KEYS TO THE FRESHWATER FISHES OF THE RED RIVER OF THE NORTH DRAINAGE AND MANITOBA, WITH SOME SPECIES ADDED FROM ADJACENT AREAS OF THE RAINY, ENGLISH AND WABIGOON RIVER DRAINAGES

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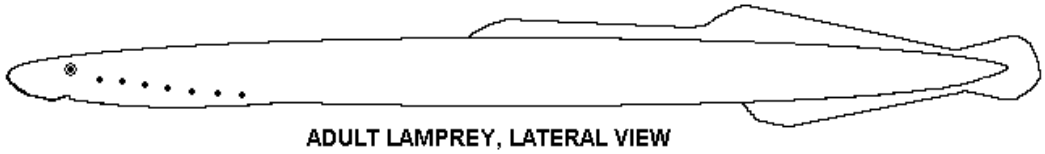
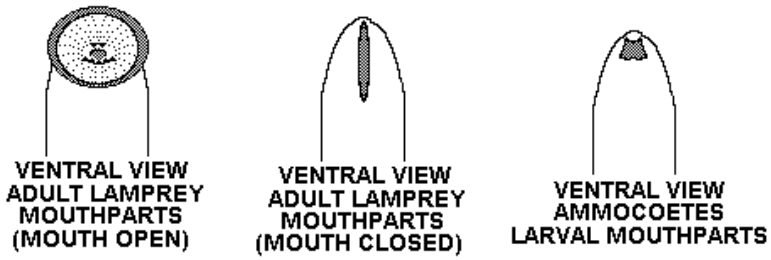
KEY TO THE FAMILIES

1a
Jaws and paired fins lacking. In adults, mouth circular, funnel shaped when open, armed with spiral rows of horny teeth. Mouth closes to a longitudinal slit. In ammocoetes larvae, mouth toothless, surrounded by an oral hood. Seven pairs of external gill openings.



ADULT LAMPREY, LATERAL VIEW



Lampreys, family **Petromyzontidae Page 5**

1b
Jaws and paired fins present. Jaws with true teeth or toothless, not horny teeth. Mouth closes to a transverse slit. One pair of external gill openings.

go to choice **2**

2a (1b)
Caudal fin heterocercal, with body extending into upper lobe, which is longer than lower lobe. Mouth ventral, overhung by long snout, with four barbels anterior to mouth.

Sturgeons, family **Acipenseridae**
1 species, **lake sturgeon**, ***Acipenser fulvescens***

2b
Caudal fin homocercal, body not extending into upper lobe, and fin symmetrical, or nearly so. Mouth superior, terminal, or inferior, not ventral and overhung by snout. Barbels may be present, but never anterior to mouth.

go to choice **3**

3a (2b)
Jaws elongated into beak, with strong teeth. Body covered by rhombic, ganoid scales.

Gars, family, **Lepisosteidae**
1 species, **longnose gar**, ***Lepisosteus osseus***
RED RIVER, U.S.A. ONLY, NO RECENT RECORDS

3b
Jaws not elongated into beak. Scales cycloid, ctenoid or absent.

go to choice **4**

4a (3b)
Pectoral fins low on sides, pelvic fins far back on abdomen. Posterior tips of depressed pectoral fins not reaching base of pelvic fins.

go to choice **5**

4b
Pectoral fins higher on sides, pelvic fins farther forward. Posterior tips of depressed pectorals reach at least to base of pelvic fins.

go to choice **15**

5a (4a)
Adipose fin present.

go to choice **6**

5b
Adipose fin absent.

go to choice **8**

6a (5a)
Scales absent, mouth surrounded by 8 barbels.

Catfish, family **Ictaluridae page 14**

6b
Scales present (but may be small and imbedded), barbels absent.

go to choice **7**

7a (6b)
Pelvic axillary process present.

Trout and Whitefish, family **Salmonidae page 15**

7b
Pelvic axillary process absent.

Smelts, family **Osmeridae page 18**

8a (5b)
Teeth present (may be small).

go to choice **9**

8b
Teeth absent.

go to choice **13**

9a (8a)
Teeth on maxillae and tongue. Anal fin with 26 or more rays, its base longer than the head. Body deep and strongly compressed.

Mooneyes, family **Hiodontidae page 5**

9b
Teeth on maxillae but not tongue or absent from both maxillae and tongue.

go to choice **10**

10a (9b)
Teeth on maxillae. Dorsal fin long and low, starting anterior to pelvic fins and extending nearly to base of caudal fin. A broad, flat bony plate covers underside of head between the sides of the lower jaw.

Bowfin, family **Amiidae**
1 species, **bowfin**, ***Amia calva***
RED RIVER HEADWATERS IN MN, AND
INTRODUCED INTO LAKE OF THE WOODS IN 1984

10b
No teeth on maxillae or tongue. Dorsal fin shorter and starting over or behind pelvic fins. No bony plate on underside of head between lower jaws.

go to choice **11**

11a (10b)
Head long, the snout depressed and pointed. Strong fang-like teeth on lower jaw, premaxillae and roof of mouth.

Pikes, family **Esocidae**, **page 15**

11b
Head shorter , the snout not depressed. Teeth small, and may be difficult to see without magnification.

go to choice **12**

12a (11b)
Mouth reaching to below eye. Premaxillae immovably joined to snout.

Mudminnows, family **Umbridae**
1 species, **central mudminnow**, ***Umbra limi***

12b
Mouth not reaching to below eye. Premaxillae moveably joined to snout.

Topminnows, family **Fundulidae**
1 species, **banded killifish**, ***Fundulus diaphanus***

13a (8b)
Lips with fleshy expansions. Mouth inferior.

Suckers, family **Catostomidae** page **12**
(see also choice **14a**)

13b
Lips without fleshy expansions. Mouth usually terminal, but may be subterminal or inferior

go to choice **14**

14a (12b)
Anal fin set far back, the distance between anal origin and middle of caudal base equal to 1/2 or less the distance from anal origin to posterior margin of operculum.

Suckers, family **Catostomidae page 12**

14b
Anal fin set farther forward, the distance from anal origin to middle of caudal base equal to more than 1/2 the distance from anal origin to posterior margin of operculum.

Minnows, family **Cyprinidae page 6**

15a (4b)
Fins without spines, or spines, if present, flexible and weak, not strong, rigid and sharp.

go to choice **16**

15b
Strong, rigid, sharp spines present in some or all of anterior dorsal, anal and pelvic fins.

go to choice **18**

16a (14a)
Body eel-like, fins lacking spines and scales tiny, imbedded and not obvious without close inspection. A single barbel at tip of chin.

Codfishes, family **Gadidae**
1 species, **burbot**, ***Lota lota***

16b
Body deeper, not eellike. One or more weak spines present at least in dorsal fin. Scales may be ctenoid and larger, modified into prickles or absent

go to choice **17**

17a (16b)
Adipose fin present, scales ctenoid, normally developed. One dorsal fin with 1 or 2 weak spines at leading edge. One weak spine at leading edge of anal fin.

Troutperch, family **Percopsidae**
1 species, **troutperch**, ***Percopsis omiscomaycus***

17b
Adipose fin absent. Scales absent or modified into prickles. Two dorsal fins, the anterior one composed of weak spines. A weak spine present at the leading edge of each pelvic fin.

Sculpins, family **Cottidae** **page 18**

18a (15b)
Anterior dorsal fin composed of free spines, not joined by a fin membrane. Pelvic fins reduced to a single free spine each. Scales absent or modified into a series of enlarged lateral plates.

