropis atherinoides

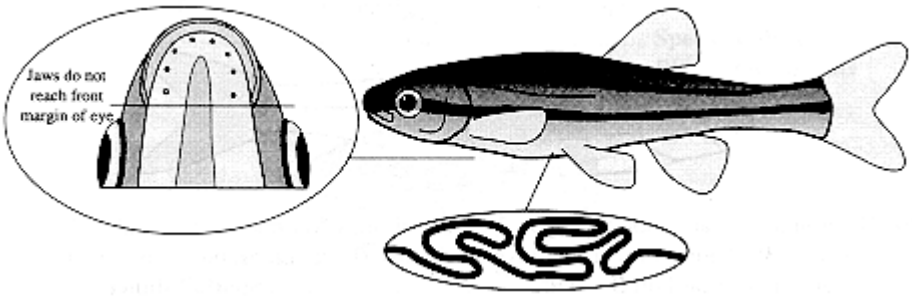
33 (32) No silver band on sides of body; anal fin short, usually with 8 rays (7-9)

34 (37) Barbels absent; lateral line incomplete; peritineum black



35 (36) Viewd from below, jaws extend beyond front margin of eye; single dark lateral stripe; intestine with a single loop

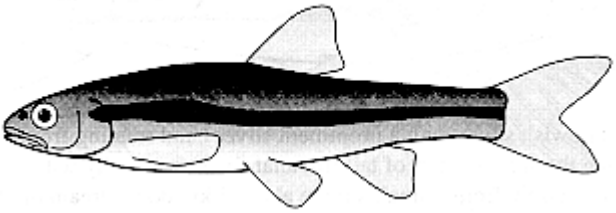
Finescale dace
*Phoxinus neogaeus**



36 (35) Viewed from below, jaws do not reach front margin of eye; two dark lateral stripes (one often indistinct); intestine with several loops

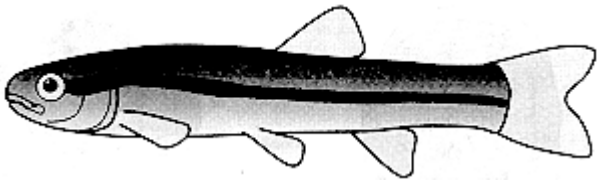
Northern redbelly dace
*Phoxinus eos**

37 (34) Barbels present; lateral line usually complete; peritoneum silvery



38 (39) Conical barbels usually visible at the posterior corner of the mouth (occasionaly missing from one or both sides); snout moderately pointed; usually fewer than 70 lateral line scales

Lake chub
Couesius plumbeus



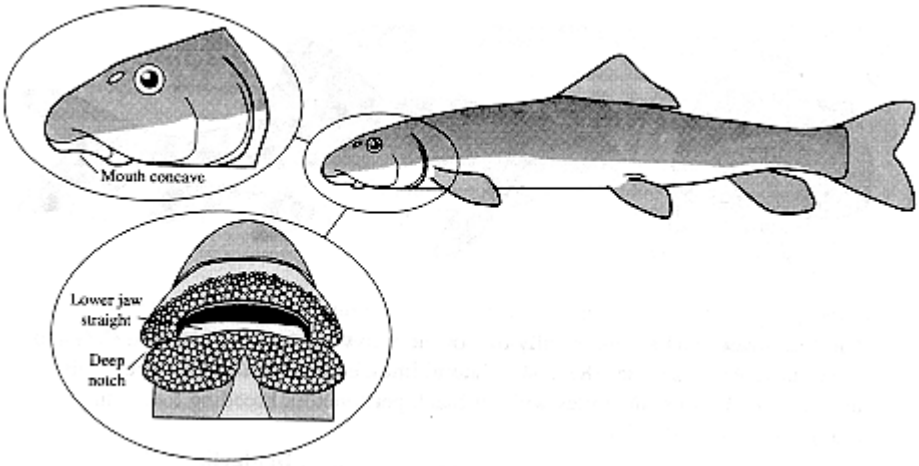
39 (38) Flap-like barbel slightly in front of corner of mouth rarely visible to naked eye (occasionally missing from one or both sides); snout blunt; usually more than 70 lateral line scales

Peal dace
*Margariscus margarita***

* Positive identification of *Phoxinus* is difficult in British Columbia. In BC, the two species hybridize extensively where they co-exist, and no "pure" population of *Phoxius eos* is known; however, *Phoxinus neogaeus* often occurs without *Phoxinus eos*. Unfortunately, *Phoxinus neogaeus* also hybridizes with *Margariscus margarita* and again, it is not clear if there are any "pure" populations of either species in BC.

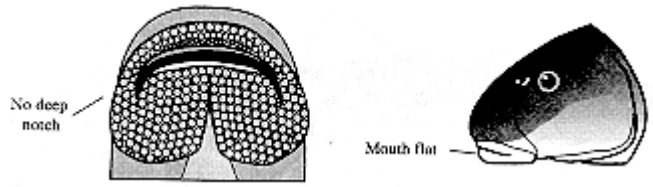
** *Couesius plubeus* and *Margariscus margarita* also hybridize wherever they coexist in BC and, although no "pure" populations of Pearl dace are known, "pure" populations of lake chub are widespread within the province.

SUCKERS
FAMILY CATOSTOMIDAE*



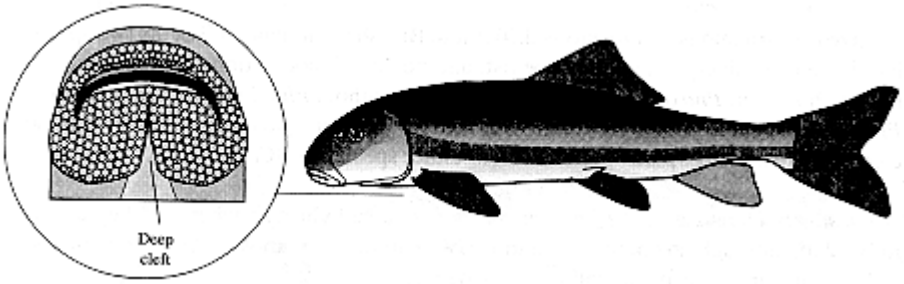
1 (2) Deep notch between upper and lower lips at corners of mouth; viewed from below lower jaw is almost straight; viewed from the side, the mouth is slightly concave; a small species (usually less than 250 mm)

Mountain sucker
Catostomus platyrhynchus



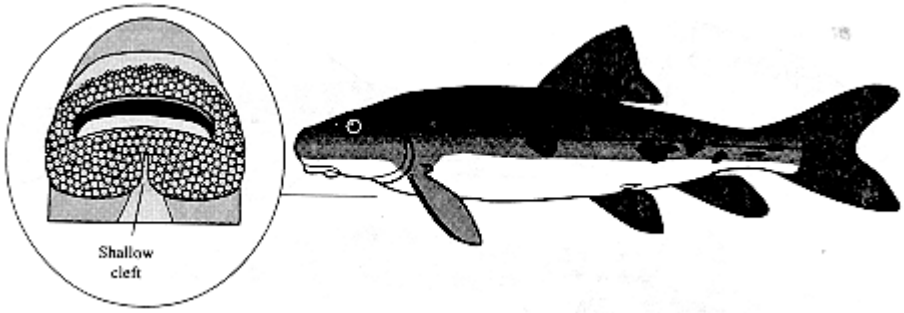
2 (1) No deep notches between upper and lower lips at outer corners of mouth; viewed from below, lower jaw is curved' viewed from the side, the mouth is flat

3 (6) Caudal peduncle narrow, its least depth half, or less than half, dorsal fin base



4 (5) Cleft in lower lip deep, usually no papillae between cleft and lower jaw; scales large (62-83 in lateral line), on adults even those near the head are clearly visible to naked eye; juveniles with light coloured peritoneum; breeding fish with a dark stripe

