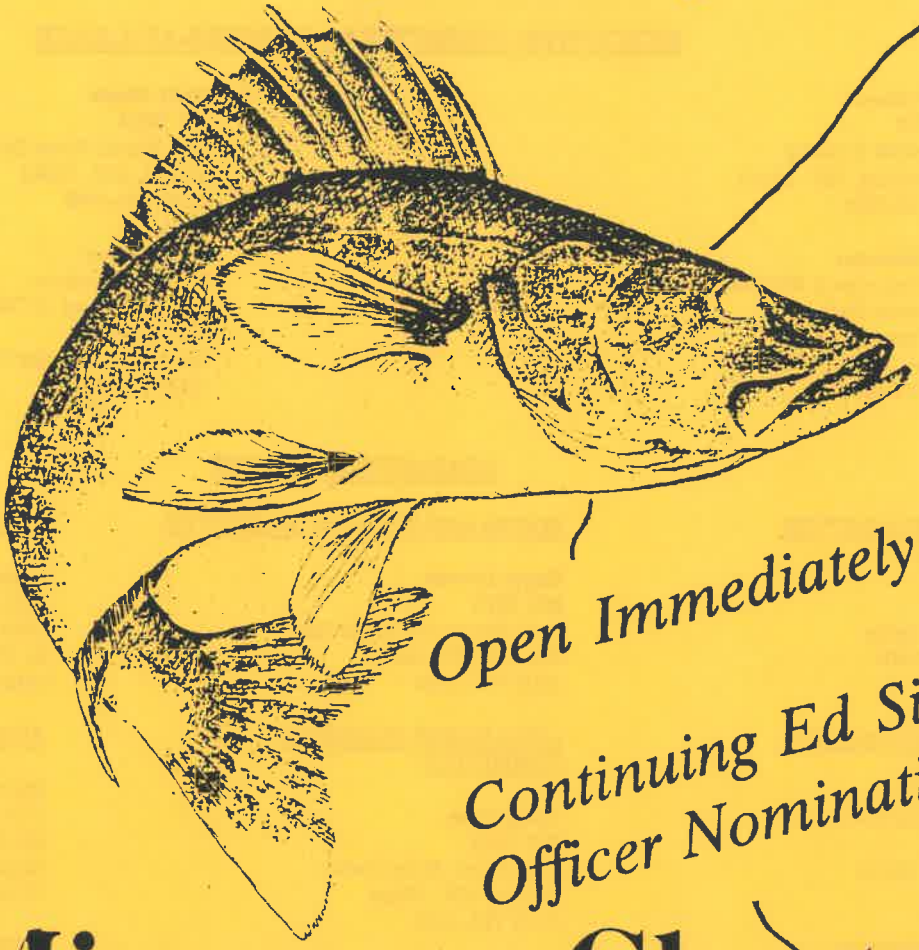
Special Issue: Exotics in Minnesota

American Fisheries Society



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Continuing Ed Signup
Officer Nominations Due

Minnesota Chapter

OCTOBER 1991

AFS

AMERICAN FISHERIES SOCIETY MINNESOTA CHAPTER OFFICERS 1991-92

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Minnesota Chapter
American Fisheries Society

Promotes the Conservation, Development and Wise Utilization of the Fisheries / Organized 1870 • Incorporated 1911

CONTENT **PAGE**

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CONTINUING EDUCATION WORKSHOP
Growth Assessment for Fisheries Research and Management: Theory and Application

by Dr. George Spangler, Minnesota Sea Grant College and Don Pereira, Minnesota DNR

This workshop will focus on applying general linear modelling for the assessment of fish growth. The primary software will be the interactive package by Dr. Sanford Weisberg, Dept. of Statistics, University of Minnesota. This system analyzes annular increment measurements of bony parts and conveniently handles data stored by the DISBCAL digitizing program. The initial version of Weisberg's model was distributed by Minnesota Sea Grant for PC computer systems. A more recent version runs primarily on Macintosh computers and work stations with the X11 window system. The substantial advantage of the new system is that it permits the inclusion of multiple years of data. Currently, a Microsoft Windows implementation of the computing environment for running Weisberg's model is being constructed. If this implementation is available soon, then workshop participants will have both PCs and Macintosh microcomputers available. We would also like to introduce Schnute's general fish growth model if enough time is available.

We would like to solicit suitable data sets from anyone interested in attending the workshop. Candidate data sets should include multiple years of data and preferably collected for testing a particular hypothesis. Prior to the workshop, we will conduct initial analyses on these data and then select suitable examples to work through during the workshop. If you are interested in providing data, please contact Don Pereira at 612/772-7962.

Tentative Workshop Schedule and Syllabus

I. Theory and background relevant to growth of fishes and linear models. We will cover this material during the first afternoon of the workshop. If enough time is remaining, we will introduce the computer software, including XLISP-Stat and Weisberg's model.

II. Analysis of case studies. We will begin the second day with the analysis of an example data set. Next, we will form working groups and each group will be responsible for analysis of a unique data set.

III. Discussion of case study analyses and review. We will discuss our results from the previous day's analyses and resolve problems that may have come up. If enough time is available, we will introduce and discuss potential applications of the Schnute growth model.

When: December 9th, 1991, 1:00 p.m. - December 11th, 12:00 p.m., 1991

Where: Concordia Language Villages, Bemidji, MN.

How many: 25 maximum

Cost: $55 - Instruction fee, text, AFS continuing education registration

$100 - Activities, meals & lodging at the language village

DNR EMPLOYEES NOTE: In past years, funding for AFS continuing education workshops has been provided by the central office. This funding is <u>not</u> available this year. You will need to contact your local supervisor (area, region, research biologist) to ascertain whether funds are available. The short time frame before registrations are due means you must act quickly.

