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NEWSLETTER of the Introduced Fish Section American Fisheries Society

March 1995

Don Baltz, Editor

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PRESIDENT'S CORNER

Past-President's Farewell--Denny Lassuy

Whew - what a ride! Space Mountain has nothing on the Introduced Fish Section! Thank You to Hiram Li for suggesting I get a ticket for the ride. Thanks to Mark Konikoff for helping tighten the screws on the track (you did tighten them, right Mark?). Thank You to Don Baltz for serving as the true engineer and keeping us on track. Thanks to Paul Brouha and the AFS central office for two years of professional mentoring and assistance. And most especially, THANK YOU to all of the IFS membership for keeping IFS alive and vibrant and at the center of focus on some of the biggest issues facing fisheries and aquatic ecosystem management today.

During my two years at least titularly "at the helm," I hope that IFS has grown stronger internally through its willingness to openly discuss, sometimes debate, the role(s) of introduced species in aquatic ecosystems and the incredible depth and breadth of factors that come into play in making the conscious decision to tinker. I was greatly encouraged in Albuquerque (the "Uses and Effects" workshop) by the unity of purpose shown by IFS members of clearly different philosophies in once again endorsing strict adherence to the AFS Protocol for species introductions. However, I must also admit considerable disappointment that even by the time the proceedings of that workshop got to press, some of that unity was abandoned. We must continue with healthy debates, but as importantly, we must not allow ourselves to serve as tools of divisiveness through personalization and mistrust. In short, we must remain professionals.

My parting (if preachy) message is that I urge you all to remain, as I will, committed to intelligence in our human tinkering. Keep IFS (and hopefully, thereby AFS) focused on the performance and promotion of good science and informed decision making to ensure that we do not compromise our biological inheritance or the evolutionary capacity that bestowed it upon us.

Do not leave the task to others; do not dither, lest you endanger.

Finally, I encourage all IFS members to participate more fully in the section by sending along your news items, comments, and inquiries to Don Baltz (address at end of newsletter) and to volunteer your time and considerable talents to supporting the new IFS leadership. Best of luck to Neal, Eric, and Larry! They are an excellent slate of leaders with a perfect blend of backgrounds to carry us into the coming years.

Incoming President--Neal Foster

My initial message as IFS President is necessarily a short one, inasmuch as we have a bunch of other things to include in this issue of the newsletter, not the least of which is the call for abstracts of papers to be presented at the IFS-sponsored paper session at the 1996 AFS meeting in Dearborn, MI. Please note the January 5th deadline!!

First of all, I'd like to thank Past-President Denny Lassuy for all the hard work he did in behalf of the IFS and for helping me to gradually get up to speed as new President. I'd also like to express my appreciation to Don Baltz for continuing the excellent job that he has been doing on the newsletter. In addition to our common interests and concerns about introduced fishes, nonindigenous or genetically modified fish stocks, and other nonindigenous organisms, it is the newsletter that is the informational glue that holds our IFS Section together. I also thank Larry Zuckerman for agreeing to stay on as Secretary-Treasurer. I've served in that capacity for the Early Life History Section and appreciate all the tedious paperwork and attention to accuracy and detail the office entails. Finally, I'd like to say how honored I feel to have been asked to run for this office. I see my most immediate priority as doing as careful and thorough a job as possible on putting a bang-up paper session together for the August AFS Meeting. I strongly encourage you, your students, or your colleagues to send me abstracts of papers to be presented in Dearborn. In the meantime, I hope you enjoy the holiday season.

FROM THE EDITOR

We're entering the information age, whether we like it or not, and maybe it's time to begin to consider other forms of communication. The newsletter format is slow, non-interactive, expensive, non-graphical, etc.

I am looking into developing a WorldWideWeb IFS Homepage and am wondering how many of you are connected to the information superhighway. Let me know if you could access the page or plan to be able to in the near future by dropping me an e-mail message with the subject line: IFS homepage. My e-mail address is ocdon@unix1.sncc.isu.edu. A homepage could reach a much wider audience and get our messages out to non-members of the section. It would also be a great recruitment tool for IFS and AFS.

Eric Hallerman has proposed the idea of a listserv for the section. It would facilitate immediate distribution of information, and save lots of mailing expenses. A listserv could be reserved for paid members of the section. If you have thoughts on a listserv for IFS, I suggest you contact Eric by e-mail (ehallerm@vi.edu) or using one of the addresses in the list of officers.

IFS ANNUAL MEETING IN TAMPA '95 & NEW IFS OFFICERS

For those IFS members who were able to attend the annual meeting in Tampa it was a wonderful success - both the larger AFS meeting (see November, 1995 issue of Fisheries for wrap up) and the IFS meeting. Though an IFS-sponsored session on aquarium fishes did not develop as we'd hoped, the IFS poster and video presentation was a big hit. The poster featured photo depictions of some of the beneficial uses (sport fishing, biological control) and the unintended impacts (habitat alterations, species extinctions) of introduced fishes and highlighted IFS role in sorting out and understanding both. The video (mentioned in previous newsletters and discussed briefly below in the Annual Report summary) consistently drew large crowds. I will be encouraging annual meeting organizers to include Section posters at all future poster sessions. I believe it will prove to be an excellent advertising forum for increasing Section membership.