Sticklebacks, family **Gasterosteidae** **page 18**

18b
Spines in anterior dorsal fin connected by a fin membrane. Pelvic fins with a spine at leading edge connected to five branched rays by a fin membrane. Scales always ctenoid and normally developed.

go to choice **19**

19a (18b)
Anal fin with two or fewer spines.

go to choice **20**

19b
Anal fin with three or more spines

go to choice **21**

20a (19a)
Posterior dorsal fin base longer than head, with one spine and 25 or more rays. Second anal spine thickened and much longer than first. Lateral line extending to the rear margin of the caudal fin.

Croakers, family **Sciaenidae**
1 species, **freshwater drum**, ***Aplodinotus grunniens***

20b
Posterior dorsal fin base shorter than head, with one spine and 22 or fewer rays. Second anal spine slender and not much longer than first, or absent. Lateral line extending onto the base of the caudal fin only in the walleye and sauger.

Perch, family **Percidae** **page 21**

21a (19b)
Posterior dorsal and anal fins falcate. Anterior and posterior dorsal fins separate. Posterior margin of opercular bone with a spine. A series of 6-8 narrow, longitudinal dark stripes on sides.

Temperate Basses, family **Moronidae**
1 species, **white bass**, ***Morone chrysops***
INTRODUCED

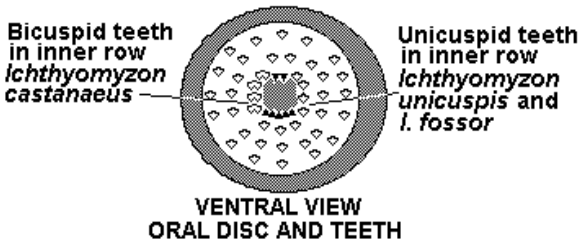
21b
Posterior dorsal and anal fins with convex, rounded margins. Anterior and posterior dorsal fins connected at least by a narrow fin membrane, and usually broadly connected. Posterior margin of opercular bone without a spine. Markings various, including sometimes, a single mid-lateral dark band, but never 6-8 narrow longitudinal stripes.

Sunfishes, family **Centrarchidae** **page 20**

KEY TO THE ADULT LAMPREYS (Family Petromyzontidae)

1a
At least 1 inner lateral tooth on one side of mouth opening at centre of buccal funnel with 2 cusps. Usually 2 or more teeth on each side with 2 cusps.

chestnut lamprey, ***Ichthyomyzon castanaeus***



1b
All lateral teeth unicuspid.

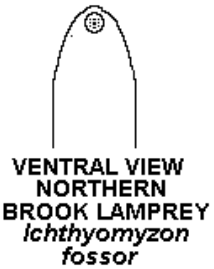
go to choice **2**

2a (1b)
Oral disc wider than the branchial region of the body, armed with strong, sharp teeth. Infraoral lamina with 5-11 sharp cusps. Lateral line pores each marked by a dark pigment spot.

silver lamprey, ***Ichthyomyzon unicuspis***

2b
Oral disc narrower than branchial region. Teeth few and weakly developed. Infraoral lamina with 6-11 blunt, knoblike cusps. No pigmentation around lateral line pores.

northern brook lamprey, ***Ichthyomyzon fossor***



NOTE: Ammocoetes larvae of lampreys have a toothless oral hood surrounding the mouth opening instead of a buccal funnel armed with teeth. There are no morphological characters by which the ammocoetes larvae of Manitoba's lamprey species can be identified.

KEY TO THE MOONEYES (Family Hiodontidae)

1a
Origin of the dorsal fin anterior to the origin of the anal fin. Belly between pectoral and pelvic fins rounded across midline, and covered by scales.

mooneye, ***Hiodon tergisus***

1b
Origin of dorsal fin posterior to the origin of the anal fin. Belly between pectoral and pelvic fins is keeled, and scales are not continuous across the midline.

goldeye, ***Hiodon alosoides***

KEY TO THE MINNOWS (Family Cyprinidae)

1a
Dorsal fin long, with more than 11 soft rays and a spine at its leading edge. A spine also present at leading edge of anal fin.

go to choice **2**

1b
Dorsal fin short, with fewer than 11 soft rays and no spine at leading edge of either dorsal or anal fin.

go to choice **3**

2a (1a)
Upper jaw with two barbels on each side. Pharyngeal teeth broad, flat-crowned and molar-like, in 3 rows.

carp, ***Cyprinus carpio***
INTRODUCED

2b
No barbels on upper jaw. Pharyngeal teeth slender, with rounded crowns, in 1 row.

goldfish, ***Carassius auratus***
INTRODUCED

3a (1b)
Lower jaw with a cartilaginous cutting edge. Intestine long, and looped in a spiral pattern over the ventral surface of the swim bladder.

go to choice **4**

3b
Lower jaw without a cartilaginous ridge. Intestine may be long and have extra loops, but not in a spiral pattern over the lower surface of the swim bladder.

go to choice **5**

4a (3a)
Usually 39 – 46 scale rows around the body just in front of the dorsal fin. Usually 49 –55 lateral line scales.

central stoneroller, ***Campostoma anomalum***
OTTER TAIL RIVER (RED RIVER DRAINAGE) U.S.A.

4b
Usually 31 – 36 scale rows around the body just in front of the dorsal fin. Usually 43 – 47 lateral line scales

largescale stoneroller, Campostoma oligolepis
FOREST RIVER (RED RIVER DRAINAGE) U.S.A.

5a (3b)
A slender barbel present at the posterior tip of the upper jaw.

go to choice **6**

5b
Barbel either absent or forward of posterior tip of upper jaw and often tiny and difficult to see.

go to choice **12**

6a (5a)
Groove separating upper lip from snout is interrupted across midline of snout.

genus ***Rhinichthys***
go to choice 7

6b
Groove separating upper lip from snout is continuous across midline.

go to choice **8**

7a (6a)
Snout projects beyond tip of lower jaw by a distance equal to or greater than that from tip of lower jaw to angle of mouth.

longnose dace, ***Rhinichthys cataractae***

7b
Snout projects beyond tip of lower jaw by less than the length from tip of lower jaw to angle of mouth.

blacknose dace, ***Rhinichthys atratulus***

8a (6b)
Well developed dark lateral band which extends onto the head is present and visible even on faded preserved specimens. NOTE: In Lake Chub, *Couesius plumbeus* over about 6 cm total length, the lateral band becomes weak and is lost in large specimens. They are also keyed out under the alternate choice.

go to choice **9**

8b
Lateral band absent, or if present, weakly developed and not extending onto the head.

go to choice **10**

9a (7a)
48 or fewer lateral line scales. Lateral band strong, extending onto head and across snout. Posterior end of lateral band ends in a distinct black spot at base of tail. Dorsal and caudal fins orange or red in living specimens.

hornyhead chub, ***Nocomis biguttatus***

9b
55 or more, usually 59 or more lateral line scales. Lateral band is less well defined. If it extends onto snout, then the snout portion is offset lower than the portion behind the eye. No black spot at caudal base. Lateral band indistinct to absent on specimens over 6 cm TL. Dorsal and caudal fins dusky, not orange or red in life.

lake chub, ***Couesius plumbeus***
(see also choice **11b**)

10a (8b)
Posterior margins of pectoral fins straight (in smaller specimens) to distinctly concave (falcate) in larger specimens. Head is notably flattened, with a pointed snout, when viewed from the side.

flathead chub, ***Platygobio gracilis***

10b
Posterior margins of pectoral fins convex. Head not flattened and snout blunt in lateral view.