ADVANCED REGISTRATION IS REQUIRED. Upon receipt of registration, you will be sent a packet with more detailed information and a reading list. Software and operating instructions for Weisberg's model will be provided at the workshop. Unfortunately space is limited, so the workshop will be filled on a first come first serve basis, so please register early.

GROWTH ASSESSMENT WORKSHOP REGISTRATION FORM

Please register me for the course "Growth Assessment: Theory and Application".

Name _____

Address _____

_____

Phone (Work)_____ (Home)_____

Organization _____

Growth workshop fee and text - $55 _____
Meals & lodging at the language village - $100 _____

Total cost _____

REGISTRATION DEADLINE IS NOVEMBER 25, 1991

Send registration form and payment (checks payable to MN-AFS) to:

Mark Cook, MN-AFS Continuing Education Chairman
Area Fisheries Headquarters
2114 Bemidji Ave
Bemidji, MN 56601

EDITOR'S NOTES

The Newsletter Editors workshop at the AFS Parent Society meeting in San Antonio was a success. We had around 30 attendees representing Chapters, Sections, and Divisions, and each bringing a unique set of ideas and problems from their respective newsletters. The only drawback was the time limits we had. Each section of the workshop could have continued much longer than its allotted time. The final product of the workshop, a handbook on the details of producing a newsletter, is scheduled for completion by early 1992 (which reminds me to schedule some time to write my first draft for the chapter on "How Best to Package Information"). Thanks are due to Michael Vanderford for coordinating this workshop.

Other items from the Parent Society meeeting: a new Canadian Aquatic Resources Concerns Section was approved by the membership, as was a History Section. Lee Redmond (MO) was elected second vice-president. Jim Geiger, the raffle committee chair, asked me to thank our chapter members for selling and buying so many tickets. The major raffle prize, a boat, motor, and trailer, was won by the wife of my graduate advisor, Wayne Hubert (WYO).

Other thoughts: Don't forget the Midwest F & W Conference-North Central Division AFS meeting in Des Moines, IA, 1-4 December. A continuing ed workshop on creel surveys will be held there. Contact Pete Jacobson, MN DNR, Detroit Lakes (218)847-1579 for more info. Special fish sessions include Northern Pike Ecology and Management, Catfish E. and M., and large river and stream fisheries.

Many thanks to the field reporters, especially the U of M, who provided the exotic species articles.

Deadline for Items for Next Newsletter
15 December

PRESIDENT'S NOTES

by Jeff Gunderson

As a member of the Minnesota Chapter it may be difficult to picture what the Chapter actually does other than putting on the annual meeting. In fact, I must admit that even as an officer it is difficult to grasp the extent of the Chapter activities. A nomination application that Ginny Snarski and I put together for the NCD Most Active Chapter Award gave me an appreciation for the variety and extent of the activities that we do. I was impressed.

Our Chapter may not have changed the course of fishery management in the NCD or even in Minnesota (yet), but I feel we have made significant contributions to professional development of Chapter members, become more proactive regarding fishery management issues, and are striving to become even better. Our Chapter members have also been very active in the NCD and at the Parent Society level and we have contributed financially to Parent Society initiatives.

Putting the award documentation together caused me to reflect on how we accomplish what we do. I realized that what we do is the accumulation of efforts by many motivated volunteers. Our Chapter doesn't rely on one highly motivated person to make things happen, as so often is the case with other volunteer organizations. Year after year, new people emerge to carry on and to start new initiatives. Some stay active longer than others, but all contribute to the Chapter to help it perform its function in a highly professional manner.

I now realize that the strength of the Chapter lies with a structure which allows motivated individuals to excel and offers a professional atmosphere which gives members a sense of belonging to something worthwhile. I salute those chapter members that have helped make our Chapter a functional, effective organization and encourage everyone to take a look at our Chapter initiatives over the last year as briefly listed in our award nomination (below and next page).

Nomination Form: Most Active Chapter Award North Central Division of the American Fisheries Society

1. **Total Number of Chapter Members:** 161

2. **Number that Belong to Parent Society:** 119

3. **Officers: Pres.: Jeffrey Gunderson, Pres-Elect: Virginia Snarski, Sec/Treas: Don Schreiner, Past Pres: Greg Busaker**

4. **Number and Type of Meetings:** 1. Annual Meeting -- includes technical session, business meeting, banquet and awards ceremony; 2. **EXCOM** meetings (three per year) -- includes Officers, Immediate Past President and four at-large members, committee chairs are also invited; 3. Committee meetings as needed.

5. **Special Activities:** 1. Long-range plan developed; 2. Procedures Manual near completion; 3. Continuing Education Workshop planned; 4. Chapter History being compiled for 25th Annual Meeting; 5. $1200 contributed to Parent Society; 6. Transgenic Fish Position Paper developed; 7. Sending Chapter newsletter editor to Newsletter Workshop; 8. Public Awareness Committee formed; 9. Past Presidents' committee formed; 10. Poster Session Task Force formed; 11. Recruited field reporters to contribute to newsletter; 12. Responded to legislative and management concerns; 13. Press Releases; 14. Long-range planning session is being considered for next Annual meeting. (See additional information on these 1990-91 initiatives).

6. **Membership Recruitment Activities:** 1. A letter is sent to new fisheries employees in Minnesota describing AFS benefits and activities; 2. Complimentary one-year subscription of Chapter Newsletter sent to new fisheries people in the state; 3. A student Activities Committee was formed to inform, recruit and involve students; 4. The Chapter will have a dues check-off on the 1992 parent society membership form; 5. The Membership Committee is proposing a Chapter life membership option.

