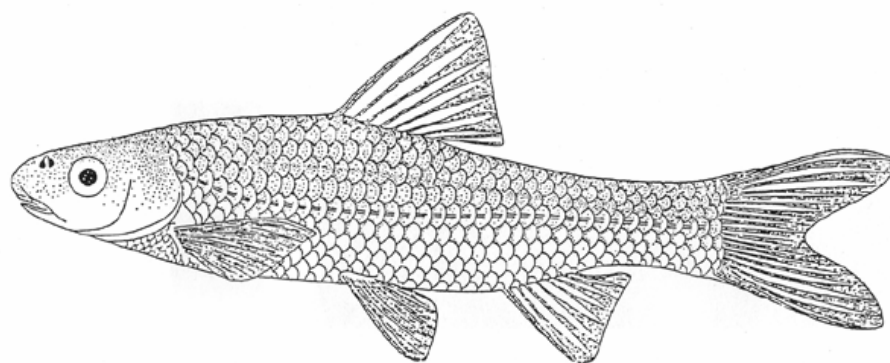


COSEWIC
Assessment and Status Report

on the

Western Silvery Minnow
Hybognathus argyritis

in Canada



THREATENED
2001

COSEWIC
COMMITTEE ON THE STATUS OF
ENDANGERED WILDLIFE
IN CANADA



COSEPAC
COMITÉ SUR LA SITUATION DES
ESPÈCES EN PÉRIL
AU CANADA

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COSEWIC Assessment Summary

Assessment Summary – November 2001

Common name

Western Silvery Minnow

Scientific name

Hybognathus argyritis

Status

Threatened

Reason for designation

This species is known in Canada from two rivers in Alberta, one of which flows through short-grass prairie that is subject to continuous erosion leading to increased siltation.

Occurrence

Alberta

Status history

Designated Special Concern in April 1997. Status re-examined and designated Threatened in November 2001. Last assessment based on an existing status report with an addendum



COSEWIC

Executive Summary

from the 1997 Status Report

Western Silvery Minnow

Hybognathus argyritis

Description

The average size of the Western Silvery Minnow (*Hybognathus argyritis*) is approximately 76 mm in length with a maximum length of 125 mm. The body is elongate, moderately compressed laterally and has a stout caudal peduncle. The head is short, bluntly triangular with a moderately large eye; the snout is rounded and overhangs the mouth which is subterminal. There is one dorsal fin with eight rays originating slightly in advance of the origin of the pelvic fins which have eight rays, but sometimes seven. The caudal fin is forked; the anal fin originates behind the posterior margin of the depressed dorsal and usually has eight rays, sometimes nine; the pectoral fins are relatively short with 15 or 16 rays.

Small nuptial tubercles may be found on the head, back, sides, and on the fins of breeding individuals (sparse on females, more numerous on males). Both sexes are silvery in colour, hence the common name, with a broad, slaty mid-dorsal stripe. During spawning the males are light yellow along the sides and the lower fins.

Distribution

This is a species of the backwaters of large plains streams found in the Mississippi River basin from the mouth of the Ohio River north to the Missouri Basin and the Milk River in Montana.

In Canada, the Western Silvery minnow is found only in southern Alberta where it is known from the south Saskatchewan River and seven sites on the Milk River.

Population Sizes and Trends

The species is known only from presence and absence data from one collection on the South Saskatchewan River and seven sites on the Milk River in southeastern Alberta. The species was first collected in Alberta from the Milk River in 1961 and subsequent collections between 1971 and 1976 verified its presence at a further six sites along the Milk River, but no further collections have been made from the south Saskatchewan River. The number of specimens collected at each site varied from one

to 26 and one site was visited in 1974 and again in 1976, 26 specimens were taken in 1974 and 2 in 1976, apparently the species has not been looked for since. There is no information available to establish population sizes or trends. The species may have been more abundant in upper reaches of the Milk River prior to 1900. Increased turbidity resulting from channelling of irrigation water into the Milk River in the early 1900s may have caused a decline in the population numbers of the species in its Alberta range. The recovery of the river and its vegetation following cessation of this practice has permitted repopulation well into Alberta.

Habitat

There is very little information available on the habitat requirements of the species and none from Canada. The ideal habitat of the species is probably quiet waters rich in phytoplankton as in the U.S. It is a plains species, usually found in the backwaters and pools of larger, northern plains streams where the gravelly, sand, muck or debris covered bottom is not covered by silt. Spawning only occurs where the rate of bottom siltation is low.

General Biology

The biology and ecology of this species have not been studied, but are probably similar to other species of *Hybognathus*. In Canadian waters, it is believed that the species spawns in May, although no observations have been published.

