

OBJECTIVES:

1. To determine ammonia production by walleye in relation to fish size, diet, and temperature.

PROGRESS:

The student decided to terminate his graduate degree and seek employment. A completion report on the work accomplished from January 1, 1986 to October 29, 1986 was prepared by Summerfelt and White and transmitted to the Iowa Department of Natural Resources. The range in excretions rates for walleye (61.5 to 92.0 grams) were 4.51 to 31.55 mg/kg/hr at a temperature of 22 C. The rates varied in relation to time since last feeding and body weight. The excretion rate rises to a peak within 40-60 minutes after feeding and then declines to about two-thirds of the basal rate in about 70-80 minutes. The excretion rates observed for walleye are difficult to compare to published values for other species because of variation in experimental conditions within and among studies, but especially in the range in time since last feeding, diet, fish size, and water temperature.

FUTURE PLANS:

Another M.S. degree student, James A. Forsberg, has taken over the project and will commence studies on the project by May 1987. His degree plans suggest a project duration to August 1989. His long-term project goals are the same as before, that is to evaluate ammonia excretion by walleye of three size groups at two ranges of water temperature. Diet effects (nitrogen level in the diet) will be considered if time permits. Unfortunately, Iowa DNR funding is no longer available and a new source of support will have to be sought.

* **HOST SPECIFICITY AND LARVAL DEVELOPMENT OF THE ENDANGERED MUSSEL,
Lampsilis higginsii**

INVESTIGATOR: Diane R. Waller

MAJOR ADVISOR: Lawrence G. Mitchell

FUNDING: U. S. Fish and Wildlife Service and La Crosse National
Fishery Research Laboratory.

OBJECTIVES:

1. To provide a comprehensive review of the literature concerning the reproductive development, host specificity, and glochidial development of Lampsilis higginsii and closely related species of mussels.

2. To develop a method of distinguishing glochidia of L. higginsii from those of closely related species.
3. To develop in vitro culture capabilities using glochidia of L. ventricosa or another mussel closely related to L. higginsii.

PROGRESS:

*Larval identification work showed that Lampsilis higginsii larvae (glochidia) cannot be definitely distinguished from those of the related species, L. ventricosa, L. radiata siliquoidea, and Ligumia recta, except by using scanning electron microscopy.

Fifteen species of fish were tested for their suitability as hosts for the glochidia of L. higginsii. Juveniles were successfully transformed on nine of these 15 species including northern pike, bluegill, green sunfish, smallmouth bass, largemouth bass, walleye, yellow perch, white bass, and brook stickleback.

Efforts to culture the glochidia and juveniles of L. higginsii continued with limited success. Fifteen glochidia were successfully transformed to the juvenile stage without a fish host. An artificial media of fish blood, amino acids, vitamins, and antibiotics was used.

FUTURE PLANS: Continue laboratory research.

THE ECOLOGY OF NONGAME BIRDS NESTING IN ALFALFA AND OAT FIELDS

INVESTIGATOR: Brian J. Frawley

MAJOR ADVISORS: Robert B. Dahlgren and Louis B. Best

FUNDING: Iowa Department of Natural Resources

OBJECTIVES:

1. Determine the species and abundance of nongame birds nesting in alfalfa and oat fields.
2. Determine nesting success.
3. Evaluate nest-site selection.
4. Document territory dynamics and territory characteristics.
5. Evaluate the importance of oat fields as a source of secure nesting cover for renesting attempts.

6. Suggest plant species and methods of forage management for nongame birds.

PROGRESS:

Field work for the first season was completed in September. From September through December, data has been tabulated.

Dickcissel (Spiza americana), red-winged blackbird (Agelaius phoeniceus), grasshopper (Ammodramus savannarum) and vesper sparrow (Poocetes gramineus), common yellowthroat (Geothlypis trichas) meadowlark (Sturnella spp.) and sedge wren (Cistothorus platensis) were observed breeding in alfalfa fields. Study plots located in alfalfa fields were mowed for the first time between the dates of 2-17 June. Following this mowing, populations of dickcissel, red-winged blackbird, common yellowthroat and sedge wren disappeared. Of these species, only the dickcissel eventually returned to nest in alfalfa fields. However, dickcissel densities never reached pre-mow levels. Grasshopper and vesper sparrows utilized both mowed and unmowed fields. Both sparrows seemed to show a preference for less densely vegetated areas and were observed nesting in alfalfa fields immediately following mowing operations, despite being absent prior to the cutting.

Dickcissel, red-winged blackbird, grasshopper and vesper sparrow, horned lark (Eremophila alpestris) and common yellowthroat were observed breeding in oat fields. The majority of dickcissel and red-winged blackbird nests were located in the largest available forbs (e.g., Canadian thistle, dogbane, and milkweed). As noted for alfalfa fields, vesper and grasshopper sparrows apparently preferred the less densely vegetated areas. These sparrows used oat fields during the early and middle stages of oats development and were absent when harvest occurred (approx. 15 July). Common yellowthroat was also an opportunistic nesting species. It was largely confined to areas of very dense vegetation (e.g., waterways).

FUTURE PLANS:

Data analysis will continue and preparation for field work in 1987 will begin.

THE USE OF NOTCHED DIKES BY FISHES IN THE MISSOURI RIVER, IOWA

INVESTIGATORS: T. E. Robertson, C. H. Pennington, and J. S. Ramsey

FUNDING: U. S. Army Corps of Engineers

OBJECTIVES:

1. To characterize the physical habitats associated with modified and unmodified dikes in the middle Missouri River.