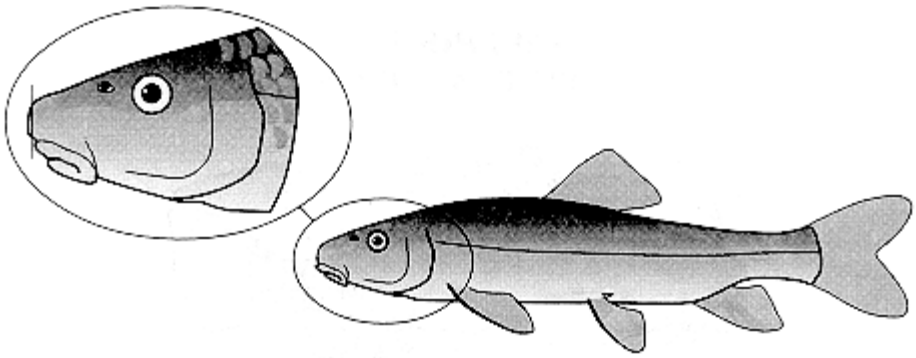
Largescale sucker
Catostomus macrocheilus



5 (4) Cleft in lower lip shallow, usually two or more rows of papillae between cleft and lower jaw; scales smaller (87-104 in lateral line), even on adults those near the head are hard to see; juveniles with jet black peritoneum; breeding fish with orangish-red lateral stripe

Bridgelip sucker
Catostomus columbianus

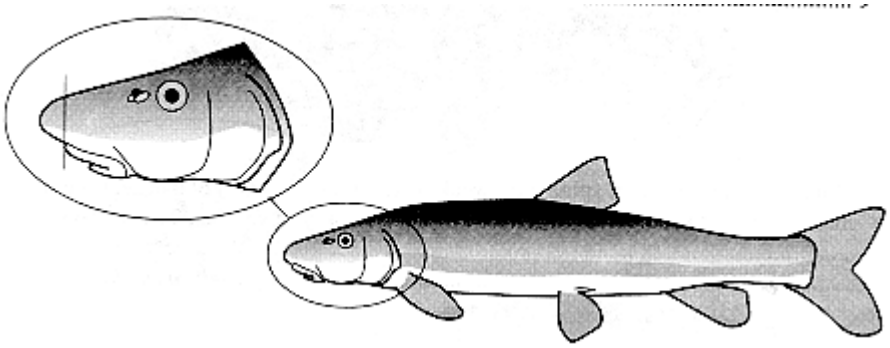
6 (3) Caudal peduncle deep, its least depth much more than half dorsal fin base



7 (8) Scales large (those behind the head clearly visible to naked eye); 60 -74 scales along lateral line, 9-11 diagonal rows of scales from front of dorsal fin to lateral line; snout short and blunt; mouth not strongly subterminal (snout barely overhangs mouth); breeding fish with a bronze cast

White sucker
Catostomus commersoni

8 (7) Scales small (those behind head are crowded, barely visible to naked eye); 90-120 scales along the lateral line, 16-21 diagonal rows of scales from front of dorsal fin to lateral line



9 (10) Snout long and pointed; mouth strongly subterminal (snout clearly overhangs mouth); mouth large, length of mouth usually much greater than eye diameter; usually more than 100 scales in lateral line

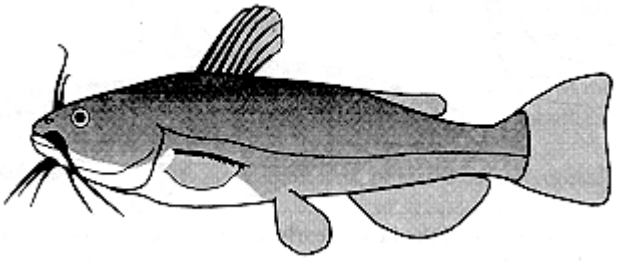
Longnose sucker
Catostomus catostomus

10 (9) Snout short and blunt; mouth not strongly subterminal (snout barely overhangs mouth); mouth extremely small, length of mouth usually about equal to eye; unusually fewer than 100 scales in lateral line

Salish sucker
Catostomomus sp.

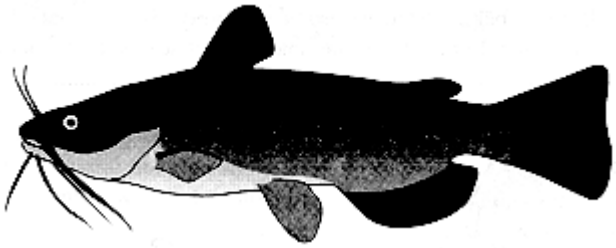
* Where they coexist in disturbed environments, sucker species often hybridize; this can make identification difficult.

CATFISH
FAMILY ICTALURIDAE



1 (2) Hind margin of pectoral spine with strong hooks near the tip; membranes between dorsal rays dusky; usually more than 21 anal rays

Brown catfish
Ameriurus nebulosus



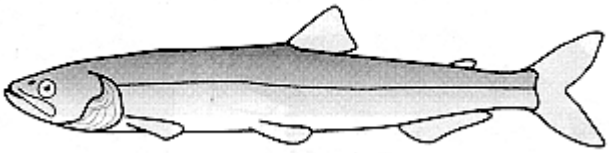
2 (1) Hind margin of pectoral spine with weak (often almost absent) hooks near the tip; membranes between dorsal rays usually black; usually fewer than 21 anal rays

Black catfish
Ameriurus melas

PIKES
FAMILY ESOCIDAE

Northern pike
Esox lucius

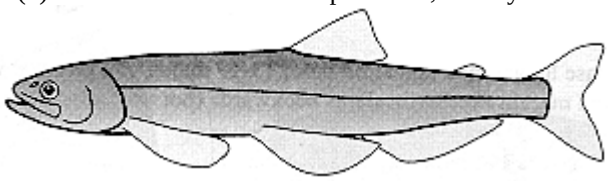
SMELTS
FAMILY OSMERIDAE



1 (2) Concentric marks on operculum; more than 70 scales in lateral line

Eulachon
Thaleichthys pacificus

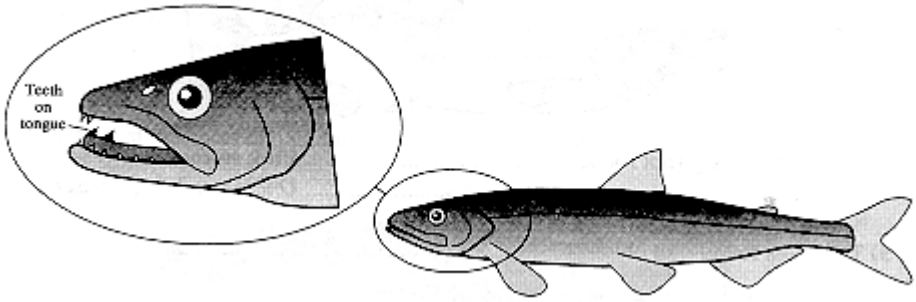
2 (1) No concentric marks on operculum; usually fewer than 70 scales in lateral line



3 (4) Pectoral and anal fins longer than head

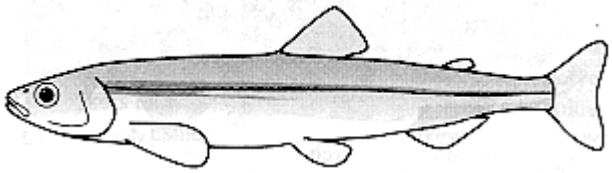
Longfin smelt
Spirinchus thaleichthys

4 (3) Pectoral and anal fins shorter than head



5 (6) One or two prominent curved canine teeth on tongue; lower jaw extends back to hind margin of eye