I understand that our incoming president (see President's Message) is already hard at work on involving IFS in session sponsorship at next year's annual meeting in Dearborn, Michigan. While I'm at it, I will here commit to trying to pull off a variation of the aquarium fishes session we tried this year at the following year's annual meeting in Monterey, California, perhaps highlighting the role of public aquaria. They have a wonderful aquarium in Monterey and a number of folks in the leadership of the AZA have expressed a strong interest in possibly cosponsoring such an event.

The IFS business meeting was attended by 16 people from across the country, including representation from Oregon, Colorado, Wyoming, Alabama, North Carolina, Illinois, Virginia, California, Arkansas, Michigan, host state Florida, and the AFS Central Office in Bethesda, Maryland. After discussion by Dr. Cassani and Beth Staehle (AFS Publications) of the content of the text and the options for publication, IFS President Lassus moved the following:

"The Introduced Fish Section (IFS) shall continue its sponsorship of Dr. John Cassani's effort to develop and publish the text "Managing Aquatic Vegetation with Grass Carp: A Guide for Water Resource Managers" and shall, contingent upon the availability of sufficient Section funds and contingent upon Dr. Cassani and the AFS Central Office having, not later than December 31, 1995, raised or received written assurance for the provision of a majority of the funds needed to reach projected completion over the costs, commit to providing up to \$1000 toward project completion over the course of the publishing process. IFS also encourages Dr. Cassani and the AFS Central Office to seek similar or larger financial commitments toward project completion from other AFS Sections."

The motion was seconded by Dr. Chris Koehler and passed by unanimous voice vote.

The IFS 1995 Annual Report (immediately below) was discussed, election results announced, and the gavel passed to our new slate of officers. Congratulations to President Neal Foster, President-elect Eric Hallerman, and Treasurer Larry Zuckerman!

Summary of Items from 1995 IFS Annual Report to AFS Excom:

- 1) Uses and Effects of Cultured Fishes in Aquatic Ecosystems -- This AFS conference came to fruition with publication of the proceedings in 1995. The Introduced Fish Section put together one of its sessions (now a Chapter in the

proceedings) and many nonmember members of IFS attended the conference, presented papers, served as editors, and otherwise contributed to its successful conclusion. The strength of the IFS is reflected both in the diversity of "approaches" reflected in IFS member contributions to the conference and in the unanimity of IFS members in resolving to improve introduced species decisions and management.

2) Grass Carp Text -- In 1993, IFS took on as an official project the development and publication of a text on the use of grass carp as a management tool in aquatic weed control. Dr. John Cassani has been the driving force behind moving forward with the development of this project and has the text (reviewed and preliminarily edited by many IFS members) ready to move to publication. IFS expects at this 1995 Annual Meeting to finalize Section decisions on continued sponsorship of the project and involvement in its publication.

3) RAMming ahead -- The Risk Assessment and Management (RAM) Committee of the Task Force set up under the Nonindigenous Aquatic Nuisance Prevention and Control Act has recently drafted a "generic nonindigenous aquatic organisms risk analysis review process" for public comment. The Introduced Fish Section is currently in the process of reviewing and developing comments on the proposal.

4) IFS Newsletter -- Under the able guidance of newsletter editor Don Baltz, the IFS Newsletter continues to sound the science and share the solutions! Because Don and several IFS members have learned how to surf (the Internet), IFS members are becoming ever more knowledgeable of the international importance of and global concerns with the transfer of aquatic organisms. We are also on a record pace (at least in recent history) for Newsletter publication with three newsletters already distributed to IFS members in 1995.

5) Strangers in Our Waterways -- Though not officially an IFS project, many members of IFS have contributed their knowledge, editing skills, and even film footage toward the completion of a new video on introduced species. It's an ACEI! Entitled "Strangers in Our Waterways," the video was finally completed this spring by the Agricultural Extension Service and has already won the Gold Medal (first place) award from the Agriculture Communications Educators (ACE). Want to see it? IFS will be showing this video at the poster session of this year's annual meeting in Tampa.

IFS-SPONSORED SYMPOSIA AT 1996 AFS ANNUAL MEETING

The 1996 Annual Meeting of the American Fisheries Society will be held at the Hyatt Regency Hotel, Dearborn, Michigan, 25-29 August 1996. The overall theme of the AFS conference is "Sustainable Fisheries: Economics, Ecology, and Ethics." Inasmuch as this venue lies in the heart of the Great Lakes Basin, where at least 140 exotic aquatic species have become successfully established since the late 1800s, it seemed particularly appropriate to include a special session of papers that entitled "Introductions of Nonindigenous Fishes or Other Aquatic Species: Impacts and Implications," organized by Neal Foster. Presenters for 19 oral and three poster papers were recruited via the Internet in what was originally supposed to be just a preliminary call for papers, but this number was more than enough for inclusion in a symposium proposal presented to the Program Committee in mid-