The diet of the silvery minnows appears to consist of diatoms, algae, and bottom ooze. The pharyngeal papillae found in all species of the Genus may be an accessory filtering system (to the gill arches) adapted for herbivory.

Limiting Factors

Hybognathus argyritis is sensitive to turbidity and siltation which are likely causes of population declines in Missouri and Ohio.

The Milk River flows through short grass prairie habitat which is subject to continuous erosion producing a high rate of silt deposition. Activity such as channelling or overgrazing could increase the already high rate of siltation and lead to extirpation of the species from its Canadian range.

Protection

In the U.S. the species is considered of Special Concern in Wyoming.

In Canada the fish are not subject to any protected status and could not qualify for general protection under Habitat Sections of the Fisheries Act (not commercial species). In Alberta, where the species is considered to be of special concern, general protection could be afforded if required under provincial wildlife and endangered species legislation.

Conclusions

The Western Silvery Minnow has a very limited Canadian range and distribution and is considered a species of special concern in Alberta. It requires clear, weedy habitat free of turbidity, pollution or habitat degradation. The species has obviously been in Alberta for some time, and has been overlooked or perhaps misidentified as the Brassy Minnow until recently. It may be that the species has a refuge here, but industrial, urban and agricultural activity may result in habitat degradation as has occurred for so many species with similar habitat requirements in the northern U.S.



COSEWIC MANDATE

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) determines the national status of wild species, subspecies, varieties, and nationally significant populations that are considered to be at risk in Canada. Designations are made on all native species for the following taxonomic groups: mammals, birds, reptiles, amphibians, fish, lepidopterans, molluscs, vascular plants, lichens, and mosses.

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COSEWIC comprises representatives from each provincial and territorial government wildlife agency, four federal agencies (Canadian Wildlife Service, Parks Canada Agency, Department of Fisheries and Oceans, and the Federal Biosystematic Partnership), three nonjurisdictional members and the co-chairs of the species specialist groups. The committee meets to consider status reports on candidate species.

DEFINITIONS

Species	Any indigenous species, subspecies, variety, or geographically defined population of wild fauna and flora.
Extinct (X)	A species that no longer exists.
Extirpated (XT)	A species no longer existing in the wild in Canada, but occurring elsewhere.
Endangered (E)	A species facing imminent extirpation or extinction.
Threatened (T)	A species likely to become endangered if limiting factors are not reversed.
Special Concern (SC)*	A species of special concern because of characteristics that make it particularly sensitive to human activities or natural events.
Not at Risk (NAR)**	A species that has been evaluated and found to be not at risk.
Data Deficient (DD)***	A species for which there is insufficient scientific information to support status designation.

* Formerly described as “Vulnerable” from 1990 to 1999, or “Rare” prior to 1990.

** Formerly described as “Not In Any Category”, or “No Designation Required.”

*** Formerly described as “Indeterminate” from 1994 to 1999 or “ISIBD” (insufficient scientific information on which to base a designation) prior to 1994.

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was created in 1977 as a result of a recommendation at the Federal-Provincial Wildlife Conference held in 1976. It arose from the need for a single, official, scientifically sound, national listing of wildlife species at risk. In 1978, COSEWIC designated its first species and produced its first list of Canadian species at risk. Species designated at meetings of the full committee are added to the list.



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COSEWIC Status Report

on the

Western Silvery Minnow

Hybognathus argyritis

in Canada

Jim Houston

1997*

*Please note: New information on this species can be found
in an addendum at the end of the report

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SPECIES INFORMATION

Introduction

The Western Silvery Minnow, *Hybognathus argyritis* Girard, 1856, is a small cyprinid (average length » 7.6 cm) of the American mid-west in the Missouri River basin. In Canada, the species is known only from the Milk River and South Saskatchewan river systems in Alberta (Scott and Crossman 1973; Nelson and Paetz 1970, 1992), although Scott and Crossman (1973) give its Canadian range as including southern Manitoba based on one collection from a tributary of the Souris River. However, this citation is in error as the Manitoba specimens, which were catalogued in the Royal Ontario Museum (ROM) collection, were actually verified by E. Holm (ROM) in 1982 as the Brassy Minnow, *Hybognathus hankinsoni*, a sympatric species (K.W. Stewart, Department of Zoology, University of Manitoba, Winnipeg, Manitoba; personal communication).

This synopsis is a result of a request from officials of Alberta Natural Resources to have the species considered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), for possible status determination.