Rainbow smelt
Osmerus dentex

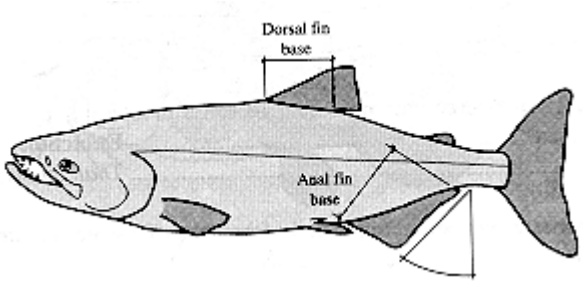


6 (5) No prominent teeth on tongue lower jaw does not extend back to hind margin of eye

Surf smelt
Hypomesus pretiosus

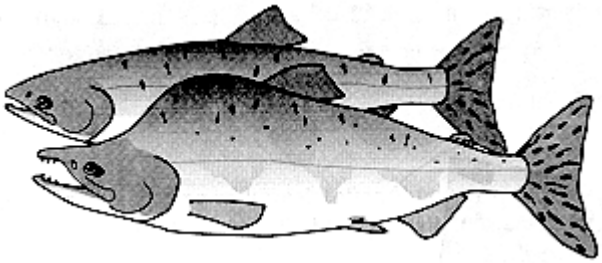
SALMON, TROUT AND CHARS
FAMILY SALMONIDAE
SUBFAMILY SALMONINAE

Key to Adults



1 (12) Adipose fin base longer than dorsal fin base; 13-19 major anal fin rays; viewed from the side, hind margin of anal fin slants backwards (not vertical)

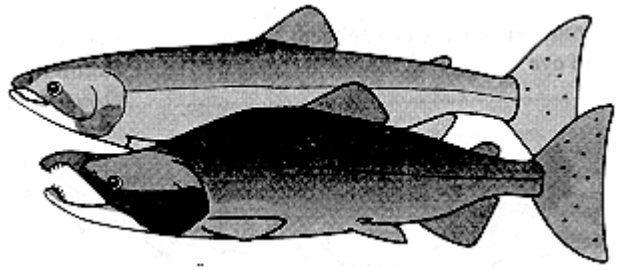
2 (9) Distinct spots on tail



3 (4) Tail spot oblng (not round)

Pink salmon
Oncorhynchus gorbuscha

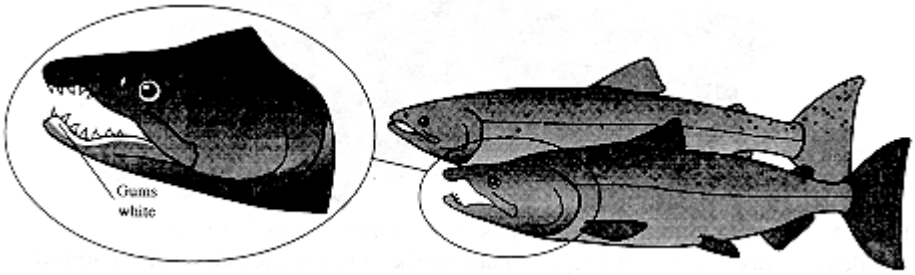
4 (3) Tail spots round (not oblong)



5 (6) Gill rakers long, 29-44 on first gill arch

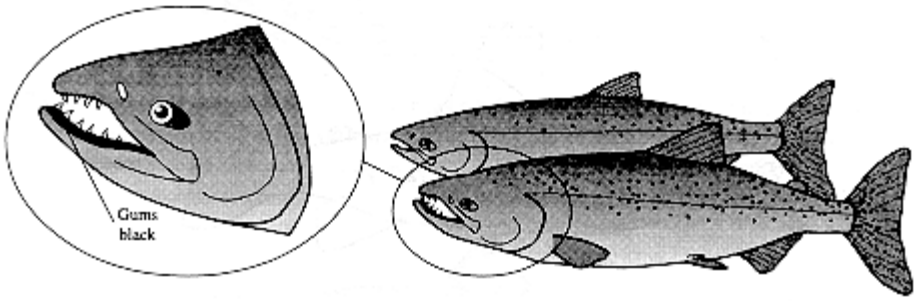
Sockeye salmon
(Kokanee)
Oncorhynchus nerka

6 (5) Gill rakers relatively short, 16-26 on fisrt gill arch



7 (8) Upper half of tail spotted; gums at base of teeth in lower jaw white

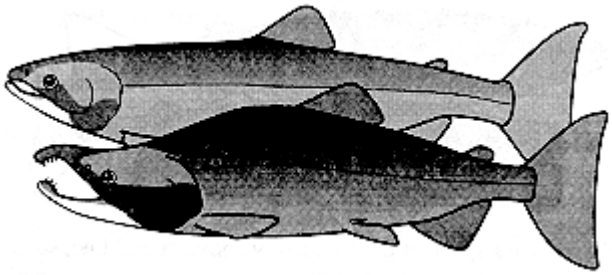
Coho salmon
Oncorhynchus kisutch



8 (7) Tail spotted on both upper and lower lobes; gums at base of lower jaw black

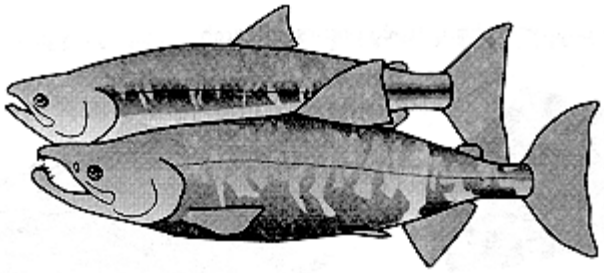
Chinook salmon
Oncorhynchus tschawytscha

9 (2) No distinct spots on tail, but occasionally fine speckles



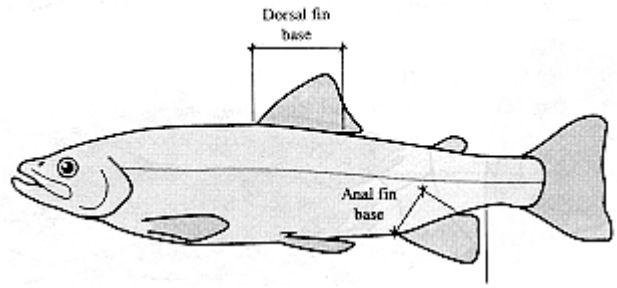
10 (11) Adults occur in fresh waters both as migratory spawners (sockeye) and residents (kokanee); gill rakers numerous (29-44); flanks are uniformly colored (silver in non-breeding kokanee, usually red in breeding sockeye and kokanee)

Sockeye salmon
(Kokanee)
Oncorhynchus nerka



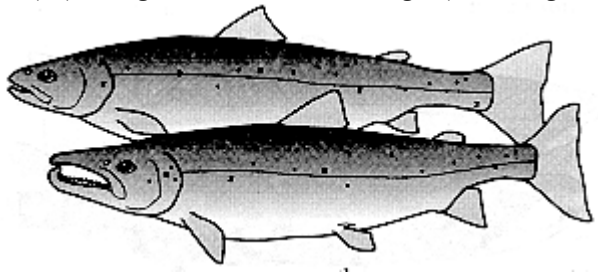
11 (10) Adults occur in fresh waters only as spawners; gill rakers less numerous (19-26); flanks in males pale with irregular red and black blotches, females with a purplish lateral strip

Chum salmon
Oncorhynchus keta



12 (1) Dorsal fin base equal to, or longer than, anal fin base; 8-12 major anal rays; viewed from the side, hind margin of anal fin is vertical (no backward slant)

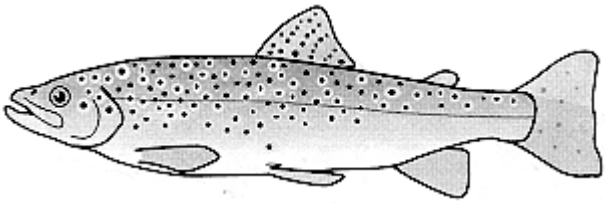
13 (19) Background colour on sides light (silver or golden) with dark spots



14 (15) Relatively few dark spots on flanks, mostly above lateral line, some spots X-shaped; spots on operculum common in returning adults; anal fin whitish; caudal fin usually without spots; spwning males with conspicuously hooked lower jaw