go to choice **11**

11a (9b)
41 or fewer lateral line scales. In specimens over about 7cm, there is a distinct white stripe along the lower edge of the caudal fin. this stripe is also visible in smaller specimens if magnification is used.

silver chub, ***Macrhybopsis storeriana***

11b
55 or more, usually 59 or more lateral line scales. Lower margin of caudal fin is dusky.

lake chub, ***Couesius plumbeus***
(see also choice **9b**)

12a (5b)
55 or more lateral line scales (or scale rows in lateral series, if lateral line not complete).

go to choice **13**

12b
54 or fewer lateral line scales (or lateral scale rows, if lateral line not complete).

go to choice **16**

13a (12a)
Lateral line runs full length of body, although it may be interrupted in places. A barbel is usually present, on the upper edge of the maxilla, just ahead of its posterior tip, concealed in the groove between the snout and upper lip, and often
tiny and difficult to see.

go to choice **14**

13b
Lateral line ends over or anterior to pelvic fins. Barbel never present.

genus ***Phoxinus***
go to choice **15**

14a (13a)
63 or fewer lateral line scales. Mouth extending to below anterior edge of pupil of eye. A black spot at base of tail.

creek chub, ***Semotilus atromaculatus***

14b
71 or more lateral line scales. Mouth extending to below or slightly in front of anterior margin of eye. No black spot at base of tail, although a prominent dark lateral band is present.

pearl dace, ***Margariscus margarita***

15a (13b)
Intestine short, with a single loop running forward along right side of stomach. Mouth reaching to below anterior margin of eye.

finescale dace, ***Phoxinus neogaeus***

15b
Intestine longer, with two loops crossing from side to side overlying the stomach. Rear corner of mouth does not reach back as far as anterior margin of eye.

northern redbelly dace, ***Phoxinus eos***

16a (12b)
First dorsal ray blunt tipped and separated from second by at least a narrow membrane. (This is more easily seen in large than small specimens.) Predorsal scales distinctly smaller and more crowded than lateral body scales, margin of dorsal fin always rounded.

genus ***Pimephales***
go to choice **17**

16b
First dorsal ray slender, pointed, tapered and closely bound to second. Predorsal scales as large, or nearly so, as other scales on upper body. Margin of dorsal fin straight or falcate in all Manitoba species EXCEPT *Cyprinella spiloptera*.

go to choice **19**

17a (16a)
Lateral line not extending full length of body, usually ending in advance of anal fin. Mouth is terminal except in breeding males, in which it is somewhat overhung by the enlarged snout with breeding tubercles.

fathead minnow, ***Pimephales promelas***

17b
Lateral line extends full length of the body. Mouth subterminal to inferior in both sexes at all stages.

go to choice **18**

18a (17b)
Mouth distinctly overhung by snout, and snout length is less than eye diameter. Lateral band distinct, extending on head, through eye and across snout. Lateral band terminating posteriorly in a basicaudal spot. Dorsal fin without a dark blotch in its lower anterior corner. Peritoneum black, and main loop of intestine crossing body cavity anteriorly and extending rearward to left of stomach.

bluntnose minnow, ***Pimephales notatus***

18b

Mouth nearly terminal, slightly overhung by snout and snout length equal to or greater than eye diameter. Lateral band less distinct, not extending onto head, and no basicaudal spot. Dorsal fin with a dark blotch on its lower anterior corner (may be difficult to see on small or badly faded preserved specimens). Peritoneum silvery and main loop of intestine not crossing body cavity anteriorly and extending posteriorly to left of stomach.

bullhead minnow, ***Pimephales vigilax***

SHEYENNE RIVER (RED RIVER DRAINAGE) U.S.A.

19a (16b)

Abdomen with a fleshy midventral keel extending from pelvic fins to anus. Lateral line strongly decurved, its lowest point more than 2/3 the distance from top of back to lower edge of belly.

golden shiner, ***Notemigonus chrysoleucas***

19b

No fleshy keel on abdomen. Lateral line may curve downward, but never much further than half way between back and belly.

go to choice **20**

20a (19b)

Intestine very long, with two loops coiled into a spiral overlying the stomach.

brassy minnow, ***Hybognathus hankinsoni***

20b

Intestine short, with only main loop, not coiled into a spiral.

go to choice **21**

21a (20b))

Anal rays 9 or more. NOTE: *Luxilus cornutus*, *Cyprinella spiloptera* and *Notropis volucellus* may also have 8, or rarely 7, anal rays. They are also keyed out under the alternate choice.

go to choice **22**

21b

Anal rays 8 or fewer.

go to choice **26**

22a (21a)

Origin of dorsal fin over or anterior to base of pelvic fins.

go to choice **23**

22b

Origin of dorsal fin posterior to base of pelvic fins.

go to choice **25**

23a (22a)

Lateral scales anterior to dorsal fin are more than twice as high as long. Anal rays usually 9, sometimes 8 or 10.

common shiner, ***Luxilus cornutus***

(see also choice **34a**)

23b

Lateral scales anterior to dorsal fin less than twice as high as long. Anal rays usually 8, rarely 7 or 9.

go to choice **24**

24a (23b)

Mid-dorsal stripe well developed, continuous around base of dorsal fin. Dorsal fin with dark pigment on membranes between last three rays, forming a distinct spot in specimens over about 3.5cm TL. Body deep and compressed, with flat sides. Back and belly profiles about equally arched. Posterior margin of anal fin sloping to rear and upward. Pharyngeal teeth usually 1,4-4,0 but may be 1,4-4,1; 0,4-4,1 or rarely 0,4-4,0.

spotfin shiner, ***Cyprinella spiloptera***

(see also choice **35a**)

24b

Mid-dorsal stripe indistinct except for some pigment along base of dorsal fin. No dark pigment on membranes between dorsal fin rays. Body slender, little compressed, and back more arched than belly. Posterior margin of anal fin vertical or sloping forward of vertical. Pharyngeal teeth always 0,4-4,0.

mimic shiner, ***Notropis volucellus***
(see also choice **30a**)

25a (22b)
Snout long and narrowly pointed, its length nearly equal to eye diameter. Dark lateral band broad and distinct posterior to dorsal fin, and becoming more narrow and indistinct anterior to dorsal fin. Scales on back and upper sides finely outlined with black pigment.

rosyface shiner, ***Notropis rubellus***

25b
Snout shorter and more blunt, its length only between 1/2 and 3/4 the eye diameter. Lateral band less distinct, and may be completely masked by silver pigment, especially in fresh specimens. Scales on back and upper sides not outlined with black pigment.

emerald shiner, ***Notropis atherinoides***

26a (21b)
Dark lateral band distinct over entire length of body and on head.

go to choice **27**

26b

Dark lateral band absent or becoming indistinct anterior to dorsal fin, and never extending onto head.

go to choice **30**

27a (26a)
EITHER chin lacks dark pigment, OR, if there is any dark pigment on the chin, then the upper lip projects at least slightly beyond the tip of the lower jaw (lower jaw included).

go to choice **28**

27b
Chin always has black pigment. Upper and lower jaws equal, lower jaw never included.

go to choice **29**

28a (27a)
Chin lacks black pigment, lower jaw not included. Posterior tip of upper jaw reaching only to below nostril. Pharyngeal teeth always 0,4-4,0. Middorsal stripe indistinct or absent, and lateral stripe continuous across iris of eye.

blacknose shiner, ***Notropis heterolepis***

28b

Some black pigment usually present on chin, and lateral stripe with a distince spot at its posterior end. Lower jaw included. Posterior tip of upper jaw reaching to, or nearly to a point below anterior margin of eye. Pharyngeal teeth in two rows, at least on one side, the count usually 2,4-4,2. Middorsal band distinct anterior to dorsal fin, and lateral band not continuous across iris of eye.

weed shiner, ***Notropis texanus***

29a (27b)
Posterior tip of upper jaw reaching only to below nostril. Mouth strongly oblique.

pugnose shiner, ***Notropis anogenus***
OTTERTAIL AND SHEYENNE RIVERS, U.S.A.