Overview

The Minnesota Chapter, AFS encourages its members to get involved in fisheries issues and activities within the Chapter, the NC Division, and the Parent Society. The Chapter has annually allocated $800 to help defray the travel expenses of a Chapter officer to attend the AFS Midyear and Annual Meeting. This year the Chapter has also allocated up to $1,000 for the travel expenses of our newsletter editor to attend the Newsletter Workshop at the Annual Meeting. Michael Vanderford, a member of our chapter and former newsletter editor, has

solicited the assistance of our current editor inconducting this workshop. Our Chapter has reaffirmed its support of the activities and needs of the Parent Society through the donation of $1,000 to the Permanent Home Fund and $200 to the Sulley Award Endowment Fund.

Minnesota Chapter members have been very active at all levels of the society in the areas of transgenic fish, exotic species, and rivers and streams issues. We have worked to involve our members in writing letters to support various initiatives important to maintaining healthy fisheries and in giving professional opinions on fishery related issues. Continuing education remains a priority of the chapter and several successful workshops have been facilitated over the last few years. In an effort to become more proactive towards addressing fisheries issues our Chapter has developed our first Position Paper, developed and implemented a Chapter long-range plan, begun to use press releases to educate through the media, established a Public Awareness Committee and provided quick responses to our legislative delegation regarding state and national fisheries and environmental issues. These and other special initiatives are briefly described below, as they related to this past year's activities.

Explanation of activities described in Question 5

1. Our Chapter Long-range Plan was adopted by the membership (See Newsletter in Supplemental Documentation). The EXCOM is working to implement many of the plan's recommendations.
2. A Procedures Manual for the Chapter nears completion. The need for such a manual is well documented. A draft for membership review and input should be ready by this fall.
3. Our next Continuing Education Workshop is scheduled for November 1991 and will focus on age and growth (see letter to George Spangler in Supplemental Documentation).
4. Since our next Annual Meeting is the Chapter's 25th anniversary, it was decided to ask the newly formed Past President's Committee to compile a Chapter History. The information from this documentation will help shape our future by showing us where we've been.
5. The Chapter contributed $1,000 to the Permanent Home Expansion Fund and $200 to the Sulley Award Endowment Fund. This exemplifies our Chapter's commitment to the Parent Society.
6. Our first Chapter Position Paper was produced this year (see supl. doc.). The paperdealt with regulatory control of transgenic fish in Minnesota. Its development was not without debate within the Chapter. The Position Paper eventually was passed by the membership and proved very timely, as state law makers decided where to place regulatory control over transgenic organisms. Control was placed where we felt the safest standards would be imposed and we would like to think our paper had some impact on those decisions.
7. Our Chapter has indicated its support for effective communication to Chapter members by sending our Newsletter Editor to the Newsletter Workshop in San Antonio. This decision was based on a desire to strengthen and improve what is already considered a very strong newsletter (see Supplemental Document).
8. A Public Awareness Committee was formed this year to address two issues identified in our Long-range Plan: 1. the need to raise our Chapter visibility among fishery user groups and state decision-makers and 2. to become proactive in educating these groups on issues critical to fisheries in Minnesota.
9. A Past Presidents Committee was formed this past year to capture and utilize the talents they possess for helping the Chapter accomplish it's business.
10. Posters are an effective way to communicate fishery research findings at Annual Chapter meetings, yet the Chapter had not previously used poster sessions effectively. A newly created task force has developed poster session recommendations for next year's annual meeting.
11. Field reporters were recruited to contribute "news" to the newsletter. This is an attempt to provide better and more timely reports of fishery related activities occurring in Minnesota (see newsletter).
12. Letters were written on behalf of the Chapter regarding legislative and management issues effecting fishery resources (see Supplemental Documentation).
13. The Chapter initiated the use of press releases to reach the people of Minnesota regarding issues of importance to fisheries of the state. Press releases regarding the Environmental Trust Fund and the spread of exotic species were sent to the media this year.
14. A long-range planning session is being considered for a portion of our next Annual meeting based on the Illinois Chapter experience. This should compliment our long-range planning document and provide specific work group activities to implement the plan.

TO ALL MN/AFS MEMBERS:
NOMINATIONS FOR 1992 MN/AFS CHAPTER OFFICERS

Please complete the following form and return it to me by mail to nominate candidates for 1992 Chapter Officers. Nominations must be received by December 30, 1991. You may also contact me by telephone at (218)335-8600.

Chantel Cook, Nominating Committee Chair
Chippewa National Forest
Route 3, Box 244
Cass Lake, MN 56633

PRESIDENT-ELECT: This year preference will be given to candidates with a Minnesota DNR affiliation.

1._____ 2._____
Affiliation_____ Affiliation_____
Telephone_____ Telephone_____

SECRETARY-TREASURER:

1._____
Affiliation_____
Telephone_____

EXECUTIVE COMMITTEE MEMBERS-AT-LARGE: Nominate one or more candidates from each of the four affiliation groups: Academic, Federal, MN DNR, and Open.

1._____ 2._____
Affiliation_____ Affiliation_____
Telephone_____ Telephone_____

3._____ 4._____
Affiliation_____ Affiliation_____
Telephone_____ Telephone_____

5._____ 6._____
Affiliation_____ Affiliation_____
Telephone_____ Telephone_____

7._____ 8._____
Affiliation_____ Affiliation_____
Telephone_____ Telephone_____

RESULTS OF RECENT RESEARCH ON THE SEA LAMPREY, ITS SENSE OF SMELL, AND BIO-CONTROL

by Peter W. Sorensen
Department of Fisheries and Wildlife, University of Minnesota

When the sea lamprey (Petromyzon marinus), a primitive vertebrate which parasitizes other fish, invaded the Great Lakes in the 1930s, the results were devastating. Within 20 years the lake trout fishery had collapsed and many populations of fish were on the verge of extinction. The lamprey's onslaught was finally stalled in the 1960's with the discovery that larval lampreys (ammocetes) are particularly susceptible to poisoning by the Insecticide 3-trifluromethyl-4-nitrophenol (TFM). Subsequently, a lamprey control program based on the regular treatment of lamprey spawning streams with TFM was initiated. This program has enjoyed considerable, but far from total success, and is the cornerstone of the present day lamprey control program which preserves a Great Lakes fishery now valued at 4 billion dollars a year.