Systematic Note

The genus *Hybognathus* contains seven species in North America, three of which are found in Canada, i.e., the Western Silvery Minnow, the Eastern Silvery Minnow, *Hybognathus regius*, and the Brassy Minnow, (Robins *et al.* 1991; Schmidt 1994). Live specimens of *Hybognathus argyritis* can be distinguished from the sympatric Brassy Minnow by a pointed dorsal fin and silvery colour (Scott and Crossman 1973; Nelson and Paetz 1992), the possession of four scales between the lateral line and the pelvic fins, a thin black line along side of the body partly over the dark lateral band, and five to 12 radiating grooves on scales lateroventral to the dorsal fin (McAllister and Coad 1974). *Hybognathus regius* is confined to the Atlantic drainage and is found in Canada only in southwestern Quebec and southeastern Ontario (see Scott and Crossman 1973; Lee 1980). *Hybognathus nuchalis*, the Mississippi, or Central (Pflieger 1980a), Silvery Minnow occurs in the Mississippi basin and adjacent Gulf slope.

Fishes of this genus are characterized by elongate intestines coiled on the right side, a black peritoneum, and subterminal mouths with crescent-shaped lower jaws, (Scott and Crossman 1973; Page and Burr 1991), and origin of dorsal fin anterior to origin of pelvic fins (McAllister and Coad 1974). Three additional morphological characters that support the monophyly of the genus are the longate anterior processes of the urohyal; enlarged epibranchials; and, organization of pharyngeal papillae (Schmidt 1994).

Along with *Hybognathus regius*, the Western Silvery Minnow was formerly treated as a synonym of *Hybognathus nuchalis*, the Central Silvery Minnow, (Pflieger 1980a,b). Scott and Crossman (1973) treated them as subspecies, namely *Hybognathus nuchalis nuchalis* in the west and *Hybognathus nuchalis regius* in the east. Pflieger (1971)

recommended that *Hybognathus nuchalis*, *Hybognathus argyritis* and *Hybognathus regius* be considered distinct species based on the differences in the shape of the basioccipital process and this has been accepted by the American Fisheries Society (Robins *et al.* 1991). However, Nelson and Paetz (1992) noted a wide range of variation in Milk River specimens and concluded that a more detailed study of the character and its relation to the significance of *Hybognathus* taxonomy is needed. Other recent systematic studies of the genus (Hlohowskyj *et al.* 1989; Schmidt 1994) concluded that *Hybognathus argyritis* was morphologically similar to *Hybognathus regius*, but could be also distinguished from *Hybognathus regius* and *Hybognathus nuchalis* by differences in the pharyngeal papillae that form a pharyngeal filtering apparatus in *Hybognathus*.

Description

The average size of the Western Silvery Minnow (Figure 1) is approximately 76 mm total length (T.L.) with a maximum length of 125 mm T.L. (Pflieger 1980b; Scott and Crossman 1973). Maximum length in Alberta is 10 cm fork length (Nelson and Paetz 1992). The body is elongate, moderately compressed laterally and has a stout caudal peduncle. The head is short, bluntly triangular with a moderately large eye; the snout is rounded and overhangs the mouth which is subterminal. The pharyngeal teeth (0, 4-4, 0) are not hooked and have a distinct grinding surface. There is one dorsal fin with eight rays originating slightly in advance of the origin of the pelvic fins which have eight rays, but sometimes seven. The caudal fin is forked; the anal fin originates behind the posterior margin of the depressed dorsal and usually has eight rays, sometimes nine [eight in Alberta (Nelson and Paetz 1992)]; the pectoral fins are relatively short with 15 or 16 rays. The scales are cycloid with eight to 11 long radii; there is a complete lateral line of 38 to 49 scales [36 to 40 in Alberta specimens (Nelson and Paetz 1992)]. The peritoneum is black and the elongate intestine is coiled on the right side; vertebrae number 36 to 38 (see Scott and Crossman 1973; Trautman 1957), but 39 to 41 in Alberta specimens (Nelson and Paetz 1992).

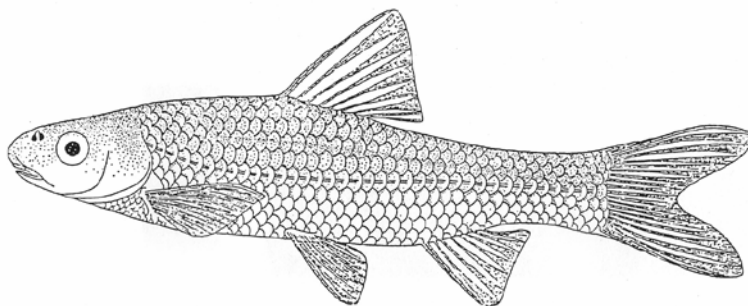


Figure 1. Western Silvery Minnow, *Hybognathus argyritis* (» 70 mm S.L.).

