

350

Mississippi

River

Research

Consortium



Annual Meeting

1980

TWELFTH ANNUAL MEETING OF THE  
MISSISSIPPI RIVER RESEARCH CONSORTIUM

JUNE 6-7, 1980

LORAS COLLEGE  
DUBUQUE, IOWA

EDWARD T. CAWLEY, PH.D. - PRESIDENT

JOHN F. BAMRICK, PH.D. - SECRETARY

## SCHEDULE

### Thursday, June 5

4:00 - 6:00 p.m.

Registration, St. Joseph Hall  
of Science

### Friday, June 6

8:00 a.m. - 10:00 a.m.

Registration, St. Joseph Hall  
of Science

9:00 a.m. - 12:00 noon

Session I - Solicited papers  
Foley Auditorium

1:30 - 4:30 p.m.

Symposium - Planing the Future of  
the River.

### Saturday, June 7

7:30 a.m.

Breakfast

8:30 a.m.

Business Meeting

9:00 a.m. - 10:20 a.m.

Session II - Solicited papers  
Foley Auditorium

10:30 a.m. - 12:00 noon

Session III - Endangered Species  
State Reports,  
Science Hall,  
Foley Auditorium

12:00 noon

Adjourn

## SPEAKERS SCHEDULE

### Friday

- 9:00 Welcome
- 9:10 A Classification of Wing and Closing Dams on the Upper Mississippi River Bordering Iowa - Tom Boland
- 9:30 Fish Use of Wing and Closing Dams - John M. Pitlo, Jr.
- 9:50 Quad Cities Station Aquatic Monitoring Program, Pool 14 Mississippi River - Thomas Hiebert
- 10:10 Coffee Break
- 10:30 Effect of Elevated Temperature and Acidification of Macroinvertebrates in Outdoor Experimental Channels - John Arthur, James Zischke, Kathleen Nordlie
- 10:50 Pool 20: An Overview - R. V. Anderson, L. A. Jahn, J. D. Ives
- 11:10 Some Aspects of Succession on River Dredge Spoil - Joe Ives, Jon Howe
- 11:30 Lunch
- 1:30 -  
4:00 Symposium - Planning the Future of the River
- GREAT I Mike Vanderford  
U. S. Fish and Wildlife
- GREAT II Gerry Bade  
U. S. Fish and Wildlife
- GREAT III Joe Janusck  
U. S. Fish and Wildlife
- GREAT-UMRRC &  
Master Plan Jerry Rasmussen  
U. S. Fish and Wildlife

### Saturday

- 9:00 Quantitative Sampling of Mollusk Population in Rivers Using S.C.U.B.A. - Edward T. Cawley
- 9:20 The Historic and Present Distribution of the Endangered Naiad Mollusk Lampsilis Higginsii (Lea, 1857) - Marian E. Havlik
- 9:50 Coffee Break
- 10:10 Endangered Species Discussion

## ABSTRACTS OF PAPERS PRESENTED AT THE MEETING

### A CLASSIFICATION OF THE WING AND CLOSING DAMS ON THE UPPER MISSISSIPPI RIVER BORDERING IOWA

Author: Tom Boland

Iowa Conservation Commission

Wallace Building

Des Moines, Iowa 50319

Studies were initiated to inventory and classify the training structures along the Iowa bank of the Upper Mississippi River. A total of 595 wing and closing dams were inventoried. Physical data collected from each dam site included water depth and river bottom contour, current velocities, and substrate samples. Data indicated that 217 (36 percent) of the dams within the study area had been either completely eroded, covered with bottom sediments or completely removed. The remaining dams (373) were sorted into twelve definable groups based on their physical characteristics, hydraulic regime and effect of the structure on the surrounding area.

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TITLE: FISH USE OF WING AND CLOSING DAMS

AUTHOR: John M. Pitlo Jr.