It is now obvious to fisheries managers that total reliance on TFM for lamprey control is no longer a viable option for lamprey control. The costs of TFM have skyrocketed. Lampreys have been found spawning in newly cleaned-up waterways and river mouths which are not treatable with **TFM**. And the general public is mounting increasingly vocal opposition to the routine poisoning public waters. The scientific community has long advocated 'integrated biological control' (IBC) or the use of a variety of specialized environmentally sound control strategies, for lamprey control. Three possibilities have been proposed for lamprey: 1) introducing sterile males into the population to reduce reproductive success, 2) developing more effective riverine lamprey barriers and traps, and 3) developing chemical attractants and repellents to capture animals and/or disrupt their behavior.

Together with my graduate student, Weiming, Li, I have been investigating olfactory function (the sense of smell) in the lamprey to determine whether natural odors might be used in a bio-control program. The lamprey has an extraordinarily well developed olfactory system, perhaps the best among the fish. Its olfactory sensory tissue is larger than its entire brain and several anecdotal accounts suggest that lamprey rely water-borne chemical cues to locate spawning streams, mates, and food. The first step in our project has been to use electro-olfactogram recording (EOG) from the lamprey olfactory epithelium to describe the sensitivity of this animal so that subsequent attempts to isolate, identify, and test important odorants can benefit from the knowledge of what kinds of compounds to look for.

We have been investigating 4 classes of chemicals for olfactory activity: amino acids (feeding attractants for many fish), bile salts (proposed migratory pheromones), and hormonal metabolites (putative sex pheromones). Amazingly, with the exception of L-arginine and several compounds derived from it, the lamprey olfactory is anosmic to L-amino acids (41 tested). In contrast, the lamprey detects L-arginine at concentrations approaching 10^{-11}Molar (M), the lowest threshold for an amino acids found in a fish. Equally surprisingly, lamprey detect amines (22 tested) much better than all amino acid except for L-arginine. We have also discovered that the lamprey olfactory system is extremely sensitive and specific to bile salts. For example, taurollthocholic acid-3-sulfate is detected at concentrations at least as low as 10^{-12}M, or 1 gram in 3 billion liters of water. This sensitivity is both different from other fish and specific. Sixty-two sex steroids and prostaglandins have been tested at a concentration of 10^{-6}M. Although most of these compounds were undetectable, 11β-hydroxyetiocholanolone-3-glucuronide, a metabolite of testosterone, and metabolites of prostaglandin $F_{2\alpha}$ have some activity.

Our initial year of Sea Grant-funded research has produced compelling evidence that sea lamprey has an extraordinarily well developed sense of smell which is acutely sensitive to a compounds which are of little importance to other fish. These data strongly suggest that a unique set of odors are likely to play pivotal roles in the unusual life history of this destructive fish. This at once suggests that natural odors have great promise for bio-control but that it will be quite challenging to determine their precise identities and what they do. Future research will attempt to confirm the chemical identities, origins, and functions of these odros sos that they can eventually be used for bio-control.

RUFFE IN LAKE SUPERIOR

by Derek Ogle

Ruffe (Gymnocephalus cernuus) were first identified in the St. Louis River Harbor, a tributary at the extreme southwestern end of Lake Superior, by the Wisconsin DNR in 1987. By the Fall of 1990, the abundance of ruffe was estimated at 2 million individuals and ruffe were the second most abundant fish caught in assessment trawls fished by the USFWS. The ruffe is a percid that is native to the rivers and lakes of northern Europe and Asia. It was presumably brought to the St. Louis River in the ballast of ocean-going freighters.

The accidental introduction of ruffe to Loch Lomond, Scotland in the early 1980s indicates what impact we might expect ruffe to have in North America. In Loch Lomond, ruffe were found to prey on the eggs of native whitefish stocks and were implicated in the decline of European perch (Perca fluviatilis) populations. In an effort to control the population size of ruffe in the St. Louis River Harbor, DNR management efforts focused on increasing the number and size of potential predators of ruffe. These management efforts took the form of restrictive harvest regulations and increased stocking for walleye, northern pike, and muskellunge. In 1989, we began a Sea Grant funded study to investigate the trophic relations of ruffe to help determine the potential impact of ruffe on the native fauna and to offer insight into the effectiveness of the top-down control management strategy.

In the St. Louis River Harbor, YOY ruffe first feed on microcrustaceans, predominantly copepods and cladoceran, before switching to a diet dominated by chironomids. Small adult ruffe feed primarily on chironomids and other macrobenthos, with small amounts of microcrustaceans eaten early and late in the summer. Large adult ruffe eat a diverse diet of macrobenthos, with chironomids, trichopterans, and ephemeropterans most prevalent. Ruffe appear to feed most heavily just after sunset and throughout the night.

In 1989 and 1990, ruffe were preyed on to a very limited extent. However, in samples collected to date in 1991, numerous ruffe have been found in bullhead stomachs. Small numbers of ruffe have also been found in the stomachs of yellow perch, northern pike, smallmouth bass, black crappie, and burbot. No ruffe have been found in the stomachs of walleye. YOY ruffe constitute 90% of the ruffe found in predator stomachs.

For further information or to receive a copy of my extensive literature review concerning ruffe please contact me at the address or phone number on the inside cover.