December and for the one-day maximum time slot allotted. We apologize to our fellow IFS members, for due to a combination of unfortunate circumstances, we were unable to get out a planned IFS newsletter in late '95 with an additional call for papers for section members -- the final deadline for titles and authors was January 10, 1996. However, the first, second, and third general calls for papers along with other information about this forthcoming AFS meeting did appear in the September, October, and November 1995 issues of FISHERIES, respectively. We will present more details about this symposium in the next newsletter. Meanwhile, for more information, contact Neal R. Foster by e-mail (preferred): neal_foster@nbs.gov OR nealrfs@nbs.gov, by FAX: 313-994-8780, phone/voice mail: 313-994-3331-x264; or by conventional mail: National Biological Service, Great Lakes Science Center, 1451 Green Road, Ann Arbor, MI 48105-2807. There will be two additional symposia at the Dearborn meeting of considerable interest to IFS members. The Introduced Fishes Section will co-sponsor with the Genetics Section a symposium entitled "A Computer-based Expert System for Assessing and Managing Risks Posed by Genetically Modified Aquatic Organisms," organized by Eric Hallerman, IFS President-Elect, and we will further co-sponsor with the Fish Health Section and the Great Lakes Fishery Commission a third symposium, "Private Aquaculture Safeguards for Great Lakes Biological Integrity," co-organized by IFS member Margaret Dochoda, Great Lakes Fishery Commission, Edward Mills, Cornell University, and Don Garling, Michigan State University. We will present more information about these three symposia in the next newsletter.

CORRESPONDENCE

Whirling Disease: a problem of exotic parasites or natural stressors?

..... Correspondent: Robert Behnke
[The debate continues, hatchery spokespersons also blame inbreeding depression and interspecific competition in attempts to spread the blame and confusion. A recent article Robert Behnke in the Autumn 1995 issue of *Trout* is excerpted here--Ed]

Although no feasible solution to the problem of whirling disease and wild rainbow trout has been suggested yet, several events, including the Montana Council's creation of a Whirling Disease Foundation, which organized a highly informative conference in May, and comprehensive new reports by the Colorado Division of Wildlife and the Montana Department of Fish, Wildlife, and Parks, have helped us refine the critical questions.

A basic question is one of nature vs. nurture: why do some wild rainbow trout populations with long exposure to whirling disease--Truckee River, California, for example--show no apparent decline while others, such as those in the Madison River in Montana and the Upper Colorado River in Colorado, have suffered declines of 90 percent or more in just a few years? Do genetic differences make some rainbows more resistant than others? Or do environmental differences in particular rivers or reaches limit or increase the rate of infection?

[Much material omitted here--Ed]

The Montana Fish, Wildlife, and Parks whirling disease report addresses short term and long term problems and research recommendations. Plans are to take a "wait and see" approach on the Madison River rainbow population.

The Colorado report, however, attempts to spread the blame, raising questions on gas supersaturation, other parasites, bacteria, fungi, etc. as "stressors" which contribute to mortality in trout impaired by whirling disease. There may be some truth to the theory, but the fact is these other "stressors" don't affect

browns and they didn't affect rainbow trout before whirling disease appeared. "Other stressors" simply give the final push to a fish on the edge. And what can be done about these "other stressors" anyway? Whatever the questions remaining to be addressed, one answer is clear: there is an enormous amount of research to be done on many aspects of this disease. We've only begun to search for answers.

Goby Found in Duluth-Superior Harbor

..... Correspondent: Eric Hallerman

A new fishy invader, the first reported for Lake Superior (not really!--Ed), has shown up in the Duluth-Superior harbor. It's the round goby (*Neogobius melanostomus*), a small bottom-dwelling fish with distinctive frog-like raised eyes and a black dorsal fin spot. The 4-1/2 inch fish was found July 19 by a national Biological Service fishery research crew under a Minnesota Sea Grant project. It was captured in five meters of water near the Blatnik Bridge during bottom trawling for Eurasian ruffe, another exotic fish.

"Due to its large size, we think it's lived here awhile," said Doug Jensen, Minnesota Sea Grant exotic species information coordinator. "These fish were originally introduced near Detroit via ballast water tanks from transoceanic ships. The screening on those tanks is up to a half-inch. So if this fish was introduced that way, it's had some time to grow." Additional sampling in the area has failed to yield additional specimens. [Minn. Sea Grant Seiche newsletter September 1995]

Goby Found Again in Duluth-Superior Harbor

..... Correspondent: Neal Foster

A second round goby (*Neogobius melanostomus*), an exotic fish, has been found in the Duluth-Superior harbor. The 4-inch fish was found in five meters of water near the Blatnik Bridge on November 7 by a National Biological Service (NBS) research crew. (The first goby found in Lake Superior was discovered in July, also by an NBS crew, very close to the same location.) The NBS crew was trawling for Eurasian ruffe, another exotic fish, for a collaborative project with Minnesota Sea Grant and the University of Minnesota.