29b
Posterior tip of upper jaw reaching to below anterior margin of eye, or nearly so. Mouth moderately oblique. Lateral band without a spot or with only a small spot at its posterior end. Pharyngeal teeth 1,4-4,1

blackchin shiner, ***Notropis heterodon***

30a (26b)
Middorsal dark band indistinct or absent, except for a short streak of dark pigment on either side of base of dorsal fin. Dark pigment present around posterior margin of anus, base of anal fin and in a narrow midventral dark band on caudal peduncle. (NOTE: anal pigmentation may be concealed by swollen vent in mature, spawning fish.) Anal rays always 8 or more.

mimic shiner, ***Notropis volucellus***
(see also choice **24b**)

30b
Middorsal dark band well defined, but may not be continuous around base of dorsal fin. No dark pigment around posterior margin of anus (but *Notropis stramineus* may have some dark pigment along base of anal fin and ventral surface of caudal peduncle). Anal rays 6 to 10.

go to choice **31**

31a (30b)
Lateral line marked by dark pigment around edges of lateral line pores.

go to choice **32**

31b
Little or no dark pigment around edges of lateral line pores, especially posterior to dorsal fin.

go to choice **33**

32a (31a)
Pharyngeal teeth 1,4-4,1. Posterior tip of upper jaw extends to at least anterior margin of eye. Body profile arched dorsally, nearly flat ventrally. Middorsal stripe relatively broad, tapering toward base of tail, and continuous around base of dorsal fin. Anal rays 8, rarely 7.

bigmouth shiner, ***Notropis dorsalis***

32b
Pharyngeal teeth 0,4-4,0. Posterior tip of upper jaw not reaching to below anterior margin of eye. Both back and belly profiles are arched, the belly less than the back. Middorsal stripe relatively narrow, with a wedge-shaped expansion in front of the leading edge of the dorsal fin, not continuous around the base of the dorsal fin. Anal rays 7, rarely 6.

sand shiner, ***Notropis ludibundus***

33a (31b)
Distinct black spot at base of caudal fin.

spottail shiner, ***Notropis hudsonius***

33b
No black spot at base of caudal fin.

go to choice **34**

34a (33b)
Scales on sides anterior to dorsal fin more than twice as high as long. Scales on nape distinctly crowded and smaller than scales on sides. Anal rays 9 or 10, rarely 8.

common shiner, ***Luxilus cornutus***
(see also choice **23a**)

34b
Scales on sides less than twice as high as long. Scales on nape about the same size as lateral scales. Anal rays 7 to 9.

go to choice **35**

35a (34b)
Dorsal fin with dark pigment on membranes between last three rays, forming a distinct spot in specimens over about 3.5cm TL. Anal rays 8, sometimes 7 or 9. Pharyngeal teeth usually 1,4-4,0, but may be 1,4-4,1, 0,4-4,1 or rarely 0,4-4,0.

spotfin shiner, ***Cyprinella spiloptera***
(see also choice **24a**)

35b
Dorsal fin without a dark spot. Dark pigment, if present, not limited to membranes between last three rays. Anal rays 7, rarely 8. Pharyngeal teeth usually 2,4-4,2, but may be 2,4-4,1 or 1,4-4,2.

river shiner, ***Notropis blennius***

KEY TO THE SUCKERS (Family Catostomidae)

1a
Dorsal fin with 23 or more rays, and the rays of the anterior 1/3 or so notably longer than those of the posterior 2/3 of the fin. Gill rakers on first arch 30 or more, the longest more than 2 percent of total length. Lips with little or no fleshy expansion, the greatest anterior-posterior length of the lower lip being 1/3 or less the eye diameter.

go to choice **2**

1b
Dorsal fin shorter, with 17 or fewer rays, and a smooth gradation in fin ray length from longer anterior to shorter posterior rays. Gill rakers 30 or fewer, the longest 2 percent or less of the total length. Lips with fleshy expansions, the greatest anterior-posterior length of the lower lip being 1/2 or more the eye diameter.

go to choice **4**

2a (1a)
Mouth inferior and lower lip with small but distinct fleshy expansions. Longest anterior dorsal rays 4 or more times the length of the shortest dorsal rays.

quillback, ***Carpiodes cyprinus***

2b
No fleshy expansions of lips. Longest anterior dorsal rays 3 or fewer times the length of the shortest dorsal rays.

go to choice **3**

3a (2b)
Mouth nearly terminal and oblique. Anterior tip of upper jaw about at same level as the lower margin of the eye.

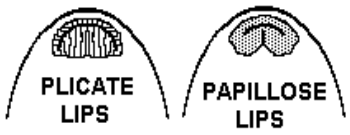
bigmouth buffalo, ***Ictiobus cyprinellus***

3b
Mouth inferior, overhung by snout and nearly horizontal. Anterior tip of upper jaw well below level of lower margin of eye.

smallmouth buffalo, *Ictiobus bubalus*
OTTER TAIL RIVER (RED RIVER DRAINAGE) U.S.A.

4a (1b)
51 or fewer scales in lateral line, and scales not notably smaller or crowded on body anterior to dorsal fin. Lips plicate, with longitudinal and often transverse folds, or papillose.

go to choice **5**



4b
53 or more scales in lateral line, and scales anterior to the dorsal fin smaller and more crowded than those on caudal peduncle. Lips always papillose.

genus ***Catostomus***
go to choice **9**

5a (4a)
Lips papillose. Top of head between eyes is concave. Body marked with a series of 4 – 6 dark blotches.

northern hog sucker, *Hypentelium nigricans*
OTTER TAIL RIVER, (RED RIVER DRAINAGE) U.S.A.

5b
Lips plicate, body colour uniform, without dark blotches.

redhorses, genus *Moxostoma*
go to choice **6**

6a (5b)
Sixteen scales around caudal peduncle. Lips have longitudinal grooves only, no transverse grooves. Rear margin of lower lip makes a shallow, forward pointing V.

greater redhorse, ***Moxostoma valenciennesi***
SHEYENNE RIVER, U.S.A.

6b
11-14 scales around caudal peduncle. Lower lip has transverse grooves as well as longitudinal folds.

go to choice **7**

7a (6b)
Dorsal rays usually 15 or more (rarely 14). Lower lip thin, its rear margin forming a deep forward-pointing V (see Diagram 1). Head long, its length contained 3.5or fewer times in standard length.


DIAGRAM 1

silver redhorse, ***Moxostoma anisurum***

7b
Dorsal rays 14 or fewer. Lower lip thicker, its rear margin nearly straight, or forming a shallow forward-pointing V. Head shorter, its length contained 4 or more (usually 5 or more) times in standard length.

Go to choice **8**

8a (7b)
Rear margin of lower lip straight, or nearly so (see Diagram 2). Caudal fin red, in life.

shorthead redhorse, ***Moxostoma macrolepidotum***


DIAGRAM 2

8b
Rear margin of lower lip forming a shallow, forward-pointing V (see Diagram 3). Caudal fin yellow, in life.