Small nuptial tubercles may be found on the head, back, sides, and on the fins of breeding individuals (sparse on females, more numerous on males). Both sexes are silvery in colour, hence the common name, with a broad, slaty mid-dorsal stripe. Alberta specimens are brownish-yellow dorsally and silver laterally, no lateral band is obvious, but dusky spots may be present (Nelson and Paetz 1992). During spawning the males are light yellow along the sides and the lower fins (Scott and Crossman 1973; Trautman 1957).

DISTRIBUTION

This is a species of the backwaters of large plains streams found in the Mississippi River basin (Figure 2) from the mouth of the Ohio River north to the Missouri Basin and the Milk River in Montana (Pflieger 1980).

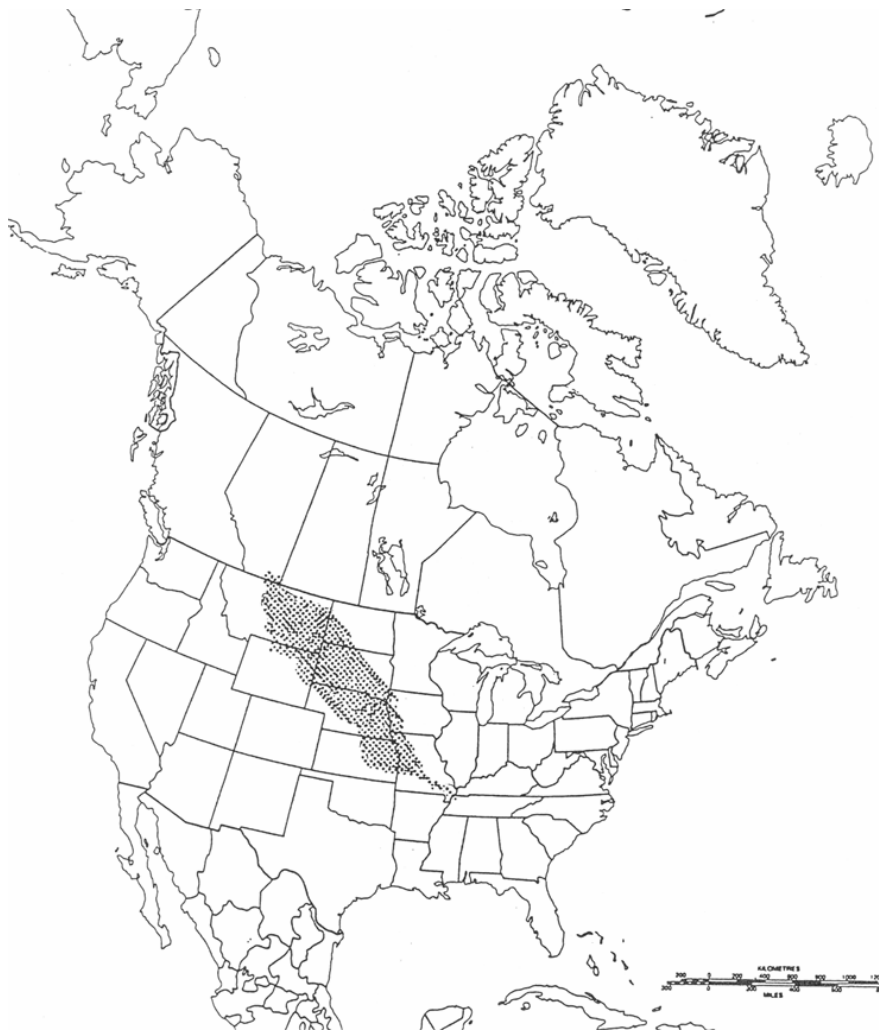


Figure 2. North American distribution of the western silvery minnow, *Hybognathus argyritis*, (after Scott and Crossman 1973; Pflieger 1980).

In Canada, the Western Silvery Minnow is found only in southern Alberta (Figure 3) where it is known from the South Saskatchewan River and seven sites on the Milk River [Pflieger 1980; Scott and Crossman 1973; ROM and UAMZ (University of Alberta Museum of Zoology, Edmonton, Alberta) Collections). It was first collected in Alberta from the Milk River in 1961 (UAMZ 5320), but the first published records were those of Willock (1968) also taken from the Milk River. Henderson and Peter (1969) also report on one specimen 93 mm S.L. taken from the South Saskatchewan River in 1963. They (Henderson and Peter 1969) suggested that the species had invaded the South Saskatchewan River from the Missouri system. No recent collections of the species have been made from the South Saskatchewan River (Nelson and Paetz 1992).



Figure 3. Canadian distribution of the Western Silvery Minnow, *Hybognathus Argyritis*.

PROTECTION

In the U.S. the species is considered of Special Concern in Wyoming (Johnson 1987).