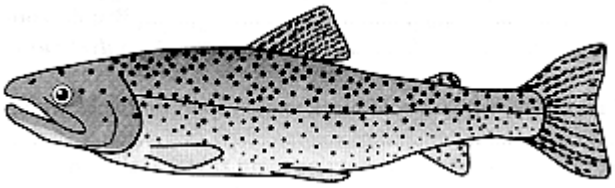
Atlantic salmon
Salmo salar

15 (16) Spots on back and sides more numerous; none X-shaped; caudal fin usually heavily spotted



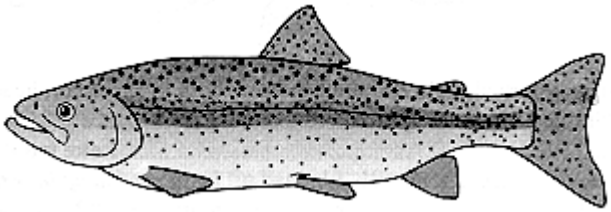
16 (17) Spots on sides mostly black but some red or orange; dark spots on sides usually surrounded by light haloes

Brown trout
Salmo trutta



17 (18) Red or orange slash under lower jaw; mouth large, upper jaw extends back past hind margin of eye;; tail yellowish with black spots; basibranchial teeth usually present

Cutthroat trout*
Oncorhynchus clarki clarki



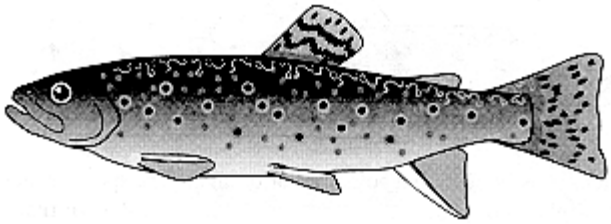
18 (17) No red or orange slash under lower jaw; mouth not large, upper jaw usually does not extend beyong hind margin of eye; tail dusky with dark spots; no basibranchial teeth

Rainbow trout**
Oncorhynchus mykiss

19 (13) Background colour on sides dark with light or coloured spots.

* Two well marked subspecies are native to BC: the coastal cutthroat (*Oncorhynchus clarki clarki*) has the anterior flanks heavily spotted both above and below the lateral line and, usually, a spotted anal fin; and the westslope cutthroat (*Oncorhynchus clarki lewisi*) with the anterior flanks lightly spotted, mainly above the lateral line, and an anal fin that is usually without spots.

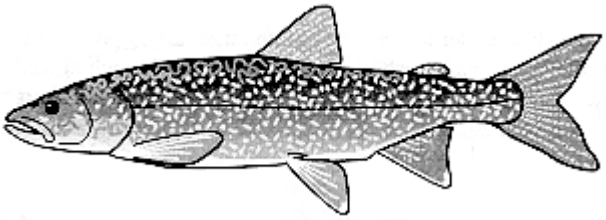
** An exotic subspecies, the golden trout (*Oncorhynchus mykiss aguabonita*) has been introduced into Nicomen Lake, Skagit system.



20 (21) Dorsal fin yellowish, streaked with bold black marbling; back dark, mottled with wormlike vermiculations; red spots on flanks surrounded by blue haloes

Brook trout
Salvelinus fontinalis

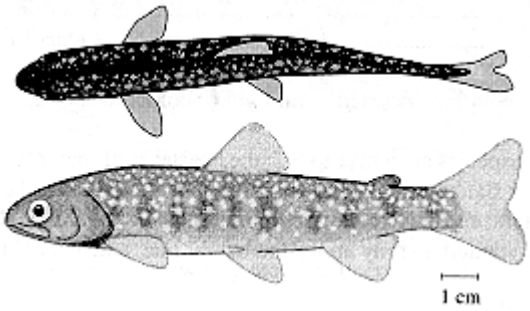
21 (20) Dorsal fin dusky, without bold black marks; spots on flanks without blue haloes



22 (23) Tail deeply forked, light coloured spots on both lobes of tail; head and body covered in light, irregular spots; more than 90 pyloric caeca

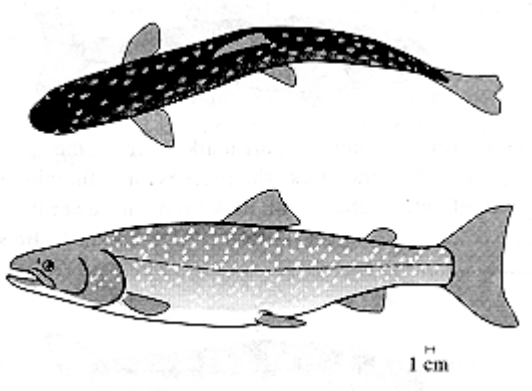
Lake trout
Salvelinus namaycush

23 (22) Tail not deeply forked; spots, if present, only on upper half of tail; fewer than 60 pyloric caeca



24 (25) Viewed from the side, snout is blunt; viewed from above, spots on back are small and crowded together; total branchiostegal count 19-24 (usually 19-22)

Dolly Varden*
Salvelinus malma



28 (27) Viewd from the side, snout is more pointed; viewed from above, spots on back are large and well separated; total branchiostegal count usually 24-29

Bull trout*
Salvelinus confluentus

* Where they coexist, Dolly Varden and bull troat usually show some hybridization.

KEY TO YOUNG SALMON, TROUT AND CHAR (45-100mm)

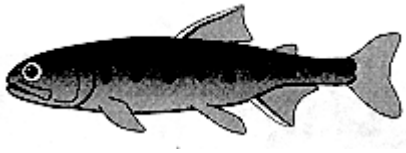
1 (10) Anal fin base longer than dorsal fin base, 13-19 major anal rays in vertical profile the outer margin of the anal fin has a backward slant; no distinct dark spots on dorsal fin

2 (3) Sides silvery; no parr marks; back iridescent greenish-blue; small fish (usually less than 50 mm in fresh water)

Pink salmon
Oncorhynchus gorbuscha

3 (2) Parr marks present

4 (7)



6 (5)Adipose fin with a clear unpigmented "window"; wjite leading edge of anal fin not highlighted behind with dark pigment; more than 100 pyloric caeca

Chinook salmon
Oncorhynchus tshawytscha

7 (4) Parr marks small, oval shaped, none much higher than the vertical diameter of the eye

8 (9) parr marks roughly divided in half by mid line, combined width of parr marks much less than half the combined width of intervening light areas; no greenish iridescence on sides below mid-line; 29-44 gill rakers

Sockeye salmon
(Kokanee)
Oncorhynchus nerka

9 (8) Parr marks faint or absent below mid-line; combined width of parr marks more than half the combined width of the intervening light areas; back mottled green, sides silvery with faint green iridescence below mid-line; 19026 gill rakers

Chum salmon
Oncorhynchus keta

10 (1) Dorsal fin base equal to, or longer than, anal fin base, 8-12 major anal rays

11 (20) Numerous distinct dark spots on dorsal finl in very small specimens only the first dorsal ray may be black

12 (17) Coloured spots (red to yellow) along mid-line or between parr marks; combined width of parr marks along mid-line about equal to or greater than the combined width of intervening light areas

13 (14) Pectoral fins, as long as depressed dorsal fin; caudal fin deeply forked, centre rays about half the length of longest; usually 1-4 spots on operculum

Atlantic salmon
Salmo salar

14 (13) Pectoral fins shorter than depressed dorsal fin; caudal fin not deeply forked, centre rays definately more than half the length of the longest rays

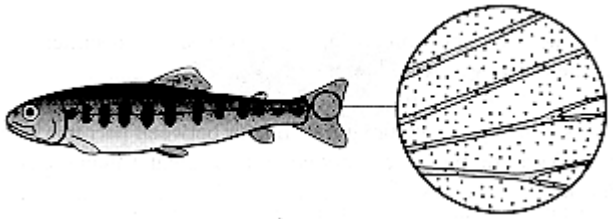
15 (16) About 11 (10-12) parr marks, none as wide as eye diameter; small black scattered spots in addition to parr marks; adipose fin orange; row of pale spots along lateral line

