

*Prunus virginiana* L. were common to both sites. *Thuja occidentalis* L., *Picea glauca* (Moench) Voss., *Betula papyrifera* Marsh., *Populus tremuloides* Michx., *P. balsamifera* L. and *Salix serissima* (Bailey) Fern. were associated with black ash in the Birds Hill site. *Tilia americana* L., *Symphoricarpos occidentalis* Hook., *Corylus americana* Walt., *C. cornuta* Marsh., *Viburnum rafinesquianum* Schultes, *Rosa woodsii* Lindl. and *Parthenocissus inserta* (Kerner) K. Fritsch, were associated with black ash in the Portage la Prairie site. Although a number of species are common to both sites, two predominantly boreal species *Picea glauca* and *Thuja occidentalis* are not native to the Portage la Prairie area. *Tilia americana*, common to the Grasslands Region of Manitoba, was not found in the Birds Hill area. The remaining species differences also indicate the affinity of the Portage la Prairie area to the Grasslands Region in which it was placed by Rowe (1959).

The origin of black ash in the Portage la Prairie area is speculative. This area was subject to glaciation and subsequent flooding from glacial Lake Agassiz which appears to rule out relic stands. This population could be a post glacial extension from existing eastern populations or from a western retreat which has since disappeared.

The fact that black ash is growing and reproducing in the Grasslands region is significant. In a number of Portage la Prairie stands, black ash was the dominant tree competing with *Fraxinus pennsylvanica*, *Tilia americana* and *Ulmus americana*. This indicates that this species can adapt to drier sites. Up to the present, black ash has been recommended only for moist sites but the present study indicates that some other factor may control its distribution. Studies by the author have shown that black ash has a complex seed dormancy overcome by a moist warm stratification followed by a moist cool stratification (unpublished results). Periodic spring flooding, such as occurs along the Assiniboine River, may help in breaking seed dormancy or in establishment of seedlings. Once established, black ash appears well adapted to the Grassland Region.

These native stands in the Portage la Prairie area represent the most westerly North American site reported for black ash. This site appears to have the most promise as a source of strains adapted throughout the prairie provinces.

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## The White Mullet, *Mugil curema*, Added to and the Striped Mullet, *M. cephalus*, Deleted from the Canadian Atlantic Fish Fauna

The genus *Mugil* has been reported twice for the Atlantic coast of Canada in the inshore waters of Nova Scotia, once by Vladykov in 1935 (and by subsequent authors such as Leim and Scott, 1966, who have repeated his record) and once by Gilhen (1969). The material was identified in both papers as the striped mullet, *Mugil cephalus* Linnaeus. Study of these and additional specimens (excepting Vladykov's which could not be located) showed that all extant material should be identified as the white mullet, *Mugil curema* Valenciennes (Figure 1). This paper extends the known range of *M. curema* northward and provides the first published record for Canada. *M. cephalus* is deleted from the Canadian ichthyofauna.

Two unpublished mullet collections in the ichthyology collection of the National Museum of Natural Sciences, Ottawa, taken from Nova Scotia waters (see Table I), were identified in 1962 by the curator, Dr. Don E. McAllister, as *Mugil curema*. McAllister's identification, confirmed by the present study, was based mainly on anal fin ray counts of III 9, a characteristic of *M. curema*. The anal fin ray count for *M. cephalus* is III 8.

The author examined 30 samples of preserved juvenile mullets (27 samples in the Nova Scotia



TABLE 1. — Collections of the White Mullet, *Mugil curema* from inshore Nova Scotia waters.