"The second sighting suggests there is a small adult population of round gobies in the Duluth-Superior harbor," said Jim Selgeby, Chief of the National Biological Service's Ashland, WI, Laboratory. "Although no young gobies have been found yet, this adult population is capable of reproducing. I expect we'll find more next year."

The round goby is a small bottom-dwelling fish that is mostly slate-gray, with frog-like raised eyes, a prominent black spot on the dorsal fin, and has a distinctive scallop-shaped pelvic fin. A one-page fact sheet, "Round Gobies Invade North America," is now available from Minnesota Sea Grant. It describes the gobies' range and spread, characteristics and habitat, and potential impacts, along with information on what can be done to stop their spread. For copies of the sheet, please contact Minnesota Sea Grant, (218) 726-6191. To aid people in identifying this nuisance species, Sea Grant is also preparing a wallet-sized card which will be available by early February, 1996.

If anglers catch a round goby in Lake Superior, they are urged not to throw it back alive. They should kill it, freeze it, and contact Minnesota Sea Grant, (218) 726-8712; or the National Biological Service in Ashland (715) 682-6163; or the Minnesota DNR Exotic Species Program in St. Paul, 1-800-766-6000, (612) 296-2835, or a local fishery office.

The round goby was introduced through ballast water discharge from transoceanic ships. At about the same time the first round goby was discovered in the Great Lakes, the federal Nonindigenous Aquatic Nuisance Prevention and Control Act (NANPCA) of 1990 was passed by Congress to help prevent

introductions of problem species such as the round goby. The NANPCA is up for reauthorization by Congress this year. Many experts from the Great Lakes states think it is essential to reauthorize and strengthen the act in order to prevent future introductions of harmful species such as the round goby, ruffe, and zebra mussel.

Like the zebra mussel and Eurasian ruffe, the round goby is native to the Black and Caspian seas. Round gobies were first discovered in North America along with their cousin the tubenose goby (*Proterorhinus marmoratus*) in 1990 in the St. Clair River near Detroit. The tubenose goby did not thrive, but the round goby quickly spread into lakes Erie and Michigan where the largest infestations are now found. Gobies eat aquatic insects, mussels and snails. They can grow up to a foot long, but specimens found in the Great Lakes so far have not exceeded 10 inches.

Gobies are considered undesirable because they can compete with native fishes for habitat and change the balance of the ecosystem. Round gobies are already causing problems for other bottom-dwelling Great Lakes natives like sculpins and darters. Gobies eat fish eggs and young, take over optimal habitat, spawn multiple times a season, and can survive poor water quality conditions.

For additional information about the round goby, please contact Jim Selgeby, National Biological Service, Ashland, WI, (715) 682-6163, or Doug Jensen, Minnesota Sea Grant, (218) 726-8712. [Minnesota Sea Grant and National Biological Service News Release (November 21, 1995), Fact Sheet available from Sea Grant, contact Marie Sales: (218) 726-7677]

Fisheries News

Correspondent: Gene Buck

[Gene Buck is a Senior Analyst for the Congressional Research Service and publishes weekly summaries of fish related issues for Congress. This is a selected subset of news items of potential IFS interest extracted from <FISH-ECOLOGY@SEARN.SUNSET.SE> with Gene Buck's permission. Gene is always looking for new fisheries issues to communicate to Members of Congress and their staff. *Editor*]

Items in this summary were excerpted from a variety of news and information sources. CRS is not responsible for the accuracy of the various news items. I would appreciate your feedback on this summary. Comments should be directed to me (gbuck@crs.loc.gov). I will post this summary each Friday on this list as long as I continue to receive helpful feedback on issues. To further assist me in providing a broad scope of information resources to Congress, I would appreciate being added to any mailing lists of publications, news releases, newsletters, etc. relevant to marine mammals and fisheries. Where there is a subscription cost, a sample copy would provide a basis for deciding whether or not a subscription could be justified. Thanks for your assistance in this matter. Archived summaries from the first Friday of each month since July 1994 will soon be available at <http://www.lsu.edu/~sglegal/summaries.html>.

Gene Buck, Congressional Research Service - ENR, Library of Congress, Washington, DC 20540-7450; e-mail: gbuck@crs.loc.gov

Tokyo Bay Exotic Species. On Nov. 27, 1995, Japanese scientists reported that several exotic species in Tokyo Bay appeared to experience population explosions this year, possibly due to depleted oxygen conditions during the summer that were detrimental to native species. Exotic mussels and crabs were thought to have arrived in ship ballast water. [Dow Jones News]