Brown trout
Salmo trutta

16 (15) About 11 (10-12) parr marks, usually 8 or 9, the widest about width of eye; no dark spots other than parr marks; adipose fin plain, not orange; no row of pale spots along lateral line

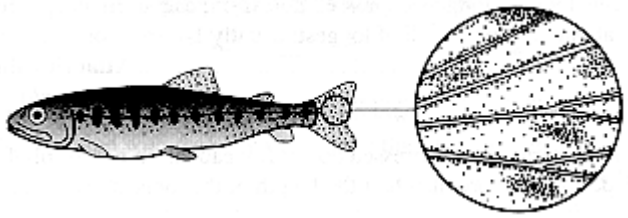
Brook trout
Salvelinus fontinalis

17 (12) No coloured (red or yellow) spots; width of dark areas along mid-line less than width of intervening light areas



18 (19) Few or no spots on tail, on fish less than 50 mm the melanophores are evenly dispersed over the entire tail; hind margin of upper jaw does not reach hind margin of eye; no red or yellow marks under lower jaw

Rainbow trout
Oncorhynchus mykiss



19 (18) Usually black spots on tail, on fish less than 50 mm, melanophores are concentrated between the rays, often forming streaks (precursors of spots); hind margin of upper jaw usually reaches to or past hind margin of eye; often red or yelow marks under lower jaw

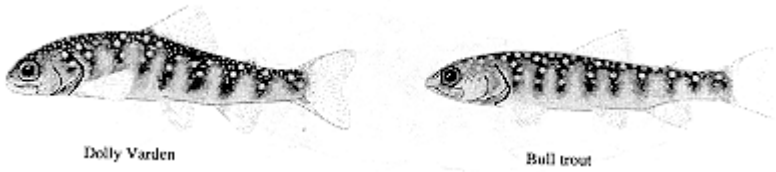
Cutthroat trout*
Oncorhynchus clarki

* Two well marked subspecies in BC: the coastal cutthroat (*Oncorhynchus clarki clarki*) along the coast and inland in the Skeena and northern coastal drainages, and the westslope cutthroat (*Oncorhynchus clarki lewisi*) confined in BC to the Columbia system and a few streams tributary to the Fraser system in the Revelstoke area. Introduced into the Peace system.

20 (11) Dorsal fin without dark spots; first dorsal ray is not black

21 (22) Parr marks along mid-line are vertical bars with width of dark areas equal to or less than width of intervening light areas; dorsal fin starts about middle of body (excluding tail); more than 90 pyloric caeca

Lake trout
Salvelinus namaycush



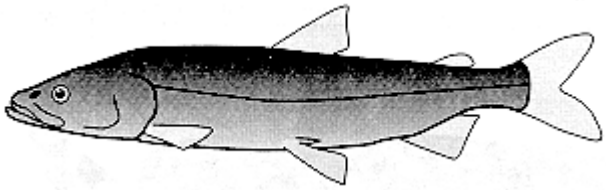
22 (21) Parr marks are irregular blotches; width of dark areas on mid-line greater than width of intervening light areas; dorsal fin starts in front of middle of body (excluding tail); fewer than 50 pyloric caeca

Dolly Varden and **Bull trout****
Salvelinus malma or *Salvelinus confluentus*

** The young of these species can not be reliably identified except biobiochemically.

WHITEFISH
FAMILY SALMONIDAE
SUBFAMILY COREGONINAE

1 (8) With mouth closed, lower jaw projects beyond upper jaw; profile of snout slopes backwards

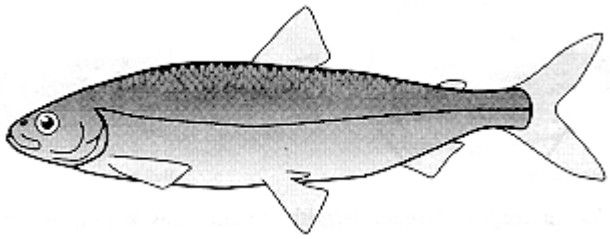


2 (3) Mouth large; viewed from above, snout hardly tapers and is almost as wide at its tip as at the eyes; upper jaw extends back to the posterior margin of the eye

Inconnu
Stenodus leucichthys

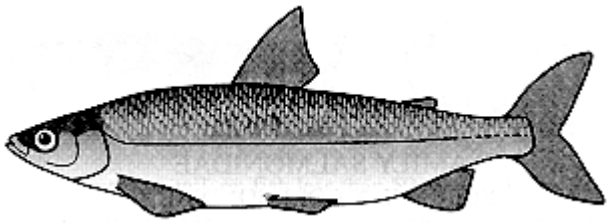
3 (2) Mouth moderate; viewed from above, snout distinctly tapers from tip to eyes; upper jaw does not extend back to the posterior margin of pupil

4 (7) Eye large, its diameter just a little less than interorbital width; pelvic fins often black tipped or dusky



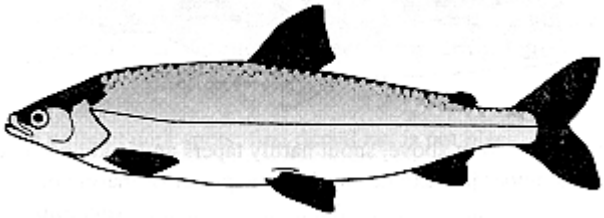
5 (6) Pelvic fins inserted far back, the distance from snout to origin of pelvics equals the distance from origin of the pelvics to a point on the caudal rays posterior to caudal flexure

Lake cisco
Coregonus artedi



6 (5) Pelvic fins inserted forward, the distance from snout to origin of pelvics equals distance from origin of pelvics to a point on the peduncle ahead of caudal flexure

Least cisco
Coregonus sardinella

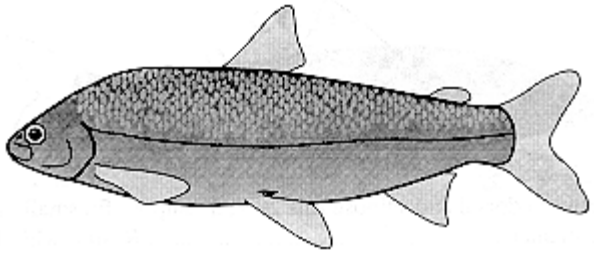


7 (4) Eye small, its diameter almost half the width of the interorbitaal space; pelvic fins rarely tipped with black

Arctic cisco
Coregonus autumnalis

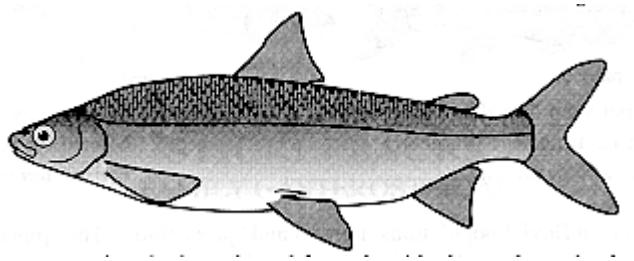
8 (1) with mouth closed, snout clearly over hangs upper jaw

9 (12) Body deep, slab-sided in cross section; juveniles without dark marks along mid-line



10 (11) Snout blunt ("sheep-nosed"), brow rounded when viewed from the side; upper jaw short and broad (its length less than twice its width)

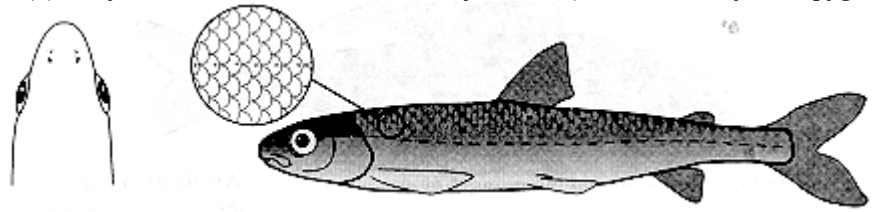
Broad whitefish
Coregonus nasus



11 (10)Snout more pointed when viewed from the side, brow slopes backwards gradually; upper jaw longer (its length more than twice its width)