DIAGRAM 3

golden redhorse, ***Moxostoma erythrurum***

9a (4b)
More than 90 lateral line scales. Snout projects beyond upper lip by a distance greater than the thickness of the upper lip.

longnose sucker, ***Catostomus catostomus***

9b
Fewer than 74 lateral line scales. Snout projects beyond upper lip only by a distance equal to or (usually) less than the thickness of the upper lip.

white sucker, ***Catostomus commersoni***

KEY TO THE CATFISH (Family Ictaluridae)

1a
Adipose fin forming a long, low ridge, either continuous with the dorsal edge of the caudal fin, or separated from it by a notch. Ten or fewer gill rakers.

genus ***Noturus***
go to choice **2**

1b
Adipose fin shorter, forming a distinct tab with a free posterior end, and well separated from the caudal fin. Eleven or more gill rakers.

go to choice **3**

2a (1a)
Posterior margin of caudal fin nearly straight, and upper and lower edges of caudal fin light coloured. Premaxillary tooth patch with posterior extensions at each end. A crescent-shaped pale patch on back just behind dorsal fin. Adipose fin separated from caudal fin by a notch.

stonecat, ***Noturus flavus***

2b
Posterior margin of caudal fin rounded, and caudal fin uniformly dark coloured. No posterior extensions at ends of premaxillary tooth patches. No pale patch on back. Adipose fin continuous with caudal fin.

tadpole madtom, ***Noturus gyrinus***

3a (1b)
Caudal fin deeply forked. Colour in life grey above, fading to white or pinkish below. Fish up to about 45 cm usually have black spots scattered on back and sides, and have a bony ridge on the back between the back of the skull and the dorsal fin. Both of these features become indistinct or are lost in larger fish.

channel catfish, ***Ictalurus punctatus***

3b
Posterior margin of caudal fin slightly rounded, straight or slightly indented, but not deeply forked. Colour in life varies from dark olive, or almost black above in young to brownish or even yellowish-brown above in adult fish, fading in all cases to yellowish or white below. Back and sides may be mottled, but no black spots.

genus *Ameiurus*
go to choice 4

4a (3b)
24 – 27 anal rays. Chin barbels whitish. Posterior margin of caudal fin rounded.

yellow bullhead, *Amieurus natalis*
BOIS DE SIOUX RIVER AND OTTERTAIL RIVER
HEADWATER LAKES, U. S. A.

4b
15 – 24 anal rays. Chin barbels grey to black. Posterior margin of caudal fin more or less straight.

go to choice **5**

5a (4b)
14 or fewer gill rakers on first arch. Median notch in anterior margin of supra ethmoid bone about as deep as wide (see diagram 1). Colour brown to yellowish-brown, with darker mottling, especially in larger fish. Fin membranes between rays of caudal and anal fins about same colour as fin rays, and no indistinct pale bar at base of caudal fin.


Diagram 1

brown bullhead, ***Ameiurus nebulosus***

5b
15 or more gill rakers on first arch. Median notch in anterior margin of supra ethmoid bone at least twice as wide as deep (see diagram D). Colour olive green to brown, without mottling, even in largest fish. Fin membranes between rays of caudal and anal fins black, and notably contrasting with paler rays. An indistinct pale bar at base of caudal fin.


Diagram 2

black bullhead, ***Ameiurus melas***

NOTE: **Flathead catfish**, ***Pylodictis olivaris***, differs from Channel Catfish and both bullheads by having the **lower jaw projecting beyond the upper jaw**, and the **head flattened**, so that the greatest depth at the back of the skull is less than 1/2 the head length. The flathead catfish has not been collected in the Hudson Bay Drainage, but it is included here because of persistent angler reports of large (over 5kg) "bullheads" from the Red River. Most anglers in Southern Manitoba can identify the channel catfish and would not confuse it with a bullhead. Flathead catfish resemble bullheads, but grow to large size.

KEY TO THE PIKES (Family Esocidae)

1a
Twelve or more mandibular pores(counting pores on both sides of the lower jaw). Lower 1/2 of cheek lacks scales. Colour pale with darker markings, irregular brownish blotches or wavy diagonal bars. Young with a prominent middorsal light stripe.

muskellunge, ***Esox masquinongy***

1b
Eleven or fewer mandibular pores. Cheeks completely covered by scales. Colour dark with lighter markings, wavy diagonal bars in young, irregular series of oval spots in larger fish. No middorsal light stripe, or only discontinuous portions of one in young.

northern pike, ***Esox lucius***

KEY TO THE TROUT AND WHITEFISH (Family Salmonidae)

1a
Well-developed teeth always present.

go to choice **2**

1b
Teeth absent EXCEPT that minute teeth may occur in under yearlings.
(whitefish, subfamily Coregoninae)

go to choice **10**

2a (1a)
Dorsal fin with 17 or more rays. 103 or fewer scales in the lateral line.

arctic grayling, ***Thymallus arcticus***
(Subfamily Thymallinae)

2b
Dorsal fin with 15 or fewer rays. 115 or more scales in the lateral line.
(trout, salmon and char, subfamily Salmoninae)

go to choice **3**

3a (2b)
13 or more anal rays. Few, or usually no black spots on body. NOTE: A series of dusky vertical bars (called parr marks) are seen on juveniles, but lost in adults.

kokanee salmon, ***Oncorhynchus nerka***
INTRODUCED

3b
12 or fewer anal rays. Body marked with well-defined black spots, pale, or sometimes pink or red spots or pale vermiculations (wormlike markings). NOTE: These markings may be masked by silvery pigment in lake and sea-dwelling fish.

go to choice **4**

4a (3b)
Body with black spots on a lighter background. Vomerine teeth extending down midline of roof of mouth as far back as anterior margin of eye. Scales not tiny and embedded. Leading edges of pectoral, pelvic and anal fins the same colour as the rest of the fin. (The anal fin may have a pale tip).

go to choice **5**

4b
Body with lighter spots or vermiculations on a darker background. Vomerine teeth confined to front of mouth and continuous with palatine teeth. Scales tiny and embedded. Pectoral, pelvic and anal fins with a white leading edge.

genus ***Salvelinus***
go to choice **7**

5a (4a)
Caudal fin usually unmarked or with a few indistinct dark markings. Some spots on sides are surrounded by light halos. A few red spots may be present on sides.

brown trout, ***Salmo trutta***
INTRODUCED

5b
Caudal fin with black spots arranged along caudal rays. No light coloured halos or red spots on body.

go to choice **6**

6a (5b)
Underside of lower jaw with red or orange-red slash marking on each side. Small teeth usually present at rear of tongue between bases of anterior gill arches.

cutthroat trout, ***Oncorhynchus clarki***
INTRODUCED

6b
Underside of lower jaw unmarked or with pale pinkish or yellowish mark on each side. No teeth at rear of tongue between bases of anterior gill arches.

rainbow trout, ***Oncorhynchus mykiss***
INTRODUCED

7a (4b)
Caudal fin distinctly forked, even when spread. Top and sides of head with distinct pale spots and/or vermiculations.

go to choice **8**

7b
Caudal fin square or only slightly indented when spread. No pale markings on sides of head.
go to choice **9**

8a (7a)
Pyloric cecae 93-208. Pale spots distributed profusely on body, top and sides of head, and dorsal and caudal fins. Caudal fin deeply forked.
lake trout, ***Salvelinus namaycush***