Fisheries Act of 1995. On Nov. 3, 1995, President Clinton signed the

fisheries Act of 1995 (H.R. 716) into law as P.L. 104-43. This measure implements U.S. participation in the United Nations' High Seas Reflagging Agreement (Title I), implements U.S. participation in the Northwest Atlantic Fisheries Organization (Title II), reauthorizes and amends the Atlantic Tunas Convention Act (Title III), reauthorizes and amends the Fishermen's Protective Act (Title IV), restricts U.S. fishing in the Central Sea of Okhotsk (Title V), prohibits U.S. participation in international agreements contrary to the United Nations' moratorium on large-scale driftnet fishing on the high seas (Title VI), and implements U.S. participation in Yukon River Salmon Treaty (Title VII). On Nov. 21, 1995, the U.S. Dept. of State announced that, under the provisions of Title IV of P.L. 104-43, U.S. fishermen will have until Feb. 1, 1996, to submit requests for reimbursement for fishing vessel "transit" fees imposed during June and July of 1994 for travel through Canadian waters between Alaska and the Pacific Northwest. [Congr. Record, Reuters, Assoc Press]

National Research Council's Salmon Report. On Nov. 8, 1995, the National Research Council released prepublication copies of a new report entitled *Upstream: Salmon and Society in the Pacific Northwest*. The report acknowledged the importance for managers to protect the genetic diversity of salmon, and to rely on hatcheries only when and where they will not harm wild, native salmon populations. The report also suggested reducing fishing effort and encouraging more discriminating fishing strategies. Barge transportation of downstream migrating juvenile salmon was deemed the most biologically effective and cost on protecting the spawning habitat of wild salmon. [Assoc Press, Seattle Post-Intelligencer via Greenwire]

Supersalmon Trials. Controversy arose in mid-November 1995 after Otter Ferry Salmon (United Kingdom) announced that it was considering trials of about 300 genetically engineered salmon, capable of growing as much as six times faster than normal salmon. The decision on whether to proceed with the trials will be made by Dec. 25. A Chilean consortium would like to rear the transgenic salmon in Latin America. [Financial Times and London Guardian via Greenwire]

Zebra Mussels. In mid-November 1995, the State of Vermont dismissed a Canadian firm from work designing a zebra mussel control system for a State fish hatchery; the firm was not able to demonstrate or prove its technology for an acoustical sparking system to prevent mussel colonization in a timely manner. On Nov. 26, 1995, the Cleveland Plain Dealer reported that Ohio State University scientists had found nine species of aquatic plants in Lake Erie that were thought to have been eliminated by pollution. These plants may have reappeared in response to zebra mussels improving the clarity of the Lake's water. [Assoc Press]

Bull Trout. On Nov. 8, 1995, a coalition of conservation groups filed a motion in U.S. District Court, Missoula, MT, seeking a preliminary injunction to prevent the U.S. Fish and Wildlife Service from releasing hatchery-reared (and possibly infected) bull trout into Duck Lake on the Blackfoot Indian Reservation in Montana. On Nov. 17, 1995, the previous week's decision by U.S. District Court Judge Robert E. Jones, Portland, OR, to deny the Federal Government's request to dismiss a lawsuit accusing the U.S. Forest Service of allowing logging in four Pacific Northwest States that threatens bull trout with extinction was made public. Judge Jones ordered the Forest Service to report on Dec. 18, 1995, its progress in protecting bull trout on national forest lands. The lawsuit was filed in June 1995 by four Montana environmental groups. [Assoc Press]

Native Gulf White Shrimp Vulnerable. In early July 1995, Texas Dept.

of Parks and Wildlife officials announced new information indicating that native white shrimp in the Gulf of Mexico can be infected by the Taura syndrome, contrary to earlier assurances that native Gulf of Mexico shrimp would not be affected. Taura syndrome was responsible for decimating Asian white shrimp grown at South Texas aquaculture facilities earlier this year. Results of tests on native Gulf pink and brown shrimp are incomplete. [Assoc Press].

Taura Syndrome Control. On Nov. 16, 1995, Immudyne, Inc. announced that Durwood M. Dugger had been appointed Vice President of Aquaculture Development to test, develop, and market ImmuStim(TM), a new treatment strategy to control Taura syndrome virus, which has caused more than \$10 million damage to shrimp farms in South Texas. [Dow Jones news, Immudyne, Inc. press release]

Shrimp Restocking. On Nov. 29, 1995, EcoMar Mariculture, with partial support from Texas A&M University's Sea Grant Program, released about 50,000 juvenile Gulf white shrimp in Galveston Bay in an initial effort to assess whether natural shrimp production can be supplemented through a restocking program.] [personal communication]

AFS Video Production Proposal Correspondent: Editor

The AFS Continuing Education Committee is looking for an AFS group that is interested in undertaking a pilot project to produce and distribute an instructional video that will make a symposium or continuing education workshop available to a wider audience. The video should be interesting to a relatively wide audience, e.g., management offices, research laboratories, or fishery educators who would like to present the material in their classrooms. The sponsoring group would be responsible for choosing a symposium or workshop planned for the 1997 annual meeting, or organize one for 1997, providing up-front funding (\$4-5,000), and selling VHS copies to recover production costs. If you are interested, please contact Bob Carline (814-865-4511) or Mike Hudgins (334-288-1669) for more details.