EURASIAN WATERMILFOIL

by Ray Newman
Department of Fisheries and Wildlife, University of Minnesota

The exotic submersed macrophyte, Eurasian watermilfoil (Myriophyllus spicatum), was introduced to North America (Chesapeake Bay area) sometime between 1880 and 1942. It is now present in over 35 states and 3 Canadian provinces and is a major nuisance in eastern North America, the Pacific Northwest and the upper midwest. Although Eurasian watermilfoil has been present in Wisconsin and a nuisance in the Madison, WI lakes since the mid-1960's, it did not reach Minnesota until 1987 when it was found in Lake Minnetonka. It most likely arrived here from Wisconsin via recreational boats. In the four years since its arrival, it has spread from Lake Minnetonka to over 40 metro region lakes and streams including the Mississippi River. It has become a major nuisance in many of these lakes and occupies over half of the littoral area of such lakes as Lake of the Isles, Lake Calhoun and Lake Minnetonka. In many instances it has reached the surface to form dense mats. Its dense growth and propensity to develop matted canopics have adverse effects on boating and swimming as well as being unsightly. Its effects on fish and fishing are unknown, but its dense matted structure as well as the fact that milfoil often out-competes other plants and thus reduces plant diversity suggest that it could have longer term negative effects on fish communities. Access to fishing sites may be restricted, but the milfoil may concentrate fish along its deeper edges resulting in short term increases in angling success. However, its nuisance properties demand control and many of these control strategies might also have undesirable effects on fish communities.

Most attempts to control milfoil have involved chemical and mechanical control. These controls are expensive ($100-$1500 per acre), potentially harmful to non-target organisms and require repeated treatment. They rarely result in any long term declines. Chemical treatment with 2, 4-D (e.g., Aquakleen) or fluridonc (Sonar) can be effective and selective for milfoil, if done properly. However, public concern for the use of chemicals, non-target organism effects and cost make chemical treatment less than desirable. Harvesting is effective at removing the top five feet of plants, but often requires repeat treatment within a year, is also expensive, and may increase the spread of milfoil via fragmentation. Furthermore, there is evidence that repeated treatment (chemical or mechanical) may prolong the persistence of nuisance levels of plants and delay the natural declines observed in untreated stands. Biological control would be the most desirable method, but research on this topic is new. Grass carp are a poor choice for Eurasian watermilfoil control because milfoil is one of their least preferred foods; grass carp would likely eliminate many of our desirable plants before having a significant effect on milfoil. A fungus, requiring yearly application, is currently being tested for licensing and work in Vermont and Canada (soon to be extended to Minnesota) suggests that several invertebrates (a midge, a moth and a weevil) may prove to be useful control agents. More research on biological controls is clearly needed.

As with any exotic, the best "solution" is prevention by denying access to our waterways. Regulations aimed at reducing the further spread of milfoil and other exotics have been implemented and widely publicized in Minnesota. Possession and transport of Eurasian watermilfoil is prohibited. Early infestations can be eradicated by hand pulling, dredging or chemical treatment, however, this requires diligence and quick actions. Once milfoil has spread to many systems in an area eradication is simply not feasible and a program of sustained control must be developed. This is likely a long term problem and more research on the effects of milfoil and milfoil control strategies on fish is needed. Control methods that are less disruptive than the milfoil need to be developed.

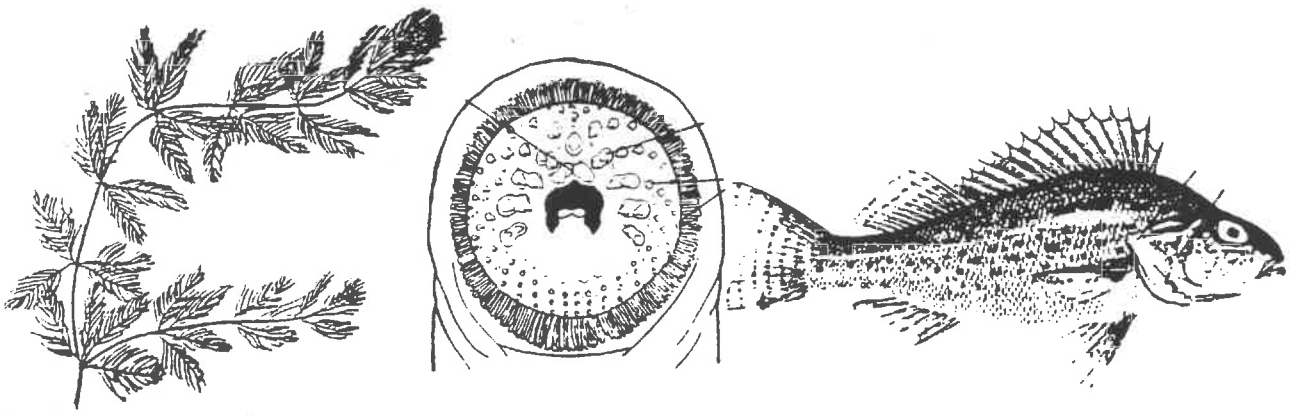
ZEBRA MUSSEL FOUND IN THE MISSISSIPPI RIVER

An article I read in the Friday, September 13, 1991, edition of the Minneapolis Star Tribune reported what we all knew would eventually happen. U.S. Fish and Wildlife Service biologists found a zebra mussel attatched to a native clam near LaCrosse, WI.

The Star Tribune article, written by staff writer Dean Rebuffoni, quotes Leif Marking, head of the LaCrosse FWS laboratory, as saying, "It's exciting to report this finding, but it is also disgusting. I've been predicting that we would soon find zebra mussels in the upper Mississippi, but I'm really sorry to have to report this finding."

Mr. Rebuffoni's article says, "The site near LaCrosse where the mussel was found is more than 500 miles upstream from a spot on the Illinois River where conservation officers found zebra mussels in June. It appears that the creatures entered the Chicago River from Lake Michigan, then moved down the Illinois and into the Mississippi.