8b
Pyloric cecae 65-85. Pale spots and vermiculations on head and body, but less densely distributed than above. Few or no pale markings on dorsal or caudal fins. Caudal fin forked, but not deeply.
splake, ***Salvelinus namaycush* X *S. fontinalis***
MAN MADE HYBRID

9a (7b)
Pectoral, pelvic and anal fins with a distinct black streak posterior to white leading edge. Back and dorsal fin with pale vermiculations.
brook trout, ***Salvelinus fontinalis***

9b
No dark streak behind white leading edges of pectoral, pelvic and anal fins. Oval or round pale spots on back, but not on dorsal fin.
arctic char, ***Salvelinus alpinus***
FRESHWATER, NORTH OF CHURCHILL RIVER AND
ANADROMOUS, SPAWNING IN STREAMS ON HUDSON BAY COAST

10a (1b)
Nostril divided by a single flap of skin. 20 or fewer gill rakers on first arch.
round whitefish, ***Prosopium cylindraceum***

10b
Nostril divided by double flap of skin. 22 or more gill rakers on first arch.
genus ***Coregonus***
go to choice **11**

11a (10b)
33 or fewer gill rakers on first arch.
go to choice **12**

11b
32 or more gill rakers on first arch.
go to choice **13**

12a (11a)
Mouth inferior, distinctly overhung by snout.
lake whitefish, ***Coregonus clupeaformis***

12b
Mouth terminal, or nearly so.
shortjaw cisco, ***Coregonus zenithicus***
(see also choice **13a**)

13a (11b)
43 or fewer gill rakers on first arch. Lower jaw usually not projecting beyond upper jaw. Premaxillae making a distinct, downturned angle in profile of the snout.
shortjaw cisco, ***Coregonus zenithicus***
(see also choice **12b**)

13b
36 or more (usually 40 or more) gill rakers on first arch. Lower jaw usually projects slightly beyond upper jaw. Premaxillae not making an angle in snout profile.
lake cisco, ***Coregonus artedii***

NOTE: It is not possible to distinguish all individual *Coregonus artedii* from all individual *C. zenithicus*, especially on the basis of a few characters. Choices 12b, 13a and 13b are based on the differentiation by Clarke (1973), but are greatly simplified. They should work most of the time if both species are available from the same lake for comparison. They will probably not work for samples of either species alone from different lakes. These choices are set up so that if an incorrect identification is made, it should be *C. zenithicus* being misidentified as *C. artedii*. So far as known, *C. zenithicus* does not occur in the absence of *C. artedii* in Manitoba.

KEY TO THE SMELTS (Family Osmeridae)

1a
Strong fang-like teeth on the tongue, lower jaw and palatines. 62-72 scales in lateral series, with lateral line incomplete.

rainbow smelt, ***Osmerus mordax***
INTRODUCED

1b
Tiny villiform teeth on tongue and lower jaw. No teeth on palatines. 170-220 scales in complete lateral line.

capelin, ***Mallotus villosus***
MARINE, ENTERING ESTUARIES ON HUDSON BAY COAST

KEY TO THE STICKLEBACKS (Family Gasterosteidae)

1a
Three dorsal spines. Gill membranes joined to isthmus. Bony plates on sides of body.

threespine stickleback, ***Gasterosteus aculeatus***
FRESHWATER IN SEAL RIVER AND ANADROMOUS,
SPAWNING IN STREAMS ON HUDSON BAY COAST

1b
At least 4, usually 5 or more dorsal spines. Posterior margin of gill membranes free from isthmus. No scales or plates on body.

go to choice **2**

2a (1b)
7 or more dorsal spines, alternately slanted to right and left of dorsal midline. A laterally projecting keel on the narrow caudal peduncle on each side of the base of the tail.

ninespine stickleback, ***Pungitius pungitius***

2b
Usually 6 or fewer dorsal spines, all vertical, not slanted. No keels on caudal peduncle, and caudal peduncle deeper, about equal in depth to the eye diameter.

brook stickleback, ***Culaea inconstans***

KEY TO THE SCULPINS (Family Cottidae)

1a
Posterior margin of gill membranes free from isthmus. 3 or 4 preopercular spines. Second preopercular spine protrudes through skin and points rearward. A pair of nasal spines on top of snout, behind upper jaw. Anterior and posterior dorsal fins separated by a distinct gap.

go to choice **2**

1b
Posterior margin of gill membranes joined to isthmus. Second preopercular spine covered by skin and pointing downward. Usually 3 preopercular spines. (Occasionally four preopercular spines in *Cottus ricei*, see choice 3a). No nasal spines. Anterior and posterior dorsal fins touching, or nearly so.

genus ***Cottus***
go to choice **5**

2a (1a)
3 preopercular spines, 1 directed downward or forward, 2 directed rearward. Top of head decorated with sharp, bony spines and/or fleshy cirri, not 4 rough-topped bony knobs.

Genus ***Myoxocephalus***
go to choice **3**

2b
4 preopercular spines. Two directed rearward, two directed forward or downward. 4 bony, knoblike projections on top of head, two just behind eyes and two near rear corners of head. An irregular row of distinct, prickle-like scales on each side above lateral line.

genus ***Triglopsis***
go to choice **4**

3a (2a)
14-16 pectoral fin rays. Fleshy cirri, not sharp, bony spines, over eyes.

Shorthorn sculpin, *Myoxocephalus scorpius*
MARINE, ENTERING ESTUARIES ON HUDSON BAY COAST

3b
17-18 pectoral fin rays. Sharp, bony spines over the eyes, not fleshy cirri.

Arctic sculpin, *Myoxocephalus scorpioides*
MARINE, ENTERING ESTUARIES ON HUDSON BAY COAST

4a (2b)
4 rough, bony, knoblike projections on top of head, 2 just behind eyes and 2 at rear corners of head. An irregular row of prickles running along each side below dorsal fin.

fourhorned sculpin, ***Triglopsis quadricornis***
MARINE, ENTERING ESTUARIES ON HUDSON BAY COAST

4b
No bony, knoblike projections on head. Prickles on sides small, more easily felt than seen.

deepwater sculpin, ***Triglopsis thompsoni***

5a (1b)
Upper preopercular spine long and curved upward. A single pore at midline on tip of chin. Lateral line complete to base of caudal fin.

spoonhead sculpin, ***Cottus ricei***

5b
Upper preopercular spine shorter and straight, or nearly so. Two pores at tip of chin, one on either side of midline. Lateral line does not reach base of caudal fin.

go to choice **6**

6a (5b)
Pelvic fins with 4 fully developed rays. Palatine teeth present. Lateral line extends to below posterior half of second dorsal fin, with 23-36 pores. Anal fin with 12-14 rays.

mottled sculpin, ***Cottus bairdi***

6b
Pelvic fins with 3 fully developed rays. Palatine teeth absent. Lateral line stops before middle of second dorsal, with 12-25 pores. Anal fin with 10-12 rays.

slimy sculpin, ***Cottus cognatus***

KEY TO THE SUNFISHES (Family Centrarchidae)

1a
3 anal spines.

go to choice **2**

1b
More than 3 anal spines.

go to choice **8**

2a (1a)
Anterior and posterior dorsal fins divided by a distinct notch. Mouth large, the posterior tip of the maxilla reaching to or beyond middle of eye. 55 or more lateral line scales. Maximum body depth 1/3 or less the standard length.

genus ***Micropterus***
go to choice 3

2b
Anterior and posterior dorsal fins not divided by a notch. Mouth smaller, the posterior tip of the maxilla reaching at most, to below middle of eye, and usually only to anterior margin of eye. 50 or fewer lateral line scales. Maximum body depth more than 1/3 the standard length.