Aquatic Nuisance Species Digest..... Correspondent: Nils Halke

The ANS Digest is a free publication, funded by the US FWS. Anyone interested in receiving it can contact me by phone, fax, e-mail, or "snail-mail". Its article submission policy is semi-open. At this point, 99% of my articles have been solicited from either scientists or policy types, but I welcome calls from anyone interested in writing for us (so I can discuss topics, format, etc. before they send any manuscripts). Contact: Nils C. Halke, Editor, ANS Digest, Freshwater Foundation, Gray Freshwater Center, 2500 Shadywood Road, Navarre, MN 55339. Phone (612) 471-9773, Fax 471-7685, e-mail frshwtr@freshwater.org.

[This month's issue (Vol 1:(2)) includes interesting articles entitled "Updating the Nonindigenous Species Act, The Challenge of Bio-Pollution, Western States and Provinces Join Forces against Zebra Mussels, A Brief Primer on Zebra Mussels, Nonindigenous Sea Squirts in California Harbors, Chinese Mitten Crabs in North America, The Battle to Control Ruffe in the Great Lakes", and much more. Ed].

HAVE YOU SEEN...?

Proceedings of the Conference and Workshop on Nonindigenous Estuarine & Marine Organisms (NEMO). Seattle, Washington, April 1993. Department of Commerce. EXECUTIVE SUMMARY. The problem of nonindigenous estuarine

marine organism invasions is not a new phenomenon. Marine organisms have been transported around the globe on ships' hulls and in ballast water since the time of the Phoenicians. Only recently has the U.S. turned its attention to the problem as new species appear on our coasts and in our estuaries, causing untold economic and ecological impacts. In the last few years alone Chinese clams (*Polymesoda kumoharui*) have invaded San Francisco Bay, Japanese crabs (*Hemigrapsus sanguineus*) have been found on the New Jersey shores, and European byzoans (*Membranipora membranacea*) have been discovered in the Gulf of Maine. The effects of many of these invasions remains unclear, but ecological changes or economic costs may be associated with them.

The increase in invasions along with their associated economic impacts prompted Congress to pass the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (Public law 101-646, 104 STAT. 4671, 16 U.S.C. 4701-4741 approved Nov. 29, 1990). The Act establishes a task force of federal agencies co-chaired by the National Oceanic and Atmospheric Administration (NOAA) and Fish and Wildlife Service (FWS) to address the growing problem of nonindigenous aquatic nuisance species.

To address the problem of estuarine and marine organisms NOAA sponsored an international workshop. On April 20-22, 1993 NOAA's Office of the Chief Scientist, hosted a international scientific workshop on Nonindigenous Estuarine and Marine Organisms (NEMO). The workshop took place in Seattle, Washington, with sixty participants including representatives from Belgium, Finland, Tasmania, Canada and the Australian mainland. Participants represented the scientific community, State and Federal agencies, non-governmental organizations, and marine industries such as aquaculture, and the aquarium industry. NOAA held the NEMO workshop to focus on the problems of nonindigenous estuarine and marine organisms as most of the emphasis to date has been on zebra mussels and other freshwater nonindigenous organisms. Speakers at the workshop addressed the following four issues:

1. The extent of our understanding of nonindigenous estuarine and marine organisms;
 2. pathways by which exotic organisms are introduced and spread;
 3. research, identification and monitoring, strategies and control;
 4. mitigation and response strategies.
- While the participants did not negotiate a workshop resolution or seek approval of a set of recommendations or conclusions, they did agree on major issues.

In Session 1 titled Presence, Distribution and Effects of Nonindigenous Marine Organisms, the panelists concluded the following points:

- a. Scientists currently underestimate the number and distribution of exotic estuarine and marine organisms in coastal waters throughout the world.

increased the amount of invasives.

- c. Many species which were introduced are frequently misidentified as new species.

In Session II titled , Pathways of Introductions and Dispersal Mechanisms, the panelists concluded that three major pathways currently account for the majority of introductions. The sources are ballast water, the aquarium industry and the aquaculture industry, with most of the attention focused on ballast water. After discussing each industry the panelists concluded the following points:

a. Shipping Industry

- ▶ Every year ships discharge 11,507,700,000 gallons of ballast water into U.S. coastal waters.

- ▶ Scientists have identified over 350 species of estuarine and marine organisms in ballast water, and some post a serious threat to public health and mariculture.

b. Aquarium Industry

- ▶ The aquarium industry currently imports more than 2000 species from more than 30 countries along the equatorial belt.

- ▶ Tank raised species are extremely limited at this time, so industry is dependent upon importing nonindigenous species.

c. Aquaculture Industry

- ▶ In aquaculture marine introductions have been beneficial where the primary objective was the establishment of a fishery or Aquaculture species.

- ▶ Potential adverse risks from these introductions are infectious diseases, replacement of native species, and predator introduction.

In the II Session titled Research - Identification and Monitoring, Strategies and Control the panelists concluded the following points:

a. Possible areas presently available for monitoring and research are NOAA's National Estuarine Research Reserve System and National Marine Sanctuaries.

- ▶ The locations of the sanctuaries and reserves offer unique research

opportunities. These include nearshore, open water, and benthic ecosystems, in temperate and tropical areas.