Location of specimens	Catalogue No.	Date Collected	Locality (General)	No. of specimens
National Museum of Natural Sciences, Ottawa	NMC62-52	September 17, 1917	Jeddore Harbour, Halifax County	1
Place of deposit unknown	—	September 29, 1931	Bedford Basin, Halifax County	1
National Museum of Natural Sciences, Ottawa	NMC62-64	September 14, 1961	Chester Basin Lunenburg County	3
Nova Scotia Museum, Halifax	966-Z-4-1(2)	September 1, 1966	Prospect Bay, Halifax County	2
St. Mary's University, Halifax	407-1(4)	September 1, 1966	Prospect Bay, Halifax County	4
Nova Scotia Museum, Halifax	966-Z-12-1(4)	September 6, 1966	Prospect Bay, Halifax County	2
Royal Ontario Museum, Toronto (out of the preceding collection)	25177	September 6, 1966	Prospect Bay, Halifax County	2
Nova Scotia Museum, Halifax	966-Z-5-1(57)	September 10, 1966	Prospect Bay, Halifax County	57
St. Mary's University, Halifax	407-2(49)	September 10, 1966	Prospect Bay, Halifax County	49
Nova Scotia Museum, Halifax	968-Z-61-1(7)	September 24, 1968	Prospect Bay, Halifax County	7
Nova Scotia Museum, Halifax	968-Z-61-2(11)	September 29, 1968	Prospect Bay, Halifax County	11
Nova Scotia Museum, Halifax	968-Z-61-3(2)	October 1, 1968	Prospect Bay, Halifax County	2
Nova Scotia Museum, Halifax	968-Z-61-4(16)	October 8, 1968	Prospect Bay, Halifax County	16
Nova Scotia Museum, Halifax	968-Z-61-5(10)	October 12, 1968	Prospect Bay, Halifax County	10
Nova Scotia Museum, Halifax	968-Z-61-6(2)	October 17, 1968	Prospect Bay, Halifax County	2
Nova Scotia Museum, Halifax	968-Z-61-7(14)	October 22, 1968	Prospect Bay, Halifax County	14
Nova Scotia Museum, Halifax	968-Z-61-8(14)	October 28, 1968	Prospect Bay, Halifax County	14
Nova Scotia Museum, Halifax	968-Z-61-9(1)	October 29, 1968	Prospect Bay, Halifax County	1
Nova Scotia Museum, Halifax	968-Z-7-1(2)	August 24, 1969	Prospect Bay, Halifax County	2
Nova Scotia Museum, Halifax	968-Z-17-1(11)	September 4, 1969	Prospect Bay, Halifax County	11
Nova Scotia Museum, Halifax	968-Z-18-2(2)	September 10, 1969	Prospect Bay, Halifax County	2
Nova Scotia Museum, Halifax	968-Z-24-1(8)	September 10, 1969	Prospect Bay, Halifax County	8
Nova Scotia Museum, Halifax	968-Z-19-1(10)	September 16, 1969	Prospect Bay, Halifax County	10
Nova Scotia Museum, Halifax	968-Z-20-1(13)	September 22, 1969	Prospect Bay, Halifax County	13
Nova Scotia Museum, Halifax	969-Z-21-1(16)	September 30, 1969	Prospect Bay, Halifax County	16
Nova Scotia Museum, Halifax	969-Z-22-1(15)	October 6, 1969	Prospect Bay, Halifax County	15
Nova Scotia Museum, Halifax	970-Z-158-1(10)	August 10, 1970	Prospect Bay, Halifax County	8
Nova Scotia Museum, Halifax	970-Z-166-1(8)	August 14, 1970	Prospect Bay, Halifax County	8
Nova Scotia Museum, Halifax	970-Z-184-1(5)	September 16, 1970	Prospect Bay, Halifax County	5
Nova Scotia Museum, Halifax	970-Z-193-1(1)	September 23, 1970	Prospect Bay, Halifax County	1
Nova Scotia Museum, Halifax	970-Z-186-1(8)	September 17, 1970	Prospect Bay, Halifax County	8
Nova Scotia Museum, Halifax	970-Z-199-1(5)	October 8, 1970	Prospect Bay, Halifax County	5
Nova Scotia Museum, Halifax	970-Z-405-1(2)	October 14, 1970	Prospect Bay, Halifax County	2