In Canada the fish are not subject to any protected status and could not qualify for general protection under Habitat Sections of the Fisheries Act (not commercial species). General protection could be afforded if required under Alberta provincial wildlife legislation. The species is considered of special concern in Alberta (Johnson 1987).

POPULATION SIZES AND TRENDS

The species is known only from presence and absence data from one collection on the South Saskatchewan River and seven sites on the Milk River in southeastern Alberta. The species was first collected in Alberta from the Milk River in 1961 (UAMZ 5320) and subsequent collections between 1971 and 1976 verified its presence at a further six sites along the Milk River (UAMZ 2846, 3335, 3234, 3241, 3244, 3548.1, 3838.1). The number of specimens collected at each site varied from one to 26 and one site was visited in 1974 (UAMZ 3548.1) and again in 1976 (UAMZ 3838.1), 26 specimens were taken in 1974 and 2 in 1976, apparently it has not been looked for since. The only known record from the South Saskatchewan River is that reported by Henderson and Peter (1969) and it has not been found there since. Nelson and Paetz (1992) indicate the need for further specimens from the South Saskatchewan River before recognition of its establishment there.

There is no information available to establish population sizes or trends. The species appears to be native to the Alberta fauna and has, no doubt, been there for some time, previously going unnoticed or perhaps misidentified as the Brassy Minnow as it was first described as *Hybognathus argyritis* by C.P. Girard in 1856 from specimens collected from the Milk River in Montana (Nelson and Paetz 1992). Willock (1968) hypothesized that the species may have been more abundant in upper reaches of the Milk River prior to 1900. Increased turbidity resulting from channelling of irrigation water into the Milk River in the early 1900s may have caused a decline in the population numbers of the species in its Alberta range. The recovery of the river and its vegetation following cessation of this practice has permitted repopulation well into Alberta (Willock 1968).

Willock (1968) provided a hypothesis of the probable history of its occurrence in Alberta and in the Hudson Bay Watershed (South Saskatchewan River). Following deglaciation temporary links existed between the Hudson Bay and Missouri systems and movement in the Missouri system was not difficult. *Hybognathus argyritis* appears to have moved north from a Missouri Refugium (Crossman and McAllister 1985).

Willock (1968) attributed its loss from extensive areas in the U.S. to increased turbidity and the disappearance of aquatic vegetation and organic debris due to siltation. Apparently it is still abundant where found in the U.S. (Pflieger 1980).

HABITAT

There is very little information available on the habitat requirements of the species and none from Canada. Willock (1968) indicated that the ideal habitat of the species is probably quiet waters rich in phytoplankton as suggested by Trautman (1957) for the Silvery Minnows of Ohio. It is a plains species, usually found in the backwaters and pools of larger, northern plains streams (Pflieger 1980). Although sympatric with the Plains Minnow, *Hybognathus placitus*, in the Missouri basin, and the Central Silvery Minnow in the Mississippi basin (Figure 4), it occupies a different niche as the Plains Minnow occupies the open channels of the streams (Gilbert 1980) and can tolerate more turbid waters (Gilbert 1980; Hlohowskyj *et al.* 1989). The Central Silvery Minnow also occupies the backwaters and pools, but usually in smaller streams than those where the Western Silvery Minnow may be found (Pflieger 1980a,b), and is less tolerant of turbid conditions than either of the other two species (Hlohowskyj *et al.* 1989).

