

- Peterson, R. O.** 1990. Wolves as interspecific competitors in canid ecology. Pages 315–323 in Ecology and conservation of wolves in a changing world. Edited by L. N. Carbyn, S. H. Fritts, and D. R. Seip. Canadian Circumpolar Institute, Occasional Publication Number 35.
- Rogers L. L., and L. D. Mech.** 1981. Interactions of wolves and black bears in northeastern Minnesota. *Journal of Mammalogy* 62: 424–436.
- Route, W. T., and R. O. Peterson.** 1991. An incident of wolf, *Canis lupus*, predation on a River Otter, *Lutra canadensis*, in Minnesota. *Canadian Field-Naturalist* 105: 567–568.
- Stenlund, M. H.** 1955. A field study of the timber wolf (*Canis lupus*) on the Superior National Forest, Minnesota. Minnesota Department of Conservation, Technical Bulletin Number. 4.

Received 1 August 2000

Accepted 25 March 2002

Meek's Halfbeak, *Hyporhamphus meeki*, and Flying Gurnard, *Dactylopterus volitans*, captured in the Annapolis Basin, Nova Scotia

A. JAMIE F. GIBSON¹ and RANSOM A. MYERS²

¹Acadia Centre for Estuarine Research, P.O. Box 115, Acadia University, Wolfville, Nova Scotia B0P 1X0 Canada; e-mail: jamie.gibson@acadiau.ca [Author to whom correspondence should be addressed]

²Department of Biology, Dalhousie University, Halifax, Nova Scotia B3H 3J5 Canada; e-mail: myers@mscs.dal.ca

Gibson, A. Jamie F., and Ransom A. Myers. 2002. Meek's Halfbeak, *Hyporhamphus meeki*, and Flying Gurnard *Dactylopterus volitans*, captured in the Annapolis Basin, Nova Scotia. *Canadian Field-Naturalist* 116(1): 134–135.

We report the capture of several unusual fish at a hydroelectric generating station, Annapolis Royal, in the Annapolis Basin, Nova Scotia, during the fall of 1999. These include a Meek's Halfbeak, *Hyporhamphus meeki*, that is either the first or second Canadian record for this species and a Flying Gurnard, *Dactylopterus volitans*, that is a first record for the Bay of Fundy. Additionally, three Bluefish, *Pomatomus saltatrix*, and a Fourbeard Rockling, *Enchelyopus cimbrius*, were reported for the first time from the Annapolis Estuary during 1999.

Key Words: Meek's Halfbeak, *Hyporhamphus meeki*, Flying Gurnard, *Dactylopterus volitans*, Bluefish, *Pomatomus saltatrix*, Fourbeard Rockling, *Enchelyopus cimbrius*, Annapolis River, Bay of Fundy, Nova Scotia, distribution.

The Annapolis Basin in Nova Scotia is home to the western hemisphere's only tidal hydroelectric generating station, located in Annapolis Royal (44° 45'N, 65° 31'W). As such, fish assemblages within the estuary are well studied, during both pre-operational stock assessments and surveys (e.g., Melvin et al. 1985; Jessop 1976), and several assessments of fish passage facilities at the generating station (e.g., Gibson 1996). During 1999, several unusual fish specimens were captured while testing the effectiveness of an ultrasound fish diversion system at the station (Gibson and Myers 2000). A Meek's Halfbeak, *Hyporhamphus meeki*, captured on 23 September, 1999, is either the first or second record of this species in Canada, and is the first record in 50 years. A Flying Gurnard, *Dactylopterus volitans*, captured 23 September 1999, is a first record for the Bay of Fundy. Other unusual specimens captured at this location during September 1999 include three Bluefish, *Pomatomus saltatrix* and one Fourbeard Rockling, *Enchelyopus cimbrius*. While these latter species occur regularly in the Bay of Fundy (Scott and Scott 1988), these species have not been reported previously in the Annapolis Estuary.

Hyporhamphus spp. are planktivorous fish characterized by a very long lower jaw and short upper jaw. The taxonomic status of western Atlantic *Hyporhamphus* was clarified by the description of a new species, *Hyporhamphus meeki*, by Banford and Collette (1993). This species ranges north from the Gulf of Mexico, and is a rare stray into the Gulf of Maine. It usually can be distinguished from its southern relative, *Hyporhamphus unifasciatus*, by having a greater number of total gill rakers on the first (31 to 40) and second arches (20 to 30), and having a ratio of preorbital length to orbit diameter greater than 0.70 (Banford and Collette 1993). Contreras-Balderas et al. (1997) suggest the species can be distinguished using the shape of the lateral band. The specimen reported herein is unusual in having 29 gill rakers on right first arch and 23 gill rakers on the right second arch, both of which are low for this species. The identifying characteristic for this specimen is the ratio of preorbital length to orbit diameter, which equals to 0.74 (Bruce Collette, personal communication).