- b. Currently steps are being taken to mitigate the possibility of introducing new nonindigenous marine organisms with shipments of live mollusks from foreign countries.

- ▶ A memorandum of understanding with the Food and Drug Administration, the exporting country, and the National Marine Fisheries Service has been agreed upon to reduce the risk of introducing undesirable species.

- c. International voluntary guidelines for preventing the introduction of unwanted aquatic organisms and pathogens from ballast water were adopted at the thirty-first session of the Marine Environmental Protection Committee of the International Maritime Organization in July 1991.

- ▶ Guidelines are voluntary but recognize a range of control options including retention of ballast water, ballast water exchange, sediment removal at sea, and discharge into shore reception facilities.

In Session IV title, Mitigation and Response Strategies the panelists concluded the following points:

- a. Once established in estuarine and marine waters, eradication is very difficult.

- ▶ Potential uses for biological control have been identified, but need to be researched and explicitly tested before implemented.

- b. The Islands of Hawaii which currently have over 3000 nonindigenous species, and have had introduction controls since 1955.

- c. Various educational programs presently exist within the public and private sectors.

- ▶ The National Sea Grant College Program and the Cooperative Extension Service have Extension Programs within each state which border on the oceans and Great Lakes of the United States.

CONCLUSIONS. At this time the United States lacks a nonindigenous

estuarine or marine organisms that has caused the significant economic hardships brought on by the zebra mussel. There is now a strong consensus through in the scientific community that it is only a matter of time before one does arrive. Once organisms have become established in estuarine and marine waters, eradication is very difficult. Nonindigenous estuarine and marine organisms are causing ecological change in coastal waters and the magnitude of the distribution of exotic organisms in coastal waters has been greatly underestimated. A more careful and thorough analyses of the taxonomic status of introduced organisms is needed. Participants encouraged Federal and State agencies to include taxonomic analyses in coastal water monitoring programs. The overall consensus was that education of industries, the general public, and scientists holds more promise to prevent new introductions. Education programs should be developed to increase the overall awareness, target specific introductory pathways, and educate the general public on reporting procedures for new sightings of nonindigenous species.

Perspectives in Aquatic Exotic Species Management in the Pacific Islands.
Volume I: Introductions of Commercially Significant Aquatic Organisms to the Pacific Islands. L. G. Eldredge. Pacific Science Association, Honolulu, Hawaii, USA. Inshore Fisheries Research Project Technical Document No. 7. SPREP Reports and Studies Series No. 78. ISSN 1018-3116. South Pacific Commission, Noumea, New Caledonia.

The item is a portion of a very good review of nonindigenous aquatic species introductions to Pacific Islands. This report may not have come to the attention of IFS newsletter readers, since it was published in the western South Pacific (New Caledonia) and was distributed primarily in the central and western Pacific. But is a very good review and deserves some publicity in North America.

Policies, Legislation, and Other Activities Related to Nonindigenous Marine Organisms in the State of Hawaii. Bruce C. Mundy. Honolulu Laboratory, Southwest Fisheries Science Center, National Marine Fisheries Service, 2570 Dole Street, Honolulu, Hawaii 96822-2396.

ABSTRACT In Hawaii, introduced species issues in the marine environment are addressed primarily by state legislation. All importations of organisms into the state must be by permit, and the state can confiscate and illegally imported organisms (Chapter 150, Revised Laws of Hawaii and Act 104, 1991 Session Laws of Hawaii). Authority is delegated to the State Department of Agriculture (HDOA) by Hawaii Administrative Rules Chapter 4-71. Permit requests are reviewed by six HDOA advisory committees consisting of state, federal, and academic representatives. Policies for many species are set by lists specifying conditions for importation including (1) a list of conditionally approved organisms which may be freely imported, (2) a list of restricted organisms which may be imported only under controlled conditions, and (3) a list of prohibited organisms not to be imported for any reason. The release of all nonnative aquatic life into any waters of the state is prohibited, except with an additional permit, by Act 256 of 1993. Unintentional introductions are addressed only by empowerment of HDOA to inspect and confiscate organisms without permits. Resolutions specifically directed toward

unintentional introductions of marine organisms were introduced in the state legislature in 1993.

Federal responsibilities exist for the U.S. Fish and Wildlife Service and National Marine Fisheries Service under the Lacey, Injurious Species, and Endangered Species Acts. The Federal Alien Species Prevention and Enforcement Act of 1992 allows inspection of mail and confiscation of illegally shipped organisms but conflicts with privacy rights of the U.S. mail. Other federal activities consist of review of environmental documents, including impact statements, and participation in state advisory committees.

Educational programs to inform the public of dangers from introduced species include lectures by Hawaii Department of Land and Natural Resources staff and television campaigns. Although they emphasize freshwater and terrestrial habitats, these should increase public awareness about the dangers to all ecosystems. There is clearly a need for increased public awareness about the risks from introductions of nonindigenous marine species in the State of Hawaii.