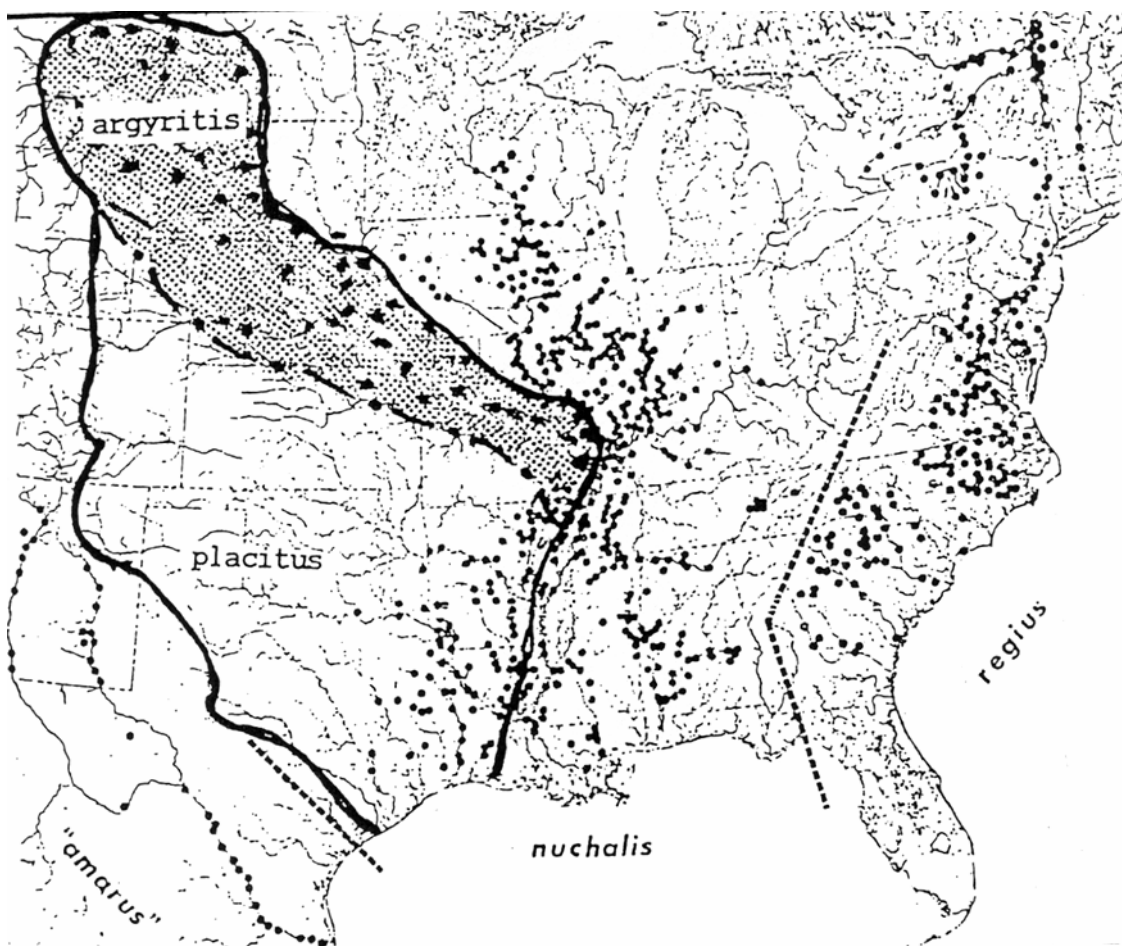


Figure 4. Approximate distributions of *Hybognathus argyritis*, *amarus*, *nuchalis*, *placitus* and *regius*. The solid line outlines the range of the Plains Minnow and the dashed line and shaded area are Western Silvery Minnow (modified from Gilbert 1980; Lee 1980; Pflieger 1980 a, b).

Trautman (1957) indicated that both the Western and Eastern Silvery Minnows were most abundant in areas of little or no current, where the waters are rich in phytoplankton and the gravelly, sand, muck or debris covered bottom are not covered by silt. He (Trautman 1957) also found that spawning only occurs where the rate of bottom siltation is low.

Like the Central and Eastern Silvery Minnows spawning probably occurs in heavily vegetated backwaters in slower moving reaches of the streams (Scott and Crossman 1973; Ramshaw and Mandrak 1995).

The young of the Eastern Silvery Minnow appear in small schools along the shore in the emergent vegetation about two weeks post-hatch (Raney 1939).

GENERAL BIOLOGY

General

The biology and ecology of this species have not been studied, but are probably similar to other species of *Hybognathus* (Pflieger 1980b). The following discussion is drawn from information on the Central and Eastern Silvery Minnows and the Plains Minnow after Scott and Crossman (1973), Gilbert (1980) Pflieger (1980a,b), and Ramshaw and Mandrak (1995).

Reproduction

Raney (1939) provided a detailed description of the reproductive biology of the Eastern Silvery Minnow from a study of populations in Cayuga Lake, New York. Spawning took place in about 0.3 m of water in late April and early May in heavily vegetated backwaters in slower moving reaches of the streams. Eddy and Underhill (1974) reported that *Hybognathus nuchalis* (= *argyritis*) spawns in May and June in Montana. The eggs were about 1 mm in diameter, non-adhesive and egg number varied with female size, varying from 2000 in a 60 mm female to 6600 in a 90 mm female. The eggs hatched in six to seven days with the water temperature varying between 13.3°C and 20.5°C. When propagated in ponds, the Eastern Silvery Minnow reached maturity and spawned at age two, and spawned again the following year (Raney 1942).

In Canadian waters, it is believed that the species spawns in May, although no observations have been published (Scott and Crossman 1973). The Central Silvery Minnow appears to have a similar reproductive biology (Forbes and Richardson (1920). Spawning in the Plains Minnow is protracted from April to August (Gilbert 1980) and there is evidence to suggest that the same may be the case for the Eastern Silvery Minnow (Scott and Crossman 1973).