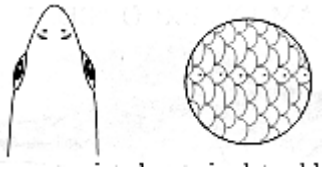
Lake Whitefish
Coregonus clupeaformis

12 (9) Body slender, round in cross section; juveniles (and occasionaly adult pygmy whitefish) with dark marks along mid-line



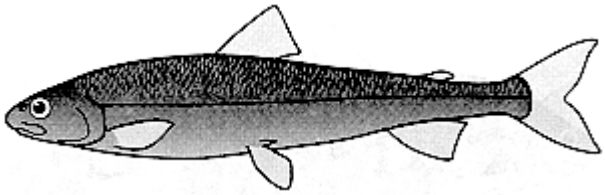
13 (14) Viewed from above, snout blunt, rounded; 52-70 lateral line scales; anterior lateral line scales similar in size to surrounding scales

Pygmy whitefish*
Prosopium coulteri



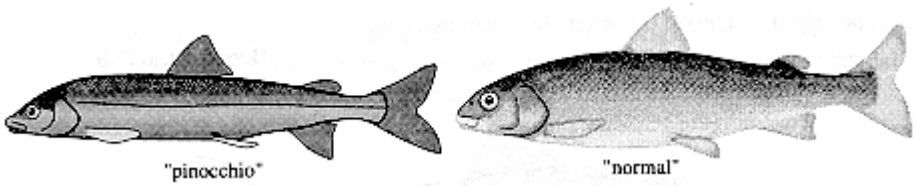
14 (13) Viewed from above, snout pointed; anterior lateral line scales about half the size of surrounding scales

* Hybrids between *P. coulteri* and *P. williamsoni* occur in the Peace River system.



15 (16) Scales between dorsal and adipose fins 29-35; adipose fnes small, its base about equal to eye diameter

Round whitefish
Prosopium cylindraceum

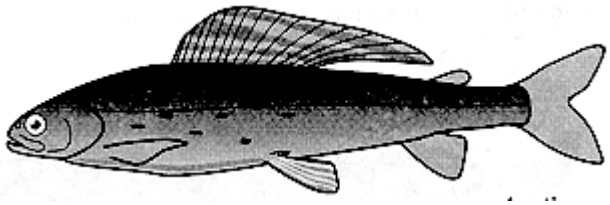


16 (15) Scales between dorsal and adipose fins, 19-26; adipose fin large, its base usually more than 1,5 times eye diameter

Moutain whitefish*
Prosopium williamsoni

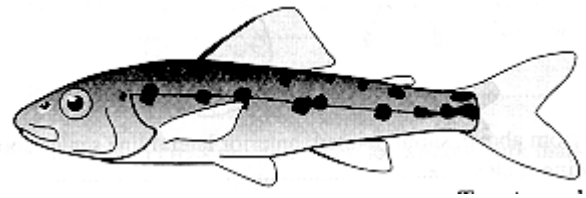
* Two body forms in Fluvial populations; normal and "pinocchio". The "pinocchio" form has a longer snout and thinner body than the normal form.

GRAYLINGS
FAMILY SALMONIDAE
SUBFAMILY THYMALLINAE



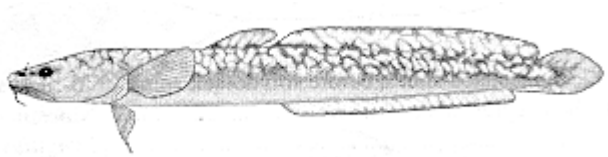
Arctic grayling
Thymallus arcticus

TROUT-PERCHES
FAMILY PERCOPSIDAE



Trout-perch
Percopsis omiscomaycus

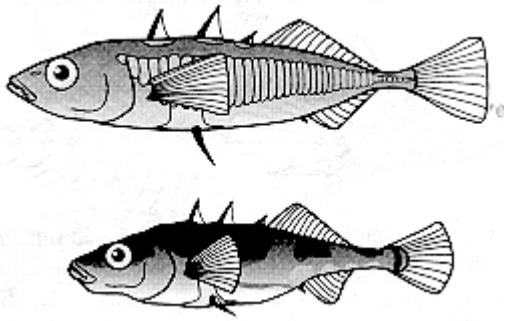
CODS
FAMILY GADIDAE



Burbot
Lota lota

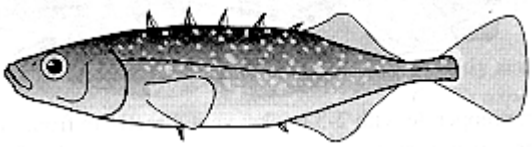
STICKLEBACKS
FAMILY GASTEROSTEIDAE

1 (4) Two to six isolated spines before soft dorsal; spines fold straight back when depressed



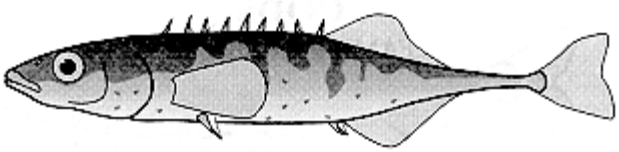
2 (3) Two to four (usually 3) dorsal spines; gill membrane attached to isthmus

Threespine stickleback
Gasterosteus aculeatus



3 (2) five to six dorsal spines; gill membrane free from isthmus

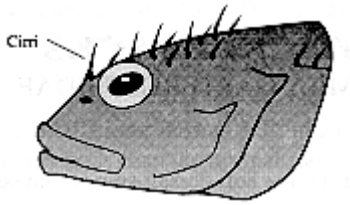
Brook stickleback
Culaea inconstans



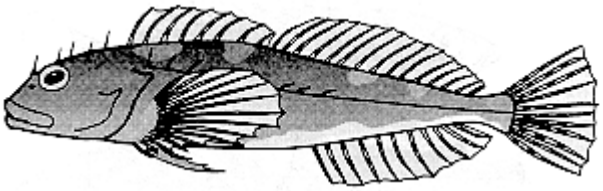
4 (1) Seven to eleven isolated spines before soft dorsal; spines fold alternately to the left and right when depressed

Ninespine stickleback
Pungitius pungitius

SCULPINS
FAMILY COTTIDAE

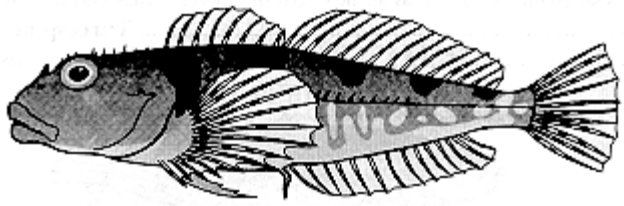


1 (4) Prominent cirri on head and lateral line



2 (3) Spine on preopercle simple; vent advanced from anal fin; a marine species recorded from fresh water above tidal influence in some Queen Charlotte Island

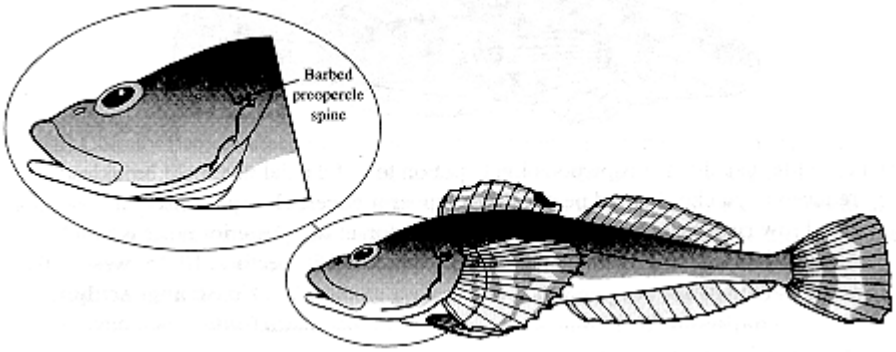
Sharpnose sculpin
Clinocottus acuticeps



3 (2) Spine on preopercle with 2-3 hooks; vent directly in front of anal fin; a marine species that occurs regularly in estuaries, and is recorded from fresh water above tidal influence in some Queesn Charlotte Island streams