"Ironically, the biologists were searching for native clams to be used in a federal program to control the prolific zebra mussel. Native clams are being exposed to chemicals that scientists hope will kill zebra mussels but not harm American species."



MACROPHYTE REMOVAL TO ENHANCE FISH POPULATIONS, Tim Cross, DNR Hutchinson

Lakes with "stunted" bluegill populations are a frequent problem for Minnesota fish managers. In many lakes, excessive aquatic macrophyte cover is thought to be a major contributor to the problem. At high densities, macrophyte cover protects bluegills from predation and allows them to proliferate, leading to density-dependent reduction of growth.

The Hutchinson DNR research unit has recently completed a project in which macrophyte cover in two lakes was experimentally removed. The goal of this project was to improve growth and size structure of bluegill. Fish populations were monitored in two Wright Co. lakes (Mary and Ida) before, 1986-1987, and after, 1988-1989, mechanical harvesting of aquatic macrophytes. Macrophyte cover in selected quadrants (0.8-1.0 ha) was harvested in patterns that resulted in 50% and 75% removal, as well as clearcut. About 6%-11% of the total macrophyte cover in the lakes was harvested. A third lake, Bass Lake, was monitored as a reference lake.

Lakewide improvements in growth and size structure of bluegill, largemouth bass, and northern pike were not found in relation to macrophyte harvesting. However, largemouth bass collected mostly at the harvested sites showed improved first year growth. Bluegill populations were controlled by factors other than macrophyte harvesting that caused variable year class strengths.

Improvement of bass-bluegill populations through systematic removal of macrophytes with mechanical harvesting is probably not an appropriate fisheries management technique for many Minnesota centrarchid lakes. In most lakes, continuous large scale removal of macrophytes for several years would be required to obtain the desired change in bass-bluegill populations. This type of effort would be costly. Furthermore, most mechanical harvesting equipment is not suited for lakes with macrophytes located in depths > 3 m or < 1 m.

Harvesting small areas of vegetation (up to at least 11% of the macrophyte cover) for boating lanes and other recreational uses does not adversely affect fish populations in lakes with greater than 20% macrophyte coverage. In addition, removal of macrophytes may provide some localized benefits to largemouth bass. However, removing large amounts of macrophytes should be done cautiously because of the potential for negatively altering fish and plant communities.

GENETICS OF WALLEYE IN MINNESOTA by Mike McInerny, DNR Hutchinson

Gentic characteristics of walleye collected from 11 locations in Minnesota were analyzed with protein electrophoresis on either starch gels or cellulose acetate. Five locations were within the Hudson Bay drainage, five locations were within the Mississippi River drainage above St. Anthony Falls, and one was below St. Anthony falls.

Genetic variation in these walleye was obseved. Allele frequencies at four loci (ADH-1, IDHP-1, sMDH-B, and PROT-4) differed significantly among populations. Cluster analysis indicated that walleye from the Hudson Bay drainage and the Mississippi River drainage above St. Anthony Falls were more similar to each other than to walleye found below St. Anthony Falls.

Minnesota walleye hypothetically arose from two glacial refugia. Our data suggested that walleye from the Hudson Bay drainage and the Mississippi River drainage above St. Anthony Falls originated from a Missourian glacial refugium. Mississippi River walleye found below St. Anthony Falls probably arose from one of several Mississippi River glacial refugia.

Genetic variation in Minnesota walleye could have been affected by indiscriminate statewide stocking. All systems studied except one had been directly or indirectly stocked with fry or fingerlings from other sources. Walleye from those systems receiving fry or fingerlings from the most sources were more heterozygous.

Effects of indiscriminate stocking on these walleye populations were unknown; however, changes in genetic composition caused by indiscriminate stocking are probably irreparable. Other factors such as overexploitation, habitat alteration, and interactions with other species could have masked effects related to stocking.

We recommend that indiscriminate stocking at systems with native self-sustaining walleye populations be discontinued. This could reduce the native population's fitness towards its local environment. Slower growth and poorer survival are probable responses of reduced fitness.

FIELD REPORT: FEDERAL FISHERIES

by Dave Pederson, Federal EXCOM member

Personnel

Hannibal Bolton has left the Winona Fisheries Assistance Office for the Twin Cities Regional Office at Ft. Snelling. As Fisheries Associate Manager - Assistance, Hannibal will be responsible for planning, organizing and supervising technical and administrative activities throughout the eight state region for fishery assistance offices, Fish Disease Control Center (LaCrosse), regional aquaculture and private lands fisheries activities. Congratulations Hannibal!

Paul Pajak has recently joined the FWS Federal Aid staff at Ft. Snelling. Paul comes to us from the Wisconsin DNR, Bureau of Fisheries Management, where he was responsible for the Bureau's Milwaukee River watershed restoration program. Paul has been an active member of the Wisconsin AFS Chapter, where he was chairman of their Long Range Planning Committee. You may also have read his essay, "Fisheries Implications of the 1990 Farm Bill" in the July-August edition of FISHERIES magazine.

Interest earned from license fees

Interest, dividends or other income earned on hunting and fishing license revenues is estimated to amount to $33 million annually nationwide. In Minnesota the estimate is $1.2 million.

Two years ago (April '89) the Fish and Wildlife Service issued a rule requiring that interest earned on license revenues be treated as license income (many states already directed the interest income back to the fish and wildlife agency for use in program administration). The rule was implemented without controversy.

In April '91, the FWS submitted a new comprehensive rule for the Federal Aid in Sport Fish and Wildlife Restoration programs, which was necessary because of recent changes made affecting all federal grant programs. The new proposed rule incorporated those changes and also consolidated a lot of Federal Aid program requirements, including the investment income provision from the '89 rule.