Growth

Newly hatched larvae of the Eastern Silvery Minnow measured 6 mm T.L. and were 38 mm T.L. by July and about 51 mm by August. Females appear to spawn at one year of age at about 50 to 55 mm S.L., but males probably do not spawn until their second year (Raney 1939). Larval stages have been described and illustrated by Mansueti and Hardy (1967).

Species Movement

The Eastern Silvery Minnow migrates to spawning grounds in large schools. In Raney (1939) noted that this migration reached its peak in April in New York. Gascon and Leggett (1977) found large postspawning congregations of the Eastern Silvery Minnow in early summer in Quebec.

Diet

The diet of the Eastern Silvery Minnow consists of diatoms, algae, and bottom ooze (Raney 1939; Eddy and Underhill 1974). The Central Silvery Minnow apparently has a similar diet (Pflieger 1989a) as does the Plains Minnow and probably all species of *Hybognathus* (Gilbert 1980). The pharyngeal papillae found in all species of the Genus may be an accessory filtering system (to the gill arches) adapted for herbivory (Hlohowskyj *et al.* (1989).

Gascon and Leggett (1977) outlined the diet of the Eastern Silvery Minnow in Lac Memphrémagog, Quebec. The diet of 0+ fish changed from cladocerans (82% by volume), rotifers (8.4%) and chironomids (7%) to organic detritus (95%) and cladocerans (3%), as the average fork length (F.L.) increased from 32 mm to 44 mm. Individuals greater than 40 mm F.L. fed almost exclusively on organic detritus, except in June when 46% of their diet was cladocerans.

Parasites

Three species of trematodes, one protozoan, and the larval form of the cestode, *Ligula intestinalis*, have been listed as parasites of silvery minnows in North America (Hoffman 1967).

LIMITING FACTORS

Hybognathus nuchalis is sensitive to turbidity and siltation (McAllister and Coad 1974) which are likely causes of population declines in Missouri and Ohio (Pflieger 1971, Trautman 1957). Hlohowskyj *et al.* (1989) suggested that the finer, densely crowded pharyngeal papillae of the Central Silvery Minnow may be related to this. The Rio Grande Silvery Minnow, *Hybognathus amarus*, (restricted to the Rio Grande drainage) and the Plains Minnow, [sympatric with the Central Silvery Minnow in the

Mississippi basin (Figure 3)] are often found in turbid habitats. These species have shorter, less crowded papillae and appear to be well-adapted to silty environments (Hlohowskyj *et al.* 1989).

The Western and Eastern Silvery minnows possess pharyngeal papillae intermediate to those in *Hybognathus nuchalis*, and the Rio Grande and Plains minnows (Hlohowskyj *et al.* 1989), and are thought to be less sensitive to turbidity and siltation than the Central Silvery Minnow. Massé and Mongeau (1976), for example, relate a decrease in abundance of *Hybognathus regius* (and other fishes) to increased turbidity and siltation resulting from ship-induced wave action in the St. Lawrence River at Montreal. The Western Silvery Minnow and the Plains Minnow usually occupy different habitats, the former being found in backwaters and pools of larger plains streams (Pflieger 1980), and the latter in open, shallow river channels (Gilbert 1980).

Trautman (1957) indicated that both the Western and Eastern Silvery Minnows were intolerant of silt and turbidity and felt that increased turbidity was responsible for the extirpation of the Eastern Silvery Minnow in Ohio.

The Milk River flows through short grass prairie habitat which is subject to continuous erosion producing a high rate of silt deposition. Activity such as channelling or overgrazing could increase the already high rate of siltation and lead to extirpation of the species from its Canadian range (Willock 1968).

SPECIAL SIGNIFICANCE OF THE SPECIES

The Western Silvery Minnow is probably an important forage species where abundant, but in the northern parts of the range it may be too rare to be of significance. In the U.S. it may have some value as a bait fish (Eddy and Underhill 1974), but in Canada it is not commonly used as a bait fish as it does not survive well in a bucket (Scott and Crossman 1973).

The recent appearance in Canada and its distribution and habitat requirements are of interest to science in relation to the zoogeographic history and distribution of species subsequent to the Wisconsin Period of glaciation.

EVALUATION

The Western Silvery Minnow has a very limited Canadian range and distribution and is considered a species of special concern in Alberta. It appears that the species may be less sensitive to siltation and turbidity than the Central Silvery Minnow, but like the Eastern Silvery minnow probably requires clear, weedy habitat free of turbidity, pollution or habitat degradation. The species has obviously been in Alberta for some time, and has been overlooked, or perhaps misidentified as the Brassy Minnow until recently. It may be that the species has a refuge here, but industrial, urban and

agricultural activity may result in habitat degradation as has occurred for so many species with similar habitat requirements in the northern U.S. Given the restricted range and apparent rarity of the Western Silvery Minnow in Canada the species should be considered as Vulnerable.