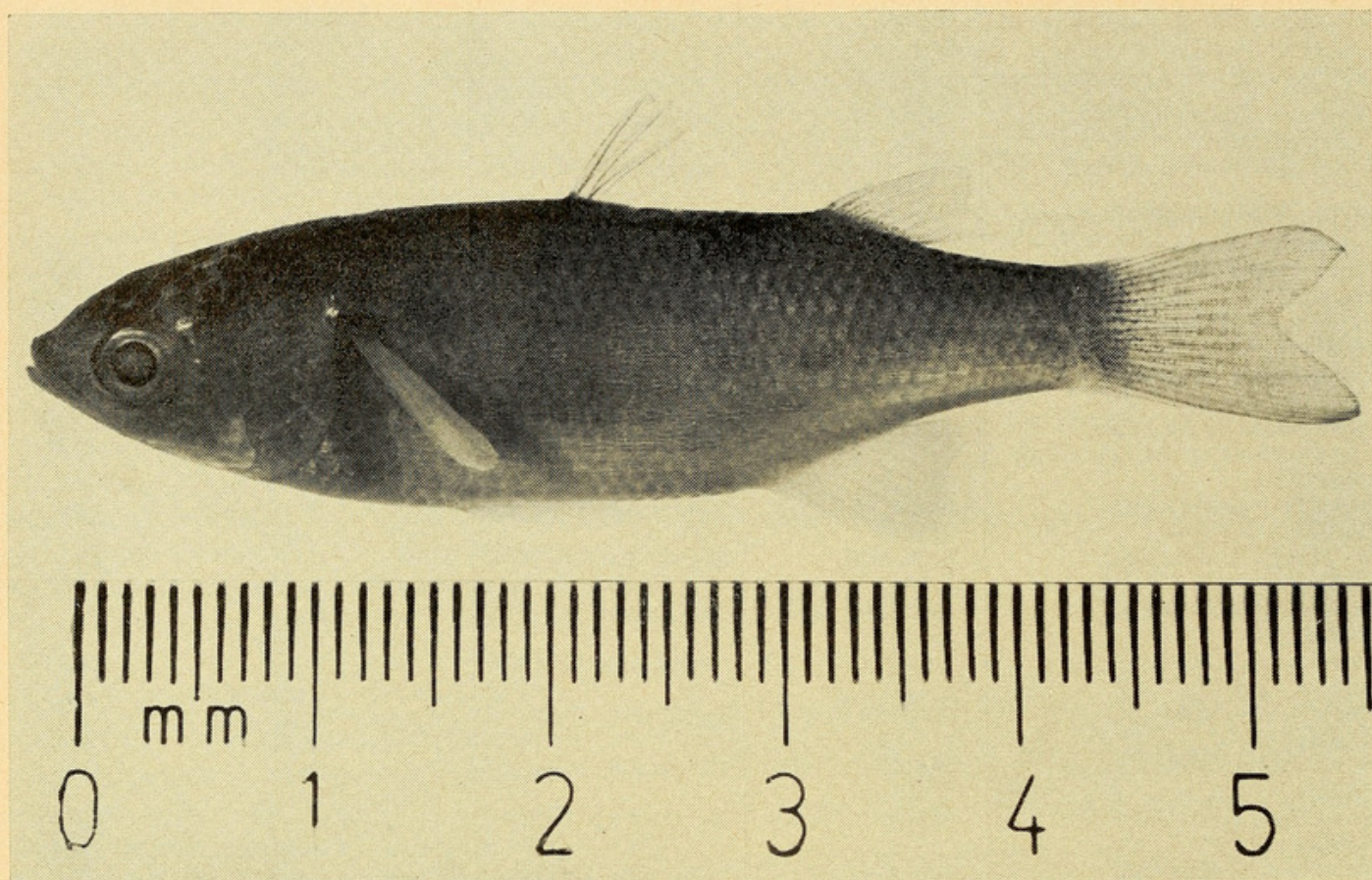


FIGURE 1. Juvenile White Mullet, *Mugil curema* from Prospect Bay, Halifax County, Nova Scotia.

Museum Fish Collection, two in St. Mary's University, and one in the Royal Ontario Museum) taken from Prospect Bay, Halifax County, and found the anal fin ray count also to be III 9. A total of six specimens from two of the Prospect samples (catalogue numbers 968-Z-61-7(14) and 970-Z-199-1(15) were sent to the Marine Research Laboratory, State of Florida Department of Natural Resources, where Kenneth R. Halscott confirmed the identification of the Nova Scotia Museum specimens as *M. curema*. Halscott's identification was based primarily on anal fin ray and body scale counts, plus characteristics documented by Anderson (1957 a and b).

A mullet 77 millimeters in total length, determined as *M. cephalus*, taken in Bedford Basin, Halifax County, in 1931 (Vladykov, 1935) is missing. However, the author believes that this specimen may also have been misidentified. All 311 specimens from the 32 extant collections of *Mugil* from Nova Scotia examined in this study have been *M. curema*. Vladykov's record is probably a misidentification and is tentatively tabled as the second collection of *M. curema* from inshore

Nova Scotia waters. *M. cephalus* is deleted from the Canadian ichthyofauna until a verifiable specimen is found. Bigelow and Schroeder (1953) report only *M. cephalus* from the adjacent waters of the Gulf of Maine; the possibility of their records being *M. curema* should be examined.