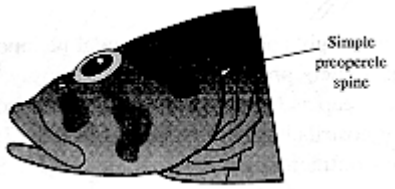
Tidepool sculpin
Oligocottus maculosus

4 (1) No cirri on head or lateral line

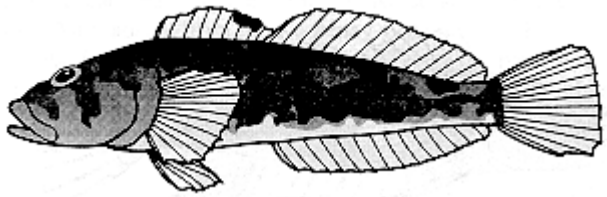


5 (6) Spine on preopercle with 3 or 4 hooks; belly dead white; pectoral fins with alternating yellow and dark bands of approximately equal width; common in estuaries along the entire coast; rare in fresh water above tidal influence

Pacific staghorn sculpin
Leptocottus armatus



6 (5) Preopercular spine simple; belly dusky or light but not dead white, pectoral fins speckled but without broad dark bands

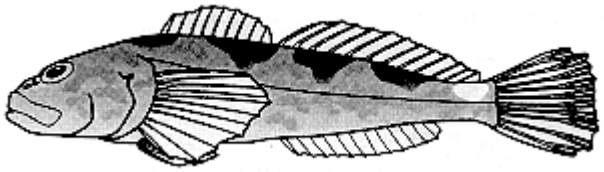


7 (8) anal fin base distinctly longer than head, 15-19 anal rays; first dorsal fin with a conspicuous black spot; single pore on mid-line of chin; back and sides with strong prickling (prickles absent in some coastal lake populations); dorsal VII-X (XI), 19-23; pectorals rays 15-18; lateral line pores 32-43

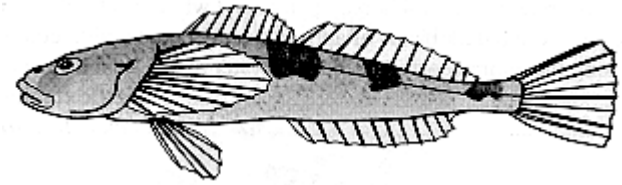
Prickly sculpin
Cottus asper

8 (7) anal fin base about equal to, or less than, head length

9 (12) Single pore on mid-line of chin; lateral line complete



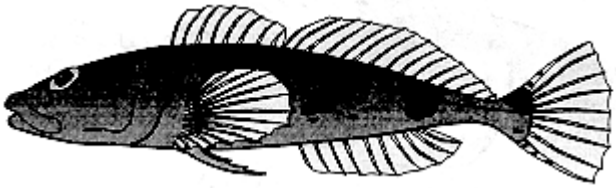
10 (11) In life, usually a conspicuous light spot on top of caudal peduncle; prickles reduced to patches behind pectoral fins; upper preopercular spine straight; head not flat, brow rises from back of eye to origin of dorsal fin; poterior nostrils tubular; dorsal VIII-X, (16) 17-20; anal 12-14 (rarely 15 or 16); pectoral 13-15; west of the Continental Divide.



11 (10) In life, no conspicuous light spot on top of caudal peduncle; upper back and sides with prickles; prominent preopercular spine, strongly hooked; head wide and flattened (about half as deep as long), brow hardly rising from back of eye to origin of dorsal fin; posterior nostrils normal; dorsal VII-X, 16-17; anal 12-13; pectoral fins 14-16; east of the Continental Divide

Spoonhead sculpin
Cottus ricei

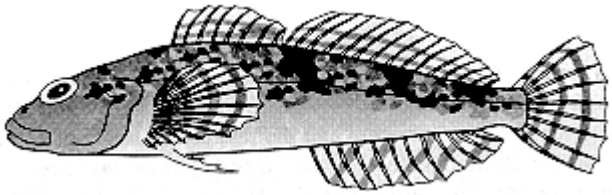
12 (9) Two pores on mid-line of chin; lateral line development variable



13 (14) Head large (less than 3 in standard length); caudal peduncle narrow (less than interorbital width); usually heavily prickled on back and sides (except in populations isolated above barriers); lateral line complete; palatine teeth present (long toot patch); dorsal VII-IX, 15-17; anal 11-13; pectoral 15-17; lateral line pores 29-35

Torrent sculpin
Cottus rhotheus

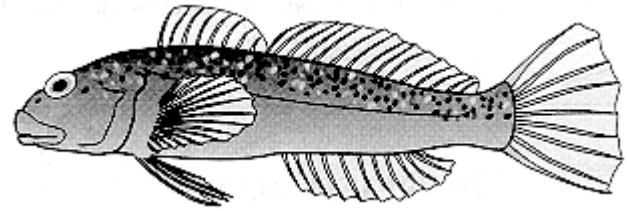
14 (13) Head smaller (more than 3 into standard length); caudal peduncle deeper (greater than interorbital width); prickles, if present reduced to a patch behind pectoral fin



15 (16) Chunky fish, caudal peduncle relatively narrow (more than 3 into body width measured from below and immediately in front of the pectoral fins; lateral line usually complete, extending to base of caudal fin; palatine teeth present; pectoral rays 14-16; common below barriers in the Similkameen system; in the Kettle River below Cascade Falls; in the Columbia River and tributaries below Keenlyside Dam; absent from the Kootenay system above Bonnington Falls and the Okanagan systems above Okanagan Falls.

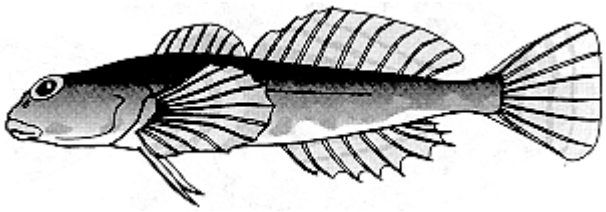
Mottled sculpin
Cottus bairdi (*hubbsi* type)*

16 (15) Slim fish, caudal peduncle relatively wide (less than 3 into body width measured from below and immediately in front of the pectoral fins; lateral line incomplete, ending well before base of caudal fin



17 (18) Palatine teeth present (sometimes weakly developed); pectoral rays 12-15; anal rays (10) 11-14 (many individuals with more than 12 rays); in BC, in the Kettle River below Cascade Falls; in the Columbia River and tributaries below Keenleyside Dam; absent from the Kootenay system above Bonninton Falls; and absent from the Similkameen and Okanagan systems but present in the lower tributaries to the Flathead River

Shorthead sculpin**
Cottus confusus



18 (17) Palatine teeth absent, pectoral rays 12-15; anal rays 10-13 (most individuals with 12 or less rays); common throughout the upper Columbia, Pend d"Oreille and Kootenay systems, but absent below barriers in the Castlegar-Trail area; absent from the Similkameen system but present in the Okanagan system above Okanagan Falls.