While this draft was being reviewed by the Office of Management and Budget (OMB), the interest income provision unexpectedly became a controversial issue. The National Governors Association and many state budgetary officials argued (with support by White House Chief of Staff Sununu) that states should not be directed how to use investment income.

This was countered by an organized response from the International Association of Fish and Wildlife Agencies, the Wildlife Management Institute, AFS and others. MN Chapter President Gunderson wrote to President Bush, Governor Carlson, and the Minnesota congressional delegation.

As the debate grew, the White House, Interior Department (Fish and Wildlife Service) and OMB mutually agreed that the situation could best be defused by withdrawing the controversial proposed rule from further consideration. Thus, the earlier '89 rule remains effective, preventing the diversion of interest income.

Revised rules for the Federal Aid programs still need to be resubmitted. However, next time it will be without the interest income provision.

FIELD REPORT: DNR FISHERIES MANAGEMENT

by Taylor "Eurasian Watermilfoil KILLS Lakes*" Polomis

Summer fieldwork has wound down. Our area office recently completed two warmwater stream population assessments-- many of those wonderful not-so-easy to identify minnows. Oh well; some dace are like that. Luckily our eager young intern, **Wayne Christopher**, fresh from ichthyology class, was along to help refresh us. (Is the peritoneum greyish-black or silvery?)

DNR fish types, especially those in the metro, are breathing a collective sigh of relief, having overcome another State Fair. A hand is due all who pitched in, especially the coordinator of our fish display, St. Paul Hatchery Manager **Donn Schrader**. Around the time of "The Great Minnesota Get-Together" debate heats up about the merit of the effort. Is the product worth the headaches and cost? (Some say no.)

Are fair displays an appropriate means of conveying our message regarding fisheries resources, or are we continuing to foster a circus or zoo atmosphere? Are we right in taking trophy-class fish from public waters to possibly die because of confinement (despite stellar, round-the-clock efforts of hatchery staff to alleviate stress) or poaching in off-season holding ponds? Or is this one of the only chances we have to "show off" and proactively face our public? I do know many people comment positively on the exhibit. I also know employees with fair-induced hypertension and decreased life spans (caused by stress and, presumably, consuming foods God never intended to be deep-fried).

People & Places: Congrats to those receiving recent promotions or new positions: **Steve Hirsch**, Fisheries Program Manager, **Quentin Kramer**, Management Specialist in Lake City, and **Brad Carlson**, Management Specialist in Montrose. We say goodbye to two retiring Area Fisheries Managers: **Ken Schumann** at Hutchinson and **Dick Trombley** at Hinckley. **Tim Brastrup**, heretofore Assistant Regional Manager in Brainerd, will transfer to Trombley's old position in "Tobie-town". Go west, young man...**Mike Hayes** and **Jerry Wiechman**, Management Specialists at Lake City, are leaving for, respectively, Colorado and Utah. Returning after a leave of absence is **Don Pereira**, coming into the newly created position of Large Lake Biologist. (To all the Large Lake Specialists: welcome Pereira back by giving him some "hahd dater" to analyze.)

* From an unapproved sign seen at many metro accesses; I suspect the killing was done in the kitchen with the candlestick (and Col. Mustard concurs).

FIELD REPORT: TRIBAL FISHERIES

By Dave Conner, EXCOM Member-at-Large

In this and upcoming reports I will provide information on how tribal fisheries programs operate in general, and I will also describe aspects of individual programs. In this report I discuss the United States Fish and Wildlife Service (USFWS) Fisheries Assistance Program, and the fisheries program at the White Earth Indian Reservation.

Fisheries Assistance

In the last report I mentioned that 6 Chippewa Indian Bands in Minnesota conducted fisheries management activities. However, not all of them have the financial resources to retain fishery biologists and staff. The USFWS Fishery Assistance Offices (FAO's) provide fishery assistance to Indian Tribes that ranges from technical advice on projects that the tribal biologist may be unfamiliar with, to complete assessment and management activities in cases where there are no tribal biologists on staff. The FAO's conduct activities at the request of the Band, and in most cases, these services are paid for by the Band under a cost reimbursable agreement. Two FAO's provide services to Indian Bands in Minnesota: The Winona FAO, headed by Hannibul Bolton; and the Ashland FAO, headed by Tom Busiahn (Tom was formerly Biological Services Director for the Great Lakes Indian Fish and Wildlife Commission, having recently replaced Reed Glesne at the Ashland FAO). The FAO's have done a good job at filling information gaps that exist on many Indian Reservations due to the lack of sufficient funding to provide for complete programs.

White Earth Fisheries Program

The White Earth Conservation Department was established in 1977 with the appointment of four tribal game wardens to enforce tribal game laws. A biologist was appointed in 1979 to assist with formation of a conservation code after federal courts upheld Indian Tribes' inherent rights to self-government. Today the White Earth Conservation Department's staff consists of one biologist, fisheries, wildlife, wild rice, and water quality managers, four technicians, four game wardens, and four seasonal technicians.

Ongoing fishery operations include creel censuses, lake surveys, walleye fingerling rearing, monitoring winter oxygen levels in area lakes, and regulation of commercial bait and rough fish harvest. Other projects include adult and young of year walleye assessments on all major fishing lakes, and the construction of four fishing piers for the elderly and handicapped.

A fish hatchery and rearing facility was

constructed in the fall of 1989, with an initial 48 quart hatching capacity. Four half-acre drainable rearing ponds have produced more than 125,000 2" walleye fingerlings for stocking public waters since 1990. In addition to these, 12 natural rearing ponds are managed, and they produce about 3,000 pounds of 6 inch fingerlings annually, which are also stocked into public waters. Northern pike, rainbow trout, smallmouth bass, and black crappie have also been stocked when warranted.

For further information on the White Earth Program contact Fisheries Manager Randy Zortman at: 218-573-3007.