All Canadian records to date of *M. curema* are juveniles ranging from 28.5 to 77 millimeters in total length and were taken in inshore Nova Scotia waters, between Halifax and Lunenburg Counties.

The author gratefully acknowledges the advice and encouragement received from Dr. Don E. McAllister, Curator of Fishes, National Museum of Natural Sciences, Ottawa, during the course of this investigation and to Kenneth R. Halscott, Marine Research Laboratory, State of Florida Department of Natural Resources for identification services and a gift of juvenile *M. cephalus* and *M. curema*. Thanks are also expressed to Dr. Alfonso Rojo, Associate Professor of Ichthyology, St. Mary's University, Halifax, Dr. W. B. Scott, Curator of Ichthyology, Royal Ontario Museum, Toronto, for the loan of specimens, and Dr. Vic-



tor G. Springer, Division of Fishes, U.S. National Museum, Washington. The photograph (Figure I) was taken by Ronald Merrick of the Nova Scotia Museum.

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Notes on Home Range and Social Behavior in Adult Richardson's Ground Squirrels (*Spermophilus richardsonii*)

**Abstract.** The home range, movements, and aspects of the social behavior of adult *Spermophilus richardsonii* were observed during the summer of 1967 at Riding Mountain National Park, Manitoba. The amount of daily activity increased toward early June and became shorter toward mid July as hibernation

approached. Daily activity was bimodal during June, with the least activity at noon. Home burrows tended to be acentric in the home ranges. Boundries of home ranges were not clearly delineated. Squirrels tend to remain near the center of the home range in the first part of May, wander farther afield until mid June, and then spend more time in their home range centers as hibernation approaches. Squirrels initiating agonistic behavior did so from points in their home ranges highly frequented by them, whereas squirrels that were chased were in areas seldom frequented by them.

Field observations on a colony of Richardson's ground squirrels, *Spermophilus richardsonii richardsonii*, were made in 1967 during 5-29 May, 8 June-3 August, and 22 August-1 September. The study area was located in a forest clearing in the Baldy Lake Warden District, Riding Mountain National Park, Manitoba. A description of the area appeared elsewhere (Michener, 1969). Squirrels were trapped by setting National Live traps around the entrances to the most frequently used burrows. They were sexed and fitted with numbered steel ear tags, one in each ear, for permanent identification. Each squirrel was given a unique mark with Nyanzol A black fur dye (Nyanza Inc.) so that any individual could be identified from a distance. Dye marks were replaced when they faded or were lost during molting. The area was divided into a 100 foot grid, and field records of the locations and activities of the ground squirrels were kept from the time that they emerged from their burrows in the morning until they retired.

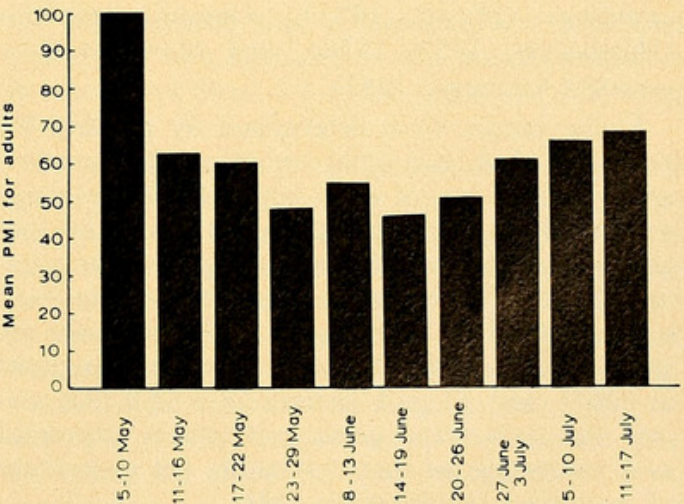


FIGURE 1. Home range usage expressed as the average PMI of grid sections visited by adult *S. richardsonii* on the study area.





Gilhen, John. 1972. "The White Mullet, *Mugil curema*, Added to and the Striped Mullet, *M. cephalus*, Deleted from the Canadian Atlantic Fish Fauna." *The Canadian field-naturalist* 86(1), 74–77. <https://doi.org/10.5962/p.343522>.

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