MUSSEL WATCH

Sea Grant Zebra Mussel Report: An Update of Research and Outreach. Ohio Sea Grant Program, The Ohio State University. February, 1995. Contact: Nancy Cruickshank, 614-292-8949.

Zebra Mussels in Louisiana at the Southern Edge of Its Range
..... Correspondent: Bruce A. Thompson
There have been numerous predictions concerning the dispersal patterns and rates of zebra mussel infestation as it expands outside the Great Lakes. Most early hypotheses were that the high summer water temperatures in the southern United States would provide high enough mortality to prevent permanent colonization of southern states. Unfortunately, the presence of zebra mussels in the Mississippi River as far south as the "bird's-foot" delta near the Gulf of Mexico and large over-summering of all life history stages the past several years suggest that earlier assumptions about the species warmwater intolerance need re-examination.

As part of a research program examining life history, distribution, and habitat in Louisiana, documentation of dozens of zebra mussel records from water, power, and chemical plants, navigation structures, commercial barges, freshwater unionid clams, trees in flooded oxbow lakes, as well as rip-rap and shoreline stabilization mats, and aquatic vegetation indicate that zebra mussels are now a permanent and significant member of Louisiana's Mississippi River fauna.

"Major water pest surfaces in California" (by Rae Tyson)

..... Correspondent: Denny Lassus
The Zebra Mussel (ZM), a foreign invader in the Great Lakes (GL) and other eastern waters, has been spotted in CA. "This is a major, major pest" says Myrlis Hollis of CA Dept. of Food and Agriculture. An inspection station at Truckee found ZM on 5 boats from GL states. ZM have not been found in CA waters yet, but if it was, "officials say the mollusk could cause significant damage by clogging the

State's water distribution system (ventils, gates, pipelines, etc.) established, the impact of Water Resources was quoted as saying "If they become two new invaders, also via would be severe". ... Meanwhile, GL officials confirm two new invaders, also via ballast water: ruffe in Superior (cited greater than \$100M losses possible to the commercial fishing industry unless controlled and quotes Minnesota Sea Grant's Doug Jensen as noting the ruffe populations have "exploded") and round goby (St. Claire River near Detroit about four years ago, now to Erie and Michigan and quotes the Center for Great Lakes and Aquatic Sciences researcher David Jude as noting "we're concerned about the impact on native species because huge populations have developed at all these sites"). The goby and ruffe are native to the Caspian and Black Seas. The spread of ZM is recounted and the types of systems in which it has caused problems are noted, but the article also quotes Jude as saying "Unfortunately, it's a little late. The barn door is already open." This may be an old story to IFS members, but its appearance in USA Today exemplifies the higher profile introduced species issues are getting. This notoriety presents a real opportunity for outreach and increased understanding of the issue -- and, just maybe, increased support for research and management measures. [From USA Today (Sept. 12, 1995)]

Zebra Mussels May Threaten California Irrigation System (by Tom Kenworthy)

Correspondent: Eric Hallerman
Government scientists are warning that a European freshwater mussel that has caused hundreds of millions of dollars in economic losses in the midwestern and eastern United States is capable of spreading to California's vast agricultural irrigation system.

Twice within the past nine months, during state border check-point inspections, live zebra mussels have been found attached to the water intakes of yachts being transported from the Great Lakes to California. Officials with the National Biological Service--an agency of the Interior Department that is struggling to justify its mission to a Congress intent on slashing its budget--said the discoveries demonstrate the ability of the mussel to invade California waters....

Since November 1993, agricultural inspectors at California border stations have found live or dead zebra mussels attached to a half-dozen boats arriving by truck from the Midwest. [From Washington Post (Aug. 22, 1995)]

Zebra Mussel Task Force Notifies KS Legislature

Correspondent Larry Zuckerman

The Kansas Zebra Mussel Task Force -- a coalition of state, federal, and local government, utility companies, private industry, and environmental nonprofit organizations -- has taken the pro-active approach of informing the State's Senators and Representatives during their annual wrap-up session of the perils of the exotic zebra mussels. The letter and brochures alert the lawmakers of potential ecological and economic disaster if the foreign invertebrates reach Kansas' inland waters. The Task Force, unlike its neighbors in Oklahoma, Arkansas, Missouri, and Iowa, enjoys the luxury of concentrating its energy on public education for prevention of introductions and for monitoring Kansas waters; and not on the elimination of these exotic mussels. Continued vigilance plus boat washing stations and education campaigns may forestall the extension of zebra mussels into Kansas.

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SECRETARY-TREASURER'S APOLOGY

What does a swollen jaw have to do with printing a very late newsletter? This is not a riddle and not very funny -- as any of you that have experienced the pain of oral surgery can testify. Four impacted wisdom teeth and a hunk of jaw bone later, I am out of most of the pain, off the legal pharmaceuticals, and back at work -- after a period that seems like years. Sorry this newsletter is arriving so late... the next one will be much more timely. Special thanks and apologies to our illustrious editor, Don Baltz -- who toiled hard on this newsletter and had to wait forever to see it in his mailbox -- and to our president, Neal Foster -- who tried so hard to get you involved in our upcoming symposium.