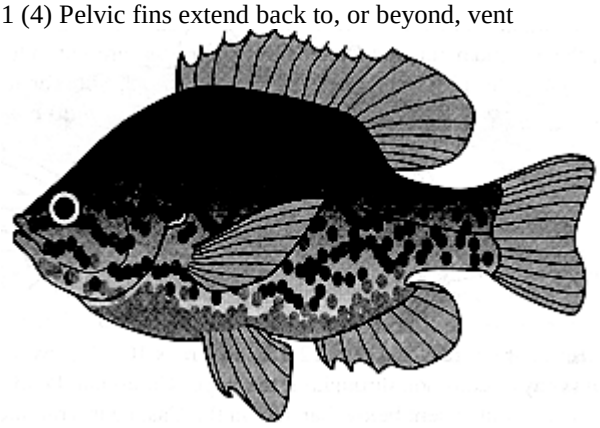
Slimy sculpin
Cottus cognatus

* The Columbia form of *C. bairdi* was originally described as a separate species. *Cottus hubbsi*, but was later synonmymized with *C. bairdi* by Bailey and bond (1963). No reasons were given for the synonymy and the taxonomic status of *C. hubbsi* warrants re-investigation. In BC, although both *C. bairdi* and *C. cognatus* occur in the Castlegar-trail area, apparently they never coexist. This suggests the possibility of a competitive interaction between the species.

** The shorthead sculpin, Cottus confusus, occurs in low gradient tributaries of the Columbia and Kootenay rivers in the Castlegar-Trail area. Here, it commonly coexists, and apparently hybridizes, with C. bairdi. This makes specific identification in this area difficult. In the Flathead system, C. confusus coexists with C. cognatus, although the area of overlap is relatively narrow (Peden and Hughes). Recently, Peden (pers. comm.) conducted an allozyme survey of C. confusus, and other sculpins, in the Flathead, Columbia, and Kootenay systems. His results suggest that the fish in the Flathead River that were previously identified as C. confusus (McAllister and Lindsey 1961; Hughes and Peden 1984) are not the same species as the fish identified as C. confusus in the Columbia and Kettle rivers (Peden et al 1989). This matter is still unresolved and, in BC, the only thing certain about Cottus confusus is that it is aptly named!

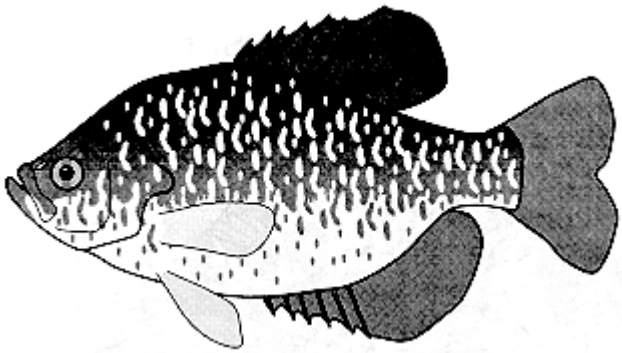
SUNFISH BASS
FAMILY CENTRAQRCHIDAE

1 (4) Pelvic fins extend back to, or beyond, vent



2 (3)anal fin noticeably smaller than dorsal fin; distinct black opercular flap; 3 spines in anal fin

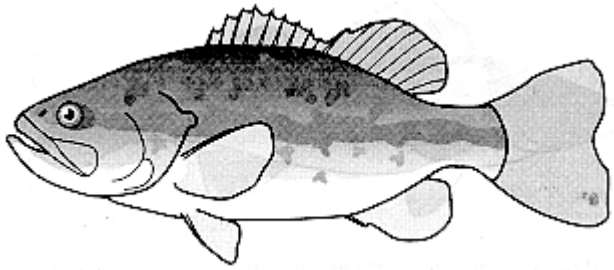
Pumpkinseed
Lepomis gibbosus



3 (2) no distinct black opercular flap; dorsal and anal fin about equal in length; 6-7 spines in anal fin

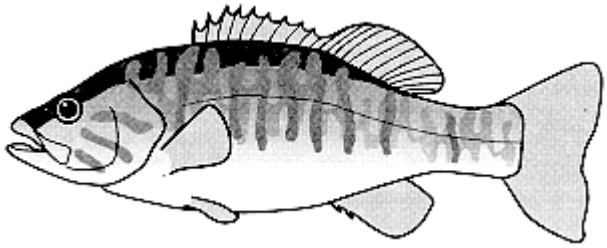
Black crappie
Pomoxis nigromaculatus

4 (1) Pelvic fins do not reach vent, they extend back to about half the distance to vent



5 (6) Upper jaw reaches to beyond hind margin of eye; eye brown; 60-68 scales in lateral line; young with black band continuous across snout and gill cover but broken along sides

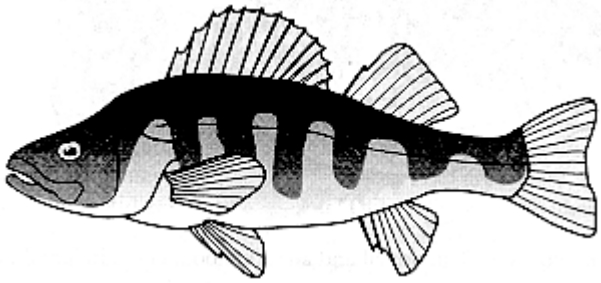
Largemouth bass
Micropterus salmoides



6 (5) Upper jaw reaches back to about mid-eye; eye red to orange; 68-78 scales in lateral line; young with dark, radiating bands on cheeks

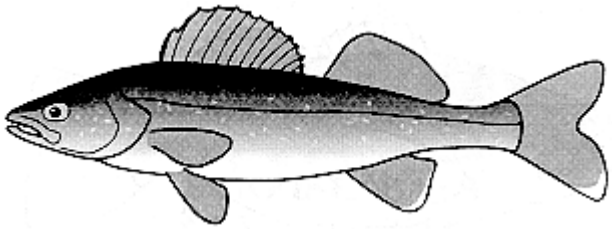
Smallmouth bass
Micropterus dolomieui

PERCHES
FAMILY PERCIDAE



1 (2) Sides in adults with 6 to 9 dark vertical bars; lower lobe of tail fin without a conspicuous white mark; jaws without prominent canine teeth; 6-8 soft anal rays

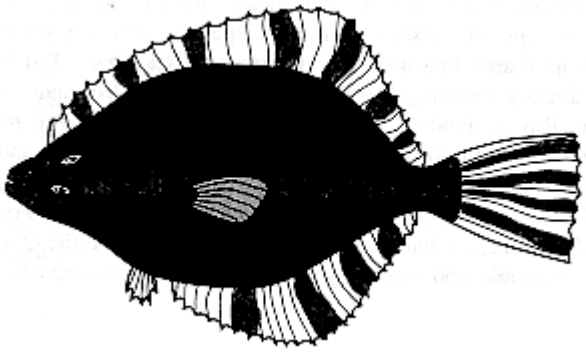
Yellow perch
Perca flavescens



2 (1) Sides in adults without dark vertical bars (irregular bars sometimes present in juveniles); lower lobe of tail fin with a conspicuous white mark; jaws with prominent canine teeth; 12-13 soft anal rays

Walleye
Stizosteion vitreum

FLOUNDERS
FAMILY PLEURONECTIDAE



Starry flounder
Platischthys stellatus

Over the years, our knowledge of BC freshwater fish has grown through the efforts of many people. There is not space to list all the private citizens who have contributed specimens and information; however, their assistance and interest is gratefully acknowledged. In its various incarnations the Ministry of Environment, Lands and Parks has supported research on native species. Ministry personnel who have been especially helpful are Chris Bull, John Cartwright, R.K. Dahl, Ted Down, Jay Hammond, A1 Martin, Juanita Ptolemy, George Reid and Marvin Rosenau. Gordon Ennis, Dave Peacock and Ray Sjolund (Dept. of Fisheries and Oceans) also helped in many ways. Cas Lindsey and Tom Northcote started it all; Grant Hughes and Alex Peden of the Royal British Columbia Museum generously shared their knowledge, and Sid Cannings of the BC Conservation Data Centre goaded us into putting it onto paper. Tom Riemchen and Peter Mylechreest provided much of the information on the Queen Charlotte Islands. To all of these people, and especially to those whose names we've forgotten, many thanks.

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