species of fish prey due to an extended period of fasting prior to stranding. We consider comparative frequencies of selected prey to be too biased to be useful in any ranking of prey items. Therefore, this technique of analyzing prey utilization should be considered only if the examination of feces or the stomach contents from seals that were healthy when collected are not possible options.

Acknowledgments

We wish to thank all those from the New England Aquarium, Marine Mammal Rescue and Release Program, who helped collect the stranded animals. Paul J. Boyle and Kevin D. Powers commented on previous drafts of this manuscript. Research was conducted with the New England Aquarium's Edgerton Research Laboratory. This study was funded by National Marine Fisheries Service/Northeast Fisheries Center, Contract No. NA-82-FA-00007.

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LAWRENCE A. SELZER

Manomet Bird Observatory, Manomet, MA 02345

GREG EARLY
PATRICIA M. FIORELLI

New England Aquarium, Boston, MA 02110

P. MICHAEL PAYNE

Manomet Bird Observatory, Manomet, MA 02345
Present address:
Boston University Marine Program, Woods Hole, MA 02345.

ROBERT PRESCOTT

Massachusetts Audubon Society,
South Wellfleet, MA 02663

SCAVENGER FEEDING BY SUBADULT STRIPED BASS, *MORONE SAXATILIS*, BELOW A LOW-HEAD HYDROELECTRIC DAM[1]

A spawning run of striped bass, *Morone saxatilis*, has not been found in the Connecticut River, but subadults from other rivers were reported in the lower 100 km of the river in the 1930's (Merriman

[1]Contribution No. 84 of the Massachusetts Cooperative Fishery Research Unit, which is supported by the U.S. Fish and Wildlife Service, Massachusetts Division of Fisheries and Wildlife, Massachusetts Division of Marine Fisheries, and the University of Massachusetts.

1941). Subadults enter the river in the spring and summer, often in enough abundance to support a sport fishery in Connecticut (Moss 1960). No striped bass were passed upstream in the two Holyoke Dam fish lifts located at river km 140 from the initial operation in 1955 until 1979, when 103 were lifted. Each year from 1980 to 1984, 110-510 striped bass have used the fish lifts (O'Leary 1985). In 1982, 83.5% of the fish were age II; 16.5% were age III; and none were sexually mature (Warner 1983).

Because the striped bass did not migrate into the river to spawn, they probably entered to feed. The food of striped bass has been extensively studied, but there is no published report about the food of young fish that gather below a hydroelectric dam. We studied the food of the striped bass that were lifted at Holyoke Dam in 1982.

Methods

The stomachs of fish were removed and frozen, and the contents were examined in the laboratory with a dissecting microscope. Stomach contents were classified as small forage fish, body parts of large fish (i.e., fish larger than the striped bass could eat whole), insects, plant material, and empty. Body parts were the scales, bones, flesh, and ovaries of adult alosids (i.e., American shad, *Alosa sapidissima*, and blueback herring, *A. aestivalis*), and pieces of adult sea lamprey, *Petromyzon marinus*. The body parts originated from the following sources: fish that were injured or killed while attempting to pass the dam or to use the fish lifts, American shad that were discarded below the dam by sport fishermen, or turbine-induced injuries or mortalities of fish that passed through the hydropower turbine at the dam (Bell and Kynard 1985).

When possible, small forage fish were identified to species and measured for total length. Insects were identified to order. We compared the frequency of occurrence of the four foods eaten by striped bass that were lifted early (25 May-14 June), when average daily passage of adult alosids in the lifts was about 28,000, with the foods eaten by striped bass that were lifted late (after 21 June), when the average daily lift of alosids was about 3,000.

Results and Discussion

We examined 78 stomachs of striped bass—65 (83%) contained food. Sixty-nine percent of the stomachs with food contained the body parts of large fish (Fig. 1a). Of the stomachs with the body parts of large fish, 93% contained the scales of adult alosids, with many containing over 20 scales; 16% contained the body parts of adult sea lampreys.

Small forage fish were second in the frequency of occurrence at 61%, and insects were third at 21% (Fig. 1a). Elvers of the American eel, *Anguilla rostrata*, (96 mm mean total length, range: 70-125 mm, $N = 24$) dominated the small forage fish category, occurring in 58% of the stomachs that contained forage fish. Elvers, migrating upstream from the ocean, may be delayed and concentrated by Holyoke Dam; perhaps striped bass follow the elvers upriver—both species occur in the fish lifts at the same time. Cyprinids were identified in six of the stomachs with forage fish. All had a 2,4-4,2 tooth formula and were probably spottail shiners, *Notropis hudsonius*, a commonly observed minnow. Insects in stomachs were mayfly nymphs, order Ephemeroptera, but only one or two mayflys were found in any stomach.