25th ANNUAL MEETING UPDATE

The 25th Annual Meeting of the Minnesota Chapter of the American Fisheries Society will be held on March 10-11, 1992 in Duluth, MN.

The program is still under development; however, it will include contributed papers on general fisheries and aquatic resources subjects. In addition to oral presentations, a formal poster session is being organized for this meeting. (Please see the enclosed article on posters.) I encourage you to start thinking about a paper or poster you'd like to present.

Our annual fundraising will include a raffle, with winners determined at the banquet. Henry Van Offelen, DNR in Hinckley, has volunteered to help with this. This year we are going to try something new -- procuring prizes early and selling tickets prior to the meeting. We hope to get money out of pockets other than only those of Chapter members. If our solicitation efforts work, we hope to have a some raffle items available only for those in attendance. We could use your help with this fundraiser, both in getting donations and in selling tickets. Contact Henry [(612)384-7721] or me if you are willing to help.

Look for additional meeting information in the next issue of the Newsletter.

Special Note to Professors/Instructors: We encourage presentations by undergraduate and graduate students. Please notify your students of this opportunity and encourage their participation.

If you have questions or suggestions contact: Ginny Snarski (Address and phone behind Newsletter cover).

PROPOSED MN AFS POSTER SESSION

by Jeff Denny and George Howe

The MN AFS will organize a poster session for the 25th Annual Meeting in Duluth. Posters could become an ongoing activity at chapter meetings. The call for posters and abstract preparation is the same as the call for papers. Specific instructions on how to prepare posters will be sent to presenters after abstracts have been accepted.

Poster sessions have gained wide acceptance in the scientific community as a means of communicating information and providing an alternative to formal platform presentations. Posters provide a better opportunity for interacting with the authors and enhance individual discussion of research interests. They also offer the viewer greater flexibility. This can provide a relaxed and truly enjoyable exchange of scientific ideas.

Standard poster size is usually 4 X 6 ft. Boards will be provided by the society. Authors need only bring their materials and pins or velcro. Posters are organized in standard scientific format with title, abstract, methods, results, discussion, and summary.

Posters will be set up in a designated area of the meeting room on the first day of the meeting. On the second day there will be a viewing/interaction time of 2 hours set aside specifically for posters with refreshments served. Authors will be required to accompany their posters during the session. Evaluation criteria for awards have not been developed yet, nor has a limit been set on the number of posters These things will develop as the program matures.

Consider presenting a poster this year. The bottom line is that the author is not doing anything different professionally. It is a matter of using photos and text rather than slides and verbiage!

Committee Reports

MEMBERSHIP
Tim Goeman, Chair
The Minnesota Chapter currently has a mailing list totaling 328. There are 163 paid members for 1991, with 72 people receiving one-year complimentary mailings as an incentive for membership. We presently mail our newsletter to 27 parent society executives, other state chapters, and North-Central Division officers. Remember to watch for the state chapter dues check-off on the parent society dues renewal notice, but we will also be collecting dues at the annual chapter meeting in March. Growth of paid memberships in the state chapter has increased substantially from the 124 paid members in 1990. Membership information for the parent society is available from me at any time.

PAST-PRESIDENTS
Dick Siefert, Chair
The Past-Presidents committee is in need of photos and information pertinent for a Chapter history poster to be displayed at the 25th annual meeting this March. Members, retired members, past-officers, and other knowledgeable and interested parties are encouraged to contact Dick at the address or phone on the inside cover. All input will be greatly appreciated!

RIVERS AND STREAMS
Henry Drewes, Chair
The Rivers and Streams committee is presently looking into developing a policy statement on snag removal. This is in response to a news release describing a DNR-Division of Waters program whereby people can apply for grants to remove trees, snags, and boulders from streams. In that a great sum of money is spent PLACING this material IN streams and they provide cover necessary for many game and non-game species, this program would seem of questionable merit.

LONG RANGE PLANNING
Tracy Close, Chair
The Minnesota Chapter AFS Long Range Plan has been formally accepted. The officers will now have a document to help set priorities, strategies, and action agendas. There will be a portion of the Annual Meeting dedicated to the plan, what it means, and how it will help the Chapter move into the future with strong goals and visions.

PUBLIC AWARENESS
Steve Quinn, Chair
The Public Awareness committee is proud to announce that our recruitment drive is well underway. The announcement in the June Newsletter encouraged seven volunteers for this new committee. All have lots of ideas and enthusiasm that should allow us to accomplish valuable projects for the Minnesota Chapter.

I encourage more members to join us. We'd like to establish a communications network throughout the state that can be effective in dealing with politicians, the media, anglers of various persuasions, and the general public. Please address inquiries to Steve Quinn at the address and phone number inside the cover.

Current members are: Jeff Berrington, Minneapolis; Mark Gross, St. Paul; Jeff Gunderson, Duluth; Ken Kurzawski, St. Paul; Henry Van Offlen, Forest Lake; Taylor Polomis, St. Paul; Jeff Reed, Glenwood, and Steve Quinn, Brainerd.

STUDENT REPRESENTATIVES
Loren Miller and Derek Ogle, Chairs
The call for information in the last newsletter provided good information on students and programs for the committee to contact. We welcome any further information to help establish the communications network of students throughout the state.

At the Parent Society AFS meeting in San Antonio, a Student Sub-section of the Education Section was established. This was done to allow the student voice to better be heard and to introduce students to what the Parent Society is all about.

AWARDS
Steve Colvin, Chair
At the Annual Meeting in March, there will be a new Best Poster Award along with the current Best Paper Award. Also, look for a presentation of the Chapter Award of Excellence.

CONTINUING EDUCATION
Mark Cook, Chair
Don't forget to sign up for the workshop on age and growth models scheduled for November. Info and forms appear in this issue!

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