One previous record of *Hyporhamphus* sp. exists for eastern Canada. This specimen, reported as *Hyporhamphus unifasciatus*, was captured in a

herring weir at Chamecock, New Brunswick, on 30 September, 1949 (Leim and Day 1959). Its location suggests that this specimen may actually have been a *H. meeki*, a species that was not described at the time that this specimen was captured.

Dactylopterus volitans is a benthic species of fish that superficially resembles a searobin, and is typically found in tropical or warm temperature water. It ranges south to Argentina, and commonly is found as far north as North Carolina. The species occasionally strays north to Nova Scotia. Scott and Scott (1988) report four specimens from the Atlantic coast of Nova Scotia during the 1970s. The Nova Scotia Museum of Natural History has two records of *D. volitans* in Nova Scotia, both from the Atlantic Coast in 1990 (John Gilhen, personal communication). *D. volitans* have also been reported from the Grand Banks and Scotian Shelf (Lou VanGuelpen, personal communication).

Bluefish are regular summer visitors to the Bay of Fundy during warmer summers. The Fourbeard Rockling is a resident of the Bay of Fundy, and sometimes moves into embayments during summer and fall (Scott and Scott 1988). Water temperature was warmer and salinity was higher during early September in 1999 than during six previous years of sampling since 1985, perhaps leading to favourable conditions for these fish to move farther into the estuary.

The Meek's Halfbeak (reference number: ARC 0016423) and Flying Gurnard (reference number: ARC 0016422) are deposited at the Atlantic Reference Centre located at the Huntsman Marine Science Centre, St. Andrews, New Brunswick.

Acknowledgments

The authors express their thanks to John Gilhen (Nova Scotia Museum of Natural History, 1747 Summer Street, Halifax, Nova Scotia, B3H 3A6), Lou VanGuelpen (Atlantic Reference Centre, Huntsman Marine Science Centre, 1 Lower Campus Road, St. Andrews, New Brunswick, E5B 2L7), Donald F. McAlpine (New Brunswick Museum, 277 Douglas Avenue, Saint John, New Brunswick, E2K 1E5) for searching their collections for records of these species. Thanks are also extended to Bruce Collette (Systematics Laboratory, National Marine Fisheries Services, Smithsonian Institution,

Washington, DC, 20560) for assistance with the identification of the *H. meeki*.

Literature Cited

- Banford, H. M., and B. B. Collette.** 1993. *Hyporhamphus meeki*. A new species of halfbeak (Teleostei: Hemiramphidae) from the Atlantic and Gulf coasts of the United States. Proceedings of the Biological Society of Washington 106: 369–384.
- Contreras-Balderas, S., M. L. Lozano-Vilano, and M. E. Garcia Ramirez.** 1997. Distributional and ecological notes on the halfbeaks of eastern Gulf of Mexico, with a provisional key for their identification. Gulf Research Reports 9: 327–331.
- Gibson, A. J. F.** 1996. Distribution and seaward migration of young-of-the-year American Shad (*Alosa sapidissima*), Blueback Herring (*A. aestivalis*) and Alewives (*A. pseudoharengus*) in the Annapolis River Estuary. M. Sc. thesis. Acadia University, Wolfville, Nova Scotia. 96 pages.
- Gibson, A. J. F., and R. A. Myers.** 2000. Assessment of a high-frequency sound fish diversion system at the Annapolis Tidal Generating Station with notes about the survival of fish moving seaward at the Annapolis causeway. Acadia Centre for Estuarine Research Publication Number 55. Acadia University, Wolfville, Nova Scotia. 98 pages.
- Jessop, B. M.** 1976. Physical and Biological Survey of the Annapolis River, 1975. Data Record Series Number MAR/D-76-8. Fisheries and Marine Service, Department of the Environment. Halifax. 29 pages.
- Leim, A. H., and L. R. Day.** 1959. Records of uncommon and unusual fishes from eastern Canadian waters, 1950–1958. Journal of the Fisheries Research Board of Canada 16: 503–514.
- Melvin, G. D., M. J. Dadswell, and J. D. Martin.** 1985. Impact of Lowhead Hydroelectric Tidal Power Development on Fisheries I. A Pre-operation Study of the Spawning Population of American Shad *Alosa sapidissima* (Pisces: Clupeidae), in the Annapolis River, Nova Scotia, Canada. Canadian Technical Report of Fisheries and Aquatic Sciences Number 1340. St. Andrews, New Brunswick. 33 pages.
- Scott, W. B., and M. G. Scott.** 1988. Atlantic Fishes of Canada. Canadian Bulletin of Fisheries and Aquatic Sciences 219. 731 pages.

Received 5 June 2000

Accepted 19 February 2002