genus ***Lepomis***
go to choice **4**

3a (2a)
Posterior tip of maxilla not extending beyond posterior margin of eye. Anterior and posterior dorsal fins broadly connected, the shortest spine in the notch dividing the two being 1/2 or more the length of the longest dorsal spine. 3 dark bands on cheek, radiating rearward from eye. Sides of body with a series of 8 or more indistinct vertical bars, which become very difficult to see on large fish.

smallmouth bass, ***Micropterus dolomieui***
INTRODUCED

3b
Posterior tip of maxilla extending beyond rear margin of eye. Anterior and posterior dorsal fins narrowly connected, the shortest spine in the notch dividing the two less than 1/2 as long as the longest dorsal spine. No radiating bands on cheek or vertical bars on sides, but a broad dark lateral band extends from tip of snout to base of tail. This band becomes indistinct on large fish.

largemouth bass, ***Micropterus salmoides***
INTRODUCED

4a (2)
Mouth reaches past anterior margin of eye. Posterior margin of pectoral fin convex, and its tip rounded to bluntly pointed.

go to choice **5**

4b
Mouth reaches no farther back than anterior margin of eye. Posterior margin of pectoral fin straight or somewhat concave (falcate), and its tip sharply pointed.

go to choice **7**

5a (4a)
Sides marked with brilliant orange spots in life, and cheeks with both orange spots and longitudinal orange streaks. Pectoral fin length about 1/3 the body length to base of tail.

orangespotted sunfish, ***Lepomis humilis***
RED RIVER DRAINAGE, U.S.A.

5b
No orange spots or streaks on cheeks or sides. Pectoral fin length less than 1/3 the body length to base of tail.

go to choice **6**

6a (5b)
14 long, slender gill rakers on lower limb of first arch. 8-10 scale rows between lateral line and origin of dorsal fin.

green sunfish, ***Lepomis cyanellus***
RED RIVER DRAINAGE, U.S.A. AND RAINY RIVER, ONTARIO

6b
12 short, stumpy gill rakers on lower limb of first arch. 4-6 scale rows between lateral line and origin of dorsal fin.

longear sunfish, ***Lepomis megalotis***
RED RIVER DRAINAGE, U.S.A. AND RAINY RIVER, ONTARIO

7a (4b)
Black opercular flap with a pale posterior margin, usually with a bright orange or red spot in it in life. 8 short gill rakers on lower limb of first arch. No black blotch on lower rear corner of posterior dorsal fin.

pumpkinseed, ***Lepomis gibbosus***

7b
Opercular flap black to posterior margin, no pale edge or orange spot. 12 longer more slender gill rakers on lower limb of first arch. A large black blotch on lower rear corner of posterior dorsal fin.

bluegill, ***Lepomis macrochirus***

8a (1b)
10 or more dorsal spines. Base of anal fin distinctly shorter than base of dorsal fin.

rock bass, ***Ambloplites rupestris***

8b
8 or fewer dorsal spines. Base of anal fin about as long as or slightly longer than base of dorsal fin.

genus ***Pomoxis***
go to choice **9**

9a (8b)
6 dorsal spines. Distance from snout to dorsal origin about equal to distance from dorsal origin to middle of base of tail. Body silvery, with 5-10 indistinct vertical bars which may be very hard to see on small fish.

white crappie, ***Pomoxis annularis***
INTRODUCED

9b
7 or 8 dorsal spines. Distance from snout to dorsal origin less than the distance from dorsal origin to middle of base of tail. Body silvery, with an irregular network of black markings which extend onto dorsal, caudal and anal fins. This is faded and indistinct on small fish, which may resemble White crappies in colour and markings.

black crappie, ***Pomoxis nigromaculatus***
INTRODUCED

KEY TO THE PERCH (Family Percidae)

1a
Maxilla reaching to below or beyond middle of eye. Lower edge of preopercular bone with serrate (sawtooth) edge.

go to choice **2**

1b
Maxilla reaching only to, or a little past, anterior margin of eye. Lower edge of preopercular bone smooth.

go to choice **4**

2a (1a)
Teeth small, not strong and fang-like. Posterior dorsal fin with 15 or fewer soft rays. Anal fin with 8 or fewer soft rays.

yellow perch, ***Perca flavescens***

2b
Large, fang-like teeth on lower jaw and roof of mouth. Posterior dorsal fin with 17 or more soft rays, and anal fin with 12 or more soft rays. Lateral line extending onto the base of the caudal fin.

genus ***Stizostedion***
go to choice **3**

3a (2b)
Membrane of first dorsal fin dusky anteriorly, with the pigment concentrated into a black blotch posteriorly. 3 pyloric caecae, each about as long as the stomach. Cheek scaleless. Lower rear corner of caudal fin white.

walleye, ***Stizostedion vitreum***

3b
Membrane of first dorsal fin pale, marked with 3 rows of black spots. Usually 5 or more pyloric caecae, none as long as the stomach. Cheek scaled. Lower edge of caudal fin with a pale streak, but no white patch in lower rear corner.

sauger, ***Sander canadense***

4a (1b)
Belly covered by normal scales. Anal fin smaller than the posterior dorsal fin.

genus ***Etheostoma***
go to choice **5**

4b
One or two enlarged, modified scales between the bases of the pelvic fins and belly either naked or with a median row of enlarged scales. Anal fin nearly the same size or larger than the posterior dorsal fin.

genus ***Percina***
go to choice **8**

5a (4a)
Lateral line complete to base of caudal fin.

go to choice **6**

5b
Lateral line incomplete, extending no farther than to below anterior half of posterior dorsal fin.

go to choice **7**

6a (5a)
Only one anal spine. Anterior dorsal fin with 7 –9 spines. Upper lip separated from snout by a continuous groove. A series of w-shaped black markings on sides.

johnny darter, ***Etheostoma nigrum***

6b
Two anal spines. Anterior dorsal fin with 8 – 13 spines. Groove separating upper lip from snout is not continuous across the midline. Sides with dusky vertical bars, but never w – shaped markings.

rainbow darter, *Etheostoma caeruleum*
OTTER TAIL RIVER (RED RIVER DRAINAGE) MINNESOTA.

7a (5b)
Anterior dorsal fin with 8 – 12 spines. Posterior dorsal fin with 1 spine and 10-12 soft rays. Cheeks scaled. Lateral line extends to below posterior dorsal fin.

Iowa darter, ***Etheostoma exile***

7b

Anterior dorsal fin with 5 – 7 spines. Posterior dorsal fin with 1 spine and 8 or 9 soft rays. Cheeks scaleless. Lateral line absent, or at most, only 8 or so scales with pores just behind head.

least darter, ***Etheostoma microperca***
RED RIVER TRIBUTARIES, U.S.A.