There was a significant difference in the frequency of the four food groups in fish collected early and late ($\chi^2 = 12.6$, $P < 0.01$). Fish parts dominated the stomach contents of early-lifted fish, whereas in late-lifted fish 54% contained parts of large fish, but 77% contained small forage fish (Fig. 1b). Fifteen percent of the stomachs of early-lifted fish were empty.

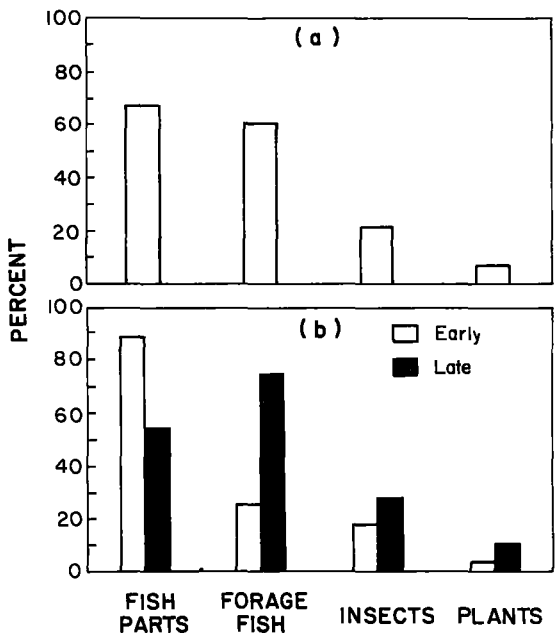

FIGURE 1.—Percent occurrence of the four major foods in the stomachs of striped bass passed by the Holyoke fish lifts a) in all of 1982 and b) in fish sampled early (25 May-14 June, $N = 39$) and late (after 21 June, $N = 26$) 1982.

and 19% of the stomachs of late-lifted fish were empty.

Food of the striped bass at Holyoke Dam was dominated by the body parts of adult American shad, blueback herring, and sea lamprey when many individuals of these species were being lifted, and dominated by forage fish and insects, when the alosids and sea lampreys were scarce (Fig. 1b). The reduced incidence of feeding on the body parts of large fish by striped bass lifted after 21 June was probably the result of a dramatic reduction in the availability of this food that occurred when the run of anadromous alosids diminished.

Hollis (1952) found alosid scales in the stomachs of adult striped bass captured below Conowingo Dam on the Susquehanna River in Maryland, but he dismissed these as accidental. In our study, alosid body parts occurred in stomachs too frequently to be accidental. Many authors consider the food that is selected by striped bass to be directly related to the availability (Hollis 1952; Thomas 1967; Schaefer 1970). During the run of anadromous fish at Holyoke Dam, the most abundant food that is available for striped bass is likely the body parts of dead or injured American shad, blueback herring, and sea lamprey, although we were not able to confirm this by sampling below the dam. About 900,000 adult alosids were passed upstream in the fish lifts in 1982, and injuries and mortalities were commonly observed at the dam and fish lifts. Subadult striped bass may typically concentrate below hydroelectric dams and feed on the parts of fish (anadromous or freshwater species) that die or sustain injury while attempting to move upstream or downstream of the dam.

Acknowledgments

This research was supported by Federal Aid Project AFS-4-R-21 and Dingell-Johnson Project 5-29328 to the Massachusetts Division of Fisheries and Wildlife and the Massachusetts Cooperative Fishery Research Unit.

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JOHN WARNER
BOYD KYNARD

Massachusetts Cooperative Fishery Research Unit
204 Holdsworth Hall
University of Massachusetts
Amherst, MA 01003

GENETIC CONFIRMATION OF SPECIFIC DISTINCTION OF ARROWTOOTH FLOUNDER, *ATHERESTHES STOMIAS*, AND KAMCHATKA FLOUNDER, *A. EVERMANNI*

The uncertain taxonomic status of two morphological types of *Atheresthes* (family Pleuronectidae) has led to some problems in fisheries surveys and stock assessments. Although data collection would be simplified if these types were conspecific morphs, a single classification would mask differences of distribution and abundance if each type actually represented a distinct species. Each type is described as a separate species: arrowtooth flounder, *A. stomias*, and Kamchatka flounder, *A. evermanni*, based on morphological differences in gill raker count, dorsal and anal fin rays, caudal vertebrae number, eye-dorsal fin distance, and relative position of the upper eye (Norman 1934; Wilimovsky et al. 1967). However, the differences are subtle, and both types have generally been considered *A. stomias* in fisheries surveys (e.g., Smith and Bakkala 1982).

Atheresthes stomias occurs in the eastern Bering Sea and eastern North Pacific Ocean from about St. Matthew Island, southward through the eastern Bering Sea and Gulf of Alaska, and along the North American coast to central California (Hart 1973). *Atheresthes evermanni* is distributed in the western