Iowa Conservation Commission

Bellevue Research Station

Bellevue, Iowa 52031

ABSTRACT: The study is in the initial stages, with some preliminary sampling completed. Study objectives are to sample fish populations on wing and closing dams with different physical and hydraulic characteristics to determine which type of wing or closing dams are important to river fish populations. Additional objectives include development of a strategic plan to recommend that wing and closing dam reconstruction and modification is compatible with fisheries integrity.

QUAD CITIES STATION AQUATIC MONITORING PROGRAM, POOL 14  
MISSISSIPPI RIVER, Thomas I. Hiebert, Commonwealth Edison  
Company, Chicago, Illinois

Since 1971, Commonwealth Edison Company has been conducting biological studies at the Quad Cities Generating Station Units 1 and 2 (1600 MWe) located on Pool 14 of the Mississippi River. To date, the program includes one year of pre-operational and nine years of operational investigations. While earlier studies considered a much wider range of potential biological effects, more recent effort (1978 to present) have focused on the fish populations of Pool 14. Current studies include the accumulation of long-term data base on species composition and relative abundance in Pool 14, as well as studies to quantify important aspects of the population dynamics of a selected species, freshwater drum (Aplodinotus grunniens), as it might be affected by station operation.

Formulation of the 1980 program has been influenced by a review of the 1978 and 1979 study program results and by recommendations made from the Illinois Department of Conservation, the Iowa Conservation Commission and the Illinois Environment Protection Agency. The 1980 program will concentrate on ichthyoplankton monitoring in the river, adult and juvenile fish long-term monitoring impingement and the freshwater drum life history and population dynamics program. The presentation will encompass the 1980 study program and recent trends leading up to the program.

EFFECTS OF ELEVATED TEMPERATURE AND ACIDIFICATION ON MACROINVERTEBRATES IN OUT-  
DOOR EXPERIMENTAL CHANNELS

John W. Arthur, James A. Zischke, and Kathleen J. Nordlie  
U.S. Environmental Protection Agency  
Monticello Ecological Research Station  
Monticello, Minnesota 55362

Effects of elevated temperature and reduced pH on benthic macroinvertebrates were studied in outdoor experimental channels at the U.S. EPA Monticello (Minnesota) Ecological Research Station. The invertebrates in the channels were species most commonly found in lentic habitats.

From December 1976 to September 1977 one channel was maintained at ambient (Mississippi River) temperature and another at 10°C higher. Benthic densities were significantly higher in the heated channel in the winter and spring, but the highest densities observed were in the ambient channel during the summer. The reproductive period of Physa (snail) began approximately two months earlier and Asellus (isopod) three months earlier in the heated channel. The emergence of three chironomids, one ceratopogonid and one zygopteran were advanced from one to four weeks in the heated channel.

From May to September 1979 one channel was acidified, with sulfuric acid, to pH 6, another to pH 5 and a third, at pH 8, was used as a control. Throughout most of the study benthic densities were lowest at pH 5 and highest at pH 8. Populations of flatworms, leeches, and snails were reduced significantly at pH 5. The drift rates of most macroinvertebrates were initially stimulated at the lowest pH. Both total numbers and numbers of species of emerging insects declined with declining pH.

POOL 20: AN OVERVIEW. R. V. Anderson, L. A. Jahn, J. D. Ives. Dept. Biological Sciences, Western Illinois University, Macomb, IL 61455.

For the past 10 years the students and professors of WIU have been investigating various aspects of the Mississippi River on Pool 20. The investigations range from physical-chemical factors to fish life history studies. Weekly determinations, over a 1 year period, of water temperature, dissolved O<sub>2</sub>, current velocity, color, CO<sub>2</sub>, alkalinity and pH have been made. Periods of increased stream discharge were accompanied by increased current velocity, turbidity, CO<sub>2</sub> and decreased dissolved O<sub>2</sub> and plankton numbers. Fifty-one genera of plankton were found and density varied directly with O<sub>2</sub> but inversely with current and turbidity. Major riparian vegetation patterns show successional trends depending on topography and water inundation frequency. Benthic macroinvertebrate studies have shown a relationship between the river channel, substrate composition and community structure. Of 242 fish collected in 1977 and 1978, 65% were infected with one or more parasites. Fish hosts represented 29 species from 14 families and parasites included 38 species from 5 phyla. Of particular interest has been the age, growth, and feeding habits of the blue sucker in the pool. The primary purpose of this presentation is to indicate the availability of baseline data and the need for information and access to similar student based or unpublished research completed on the Mississippi River.