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THE AUTHOR

Jim Houston has been the Environmental Advisor of the Canadian Section of the International Joint Commission (IJC) since June, 1986. Before coming to the IJC, Mr. Houston worked with the Department of Fisheries in Ottawa and Burlington from 1982 to 1986 where he served in a number of capacities, including assessing northern and inland fisheries.

After receiving his B.Sc. in Marine Biology from the University of Guelph, Ontario, Mr. Houston consulted on a number of projects for the Department of Fisheries and Oceans and World Wildlife Fund Canada. He has authored or co-authored over a dozen papers on the status of fish and marine mammals in Canada. Recently, he became a fellow member in an international group which has demonstrated skills for leadership in environment and development.

COSEWIC Status Report

Addendum

on the

Western Silvery Minnow

Hybognathus argyritis

2001

ADDENDUM. 2001 Addendum to the 1997 Status Report on the Western Silvery Minnow

Alberta, Environment, Fisheries and Wildlife Management Division initiated studies to assess the distribution and relative abundance of "Species at Risk" in accordance with the National Accord for the Protection of "Species at Risk". Three fish species of concern were identified in the St Mary and Milk river drainages, one of these being the western silvery minnow, *Hybognathus argyritis*. Summer and fall collection programs were conducted in August (10 sites on the Milk River, six on the St Mary River and four on Lee Creek; and October (18 sites on the Milk river and two on the St. Mary River) 2000. Only two specimens were taken from the Milk River (0.1 % of species composition). Apparently a concomitant US study on the Milk River between the International Border to the Fresno Reservoir in Montana found that the western silvery minnow constituted 5.86 % of species composition in that section of the river (RL&L 2001a).

In the 2000 study (RL&L 2001) the species was collected at only one of the 18 sites sampled in the lower Milk River. The site where the fish were found was close to sites where it had previously been captured (Willock 1969; Clayton and Ash 1980; RL&L 1987), but it was not found at other sites where it had previously been collected on the Milk River. Water levels were extremely low and the Lost River (a tributary to the Milk River) was dry, but this is a small intermittent stream and not always available as habitat.

Twenty sites were sampled on the Milk River between 18 and 24 October 2001 and 27 western silvery minnows were taken from the lowermost sections of the river with a CPUE of 1.97 fish/100m² (RL&L 2001b). Water levels were extremely low due to drought and draw down for irrigation and urban supply (Figure 1) and the fish were concentrated in the remaining pools.

The record of a specimen from the South Saskatchewan River (Henderson and Peter 1969) is spurious and still needs to be verified.

Western silvery minnow are usually captured only in mainstream areas of the river with low siltation (Willock 1969). Overwintering may be limited in some years by low water, but is probably possible in the lower reaches of the river (RL&L 1987) as long as water levels are sufficiently high. Suitable feeding and rearing habitat also seems to be available in lower sections of the river, yet few western silvery minnows have been collected (RL&L 2001a). Other factors such as low winter water flows, high suspended sediment levels, high siltation, low winter dissolved oxygen and limited availability of refugia are probably the limiting factors.

TECHNICAL SUMMARY INFORMATION

November 2001

DISTRIBUTION

Extent of occurrence:

AB

< 500 km²

Area of occupancy:

< 100 km²

POPULATION INFORMATION

Total number of individuals in the Canadian population:

Unknown, but not relatively abundant

Number of mature individuals in Canada (N):

Unknown

Generation time:

2 years

Population trend:

Unknown

Rate of population decline:

Number of sub-populations:

2

Is the population fragmented?

Yes

number of individuals in each sub-population :

Not known

number of extant sites:

2

number of historic sites from which species has been extirpated:

Does the species undergo fluctuations?

Fluctuations in?

RESCUE POTENTIAL

Does species exist outside Canada?

YES

Is immigration known or possible?

Possible from populations in MT

Would immigrants survive in Canada?

YES

Is suitable habitat available for immigrants?

YES - but range extensions are limited by water quality and habitat availability

THREATS

Increased siltation from channeling and/or overgrazing and fluctuation in water levels due to impoundments and water draw down for irrigation and urban use. Periods of drought reduce the river to a trickle and siltation has all but eliminated channels from the river bed. If water levels are not sufficiently restored over the winter months there is the possibility of many or all fish being lost due to oxygen deprivation.

EXISTING STATUS

Nature Conservancy Ranks: Global - G4; National: US - N4 , Canada - N3N4; Regional: IL - S2, IA - S1, KS - S2, MO - S2, MN - S4S5, NE - S5, ND - S?, SD - S5, WY - S2, AB - S1

Prior COSEWIC designation - Vulnerable 1997

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