8a (4b)

Tip of snout conical, pointed and projecting beyond upper jaw. A series of 9 or more narrow, vertical, somewhat irregular dark bars on sides.

logperch, ***Percina caprodes***

8b

Tip of snout does not project beyond upper jaw. Various dark markings on sides, but never narrow vertical bars.

go to choice **9**

9a (8b)

Cheeks scaled. A series of dusky blotches, sometimes indistinct, on sides. Anterior dorsal fin with a dark blotch at upper anterior and lower posterior corners.

river darter, ***Percina shumardi***

9b

Cheeks scaleless. A series of large, oval, black blotches on sides, which may be so broadly connected as to form a dark lateral band. Anterior dorsal fin uniformly dusky, no dark blotches.

blackside darter, ***Percina maculate***

GLOSSARY OF TERMS USED IN THE KEY TO THE FRESHWATER FISHES OF MANITOBA

adipose fin A fleshy tab or ridge-like **median** fin on the back, between the back of the **dorsal fin** and the base of the tail.

ammocoetes larva The larval stage of lampreys (Family Petromyzontidae). Ammocoetes larvae burrow in sand or silt in the bottom of the streams and feed by pumping a current of water through their gill chambers and filtering organic detritus and minute plants and animals from it. They have a hood-like covering over the mouth opening (the **oral hood**), and the eyes are undeveloped.

anadromous Fish which live in the sea and migrate into fresh water to spawn.

anal fin The **median** fin on the underside of the fish between the base of the tail and the **vent**.

anterior Toward the front or head of the fish.

anus The posterior opening of the digestive system. Often used as a synonym for **vent**.

axil The area in the angle between the base of a **paired fin** and the side of the body.

band A relatively broad, sometimes indistinct **longitudinal** marking.

bar A vertical marking.

barbels "Whisker" – like structures on the head of a fish, located in the area of the mouth or nostrils, which usually serve a taste or small function.

blotch A relatively large, sometimes indistinct or irregular marking.

branchiostegals Thin bony supports in the lower part of the **gill membrane**, below the bony part of the **operculum**.

breeding (or **nuptial**) **tubercles** Horney structures developing on the skin of the head, and sometimes the fins and body surface, at breeding time, in male fish, especially minnows, suckers and whitefish.

buccal funnel In adult lampreys, the round, funnel-like mouth cavity.

caudal fin The tail fin.

caudal peduncle The part of the body between the **posterior** end (**insertion**) of the **anal fin** and the base of the **caudal fin**.

cheek A region of the side of the head of a fish, located behind the eye, above the upper jaw and in front of the **preopercular bone**.

ctenoid (scales) Thin, flexible, overlapping scales with small teeth (or cteni) on the exposed **posterior fields** of the scales.

cusp The projecting, often pointed, part of a tooth.

cyclois (scales) Thin, flexible, overlapping scales which lack cteni on the exposed **posterior fields**.

decurved Curved downward, as in a decurved mouth or **lateral line**.

depressed Flattened from top-to-bottom, rather than side-to-side.

dorsal Pertaining to the upper surface or back.

dorsal fin Any of the one to three **ray**-and/or **spine**-supported median fins on the back, (The **adipose fin** does not have supporting rays or spines).

dorsoventral The body axis or direction from the back to the belly or underside.

elongate A fish or structure which is longer, and usually more slender than normal. Pike or burbot, for example are elongate.

falcate (fin) A fin with a concave margin.

frenum A narrow, fleshy ridge on the **dorsal** midline, joining the upper lip and the **snout**.

ganoid (scales) Thick, **rhombic**, very hard scales which appear to join edge-to edge, rather than overlapping, with a shiny outer covering of enamel-like material (ganoine).

gill arch The bony arch supporting a gill, together with the soft gill filaments, on its **posterior** side and the bony, tooth-like **gill rakers** on its anterior side.

gill membrane The membrane on the rear edge of the **operculum** that helps seal the gill opening which the fish is taking water or food into its mouth. If often continues across the throat and joins the gill membrane on the opposite side. The thin, rod-like, bony, **branchiostegals** support the gill membrane below the **operculum**.

gill rakers The tooth-, bristle-, or comb-like structures on the **anterior** surface of a **gill arch**. They help the fish in feeding and also protect the gill filaments from large or hard objects that might injure them.

heterocercal (tail) A **caudal fin** in which the body turns into the upper lobe. Usually, the tail is asymmetrical, with the upper lobe longer than the lower lobe, like a sturgeon or shark tail.

homocercal (tail) A **caudal fin** in which the body does not turn into the upper lobe. A homocercal tail is almost always symmetrical, with the upper and lower lobs being equal in size.

included (lower jaw) The margin of the lower jaw is inside of the margin of the upper jaw. In this case, the mouth is also **inferior**.

inferior (mouth) A mouth in which the upper jaw and/or **snout** overhang the lower jaw. In this case, the lower jaw is also **included**.

infraoral lamina In lampreys, the horny tooth plate just below the mouth opening in the center of the **buccal funnel**.

insertion The point where the posterior end of a fin joins the body.

interopercular The lowermost and smallest of the enlarged, plate-like bones forming the operculum.

isthmus The narrow bridge of tissue connecting the ventral surface of the abdomen with the underside of the head.

lateral Toward either side of the body.

lateral line A system of canals running through superficial bones on the head and under the skin, through the scales (if present) on the sides of the body of a fish. It opens to the surface through a series of pores, typically one pore in each lateral line scale along the sides of the body. On the head, pores can be seen around the eye socket (**supra-and sub-orbital** pores) along the lower surface of the lower jaw, (**mandibular** pores) and down the side of the head, behind the check, (**preopercular** pores).

longitudinal lengthwise.

mandibular pores (of the **lateral line**) are on the underside of the lower jaw. The location and number of these pores is useful in identifying some species of fish.

maxilla (ae) The bones forming the **lateral** margins of the upper jaw in primitive fish such as mooneye and goldeye, trout, smelt, mudminnows and pike. In more advanced fish, they are usually located just above the margin of the upper jaw, although in catfish, they are hidden within the base of the **maxillary barbell**.

median Located on the midline of the body (**such as dorsal, adipose, caudal and anal** fins).

oblique (mouth) An upwardly angled mouth.

opercular (bone) The uppermost and largest of the broad, plate-like bones in the **operculum**.

opercular flap A fleshy flap or tab at the upper, **posterior** corner of the **operculum**. It is part of the **gill membrane**.

operculum The gill cover, consisting of four bones; the **preopercular**, anteriorly, just behind the cheek, and behind it, from top to bottom, the **opercular, subopercular, interopercular**, and **branchiostegals**; together with the **gill membrane**.

oral disc In lampreys, another term for the **buccal funnel**.

oral hood In the ammocoetes larvae of lampreys, the hood-like structure forming most of the front of the head, which surround the mouth cavity.

origin The point where the **anterior** end of a fin joins the body.

paired fins Fins that are in pairs, with one member of the pair on each side of the **midline**. **The pectoral** and **pelvic fins** of fish.

palatine(s) The bones forming the **anterior** part of the roof of the mouth in fish. They often have rows or pads of teeth.

spot A small, sharply defined, usually round, marking.

stripe A narrow marking running lengthwise of a fish's body (or fins).

subterminal (mouth) The upper jaw, but not the snout, projects beyond the lower jaw (See also **included** lower jaw).

subopercular (bone) The plate-like bone of the **operculum** located beneath the **opercular** and above the **interopercular**.

suborbital Located below the eye (as bones, pores, markings, etc.).

superior (mouth) The lower jaw projects beyond the upper jaw, and the mouth is also **oblique**.

supraorbital Located above the eye (as bones, pores, spines, markings, etc.).

terminal (mouth) A mouth located at the anteriormost point of the head, in which neither the upper nor lower jaw projects beyond the other, and the **snout** does not project **anterior** to the mouth.

traverse running from side-to-side of the body.

vent The posterior opening of the digestive and urogenital system. Also called the **anus**.

ventral Toward the underside; the underside.

ventral (mouth) A mouth on the underside of the head, well behind the tip of the **snout**.

vermiculations Irregular, "worm-track" – like markings on the body and/or some fins of a fish.