#### SOME ASPECTS OF SUCCESSION ON RIVER DREDGE SPOIL

Joseph D. Ives and Jon S. Howe; Department of Biological Sciences, Western Illinois University, Macomb, IL. 61455

The vegetation on 15 dredge disposal sites, located in pools 19 and 20, Upper Mississippi River, and ranging in age from zero to 28 years, were studied.

Three major types of spoils were found: sand deposited on existing woods, deposits forming new terrestrial habitat, and rock deposits forming new habitat. The lower elevation spoils on wooded areas supported thick growth of vines. In new terrestrial areas, moist sand deposits supported dense stands of sandbar willow (Salix interior Rowlee), while moist rock areas supported wetland herbs, with the density dependent on the amount of wave disturbance. Dry spoils on all sites supported sparse communities of cosmopolitan agricultural weeds.

Depth of spoil deposits in established wooded stands had some pronounced effects. Different vegetation strata were effected with maximum effects showing in areas covered by 4 meters or more.

Soil moisture was determined to be the most influential factor effecting succession. Topography and the presence of silt lens within the sand or rock had measureable effects on soil moisture. Spoil textural composition, with the exception of rock, and pH had little or no measurable effects.

QUANTITATIVE SAMPLING OF MOLLUSK POPULATION IN RIVERS USING S.C.U.  
B.A. Edward T. Cawley, Loras College, Dubuque, Iowa 52001

The majority of Mollusk surveys in the past have consisted of mass collections of a river using brailing and poly-wogging. The data is presented in the form of taxomic lists of short reaches of the river. Densities within a single bed, and species associations are difficult or impossible to determine.

A S.C.U.B.A. sampling technique using a belt transect 16 meters long and 0.5 meters wide is described. A sampling bag on a trolley permits maximum use of underwater time. Using these procedures abundance and intra bed diversity can be effectively described.

THE HISTORIC AND PRESENT DISTRIBUTION OF THE ENDANGERED NAIAD MOLLUSK LAMPSILIS HIGGINSI (LEA, 1857), HIGGINS' EYE. Marian E. Havlik, Malacological Consultants, La Crosse, WI 54601. A continuing search of literature and museum specimens shows that historically Lampsilis higginsii was rare but widely distributed from Mississippi R.M. 296, Busch, MO to R.M. 811, Prescott, WI. Since the early 1900's the northern end of the range has been reduced by at least 103 miles, and the southern end by 120 miles. The overall range in the Mississippi as of 1965 was decreased from 515 to 292 miles, a loss of 43%. Based on 1977 records, the range may have decreased even more to only 244 miles or a loss of 53%. Living specimens found since 1965 are widely scattered. Reproduction to assure continuation of the species is questionable even where populations are known to be established. Studies of animal middens should increase the knowledge of the range. Previously known from at least 10 major tributaries, L. higginsii appears to be restricted to a small population in the Wisconsin River and in the St. Croix River; it apparently has been extirpated from 262 miles of the Illinois River. Prime areas for critical habitat are at Sylvan Slough and Andalusia Slough in Illinois, and from the mouth of the Wisconsin River to Lansing, Iowa. Commercial clamming should be restricted in the East Channel at Prairie du Chien, WI; that Channel should also be protected from increased commercial navigation or other environmental impacts. L. higginsii is the only naiad species in the Mississippi that is not found elsewhere in the U.S. Similar specimens from Missouri and Arkansas are now believed to be a form of the Lampsilis orbiculata (Hildreth, 1828) complex.



