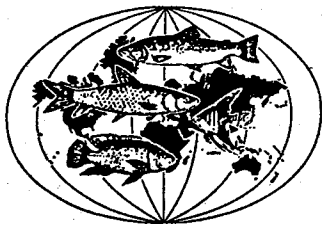

NEWSLETTER

of the Introduced Fish Section,
American Fisheries Society

November 1987 Peter B. Moyle, Editor Volume 7, Number 4

FROM THE PRESIDENT

Greetings to all members of the Introduced Fish Section. I consider it both a pleasure and an honor to be able to work with you and the elected officers of this Section. I will strive to serve the needs of Section members to promote the interest of the Section and to present your interest to the Society through the AFS EXCOM. Officers of the Section can only represent your interest to the extent that your concerns are made known. While I await your communications, I will offer a few of my own concerns.

A recent survey conducted by the Membership Concerns Committee and the Long Range Planning Committee indicated that few members of the American Fisheries Society become actively involved with their professional organization. The majority (65%) of members were "satisfied" or "somewhat satisfied" with the publications and journals of the Society. Fisheries was received by 96.5% of the members, Transactions of the American Fisheries Society by 71.7%, North American Journal of Fisheries Management by 57.2%, and the Progressive Fish-Culturist by 43.6% of the members. For many members the publications may be their strongest or perhaps only link with the Society.

Many members never attend chapter (22.4%), section (55.8%), division (46.6%) or parent society (44.9%) meetings. Among members that usually attended meetings, most attended chapter meetings (39.7%), whereas far fewer attended section (4.7%), division (6.8%), or parent society (5.7%) meetings. Few of the Society's members have ever held office at the chapter (14.3%), section (13.3%), division (4.1%), or parent society (6.5%) level. Similarly, few have served on committees of the chapter (16.6%), section (11.1%), divisions (8.8%), or parent society.

From the above I conclude that publications are very important to members and expect that the Newsletter is very important to Section members. Past-President Jim Clugston took action to increase the involvement of members by appointing regional Newsletter representatives. I reappointed those same members, but would like to add other representatives to achieve an even broader coverage. If you wish to represent your part of the world, your agency, institute, or university, please contact me or Newsletter editor Peter Moyle. (If you don't contact me, I may call you!)

I would also appreciate volunteers willing to serve on the Membership Committee to develop a Section brochure, to identify topics for future symposia, and to plan and organize workshops or symposia dealing with any aspect of introduced fishes. Let's get active.

The American Fisheries Society is our professional Society. The Introduced Fish Section is our special interest Section. Let's get active and make them the best.

--Nick C. Parker

MINUTES OF THE ANNUAL MEETING, 16 SEPTEMBER 1987

President James Clugston called the Eighth Annual Business Meeting of the Introduced Fish Section (IFS) to order at 1510 h, 16 September 1987, in Winston-Salem, North Carolina. President Clugston reiterated his interest in IFS and encouraged others to become more actively involved. In order to increase participation, he listed three specific actions that he had initiated during his term in office: (1) appointment of six regional Newsletter representatives (see last page of Newsletter for names and addresses; they need your input), (2) initiated plans for a symposium on quantitative effects of introduced fishes to be held at the 1988 meetings, and (3) encouraged expansion and regular mailings of our Newsletter.

A motion to accept the minutes of the Seventh Annual IFS Business Meeting as printed in our Newsletter 7(1):2-3 was approved, as was the Treasurer's Report which showed a balance of $761.28 as of 8 September 1987.

Membership Committee Chairman Al Zale asked several former IFS members why they had not renewed their memberships. These people responded that they had joined expecting our Newsletter to contain more practical information, as well as additional sources of information on introduced fishes that would be of immediate interest and value. These people felt that the Newsletter had occasionally become cluttered with too much internal operating information that was of little interest. Al also reported that IFS currently had 192 members and that prior to 1 January 1988 would need to get at least 8 more members to maintain our voting status on the AFS EXCOM. Several ideas were then discussed on how to enlist and retain members. These included establishing liaisons with other sections, a membership flyer, and an article in Fisheries. Al was recognized and thanked for the time and effort he has put into Membership Committee activities.

Bob Wattendorf, Nominating Committee Chairman, reported that Nick Parker was affirmed as the next IFS President along with Peter Moyle, President-Elect, and Paul Shafland, Secretary-Treasurer.

A resolution recommending delay of the purposeful introduction of the Zander in North Dakota was read for informational purposes. This resolution subsequently passed at the AFS parent society's business meeting.

Lynn Starnes and Bob Peoples (USFWS) informed IFS that the U.S. Fish and Wildlife Service was in the early stages of developing a national policy for introduced aquatic species. Lynn recently (14 Sept 1987) presented the concept at the Inland Fisheries Committee Meeting of the International Association of Fish and Wildlife Agencies and is now awaiting their response. As now envisioned, this policy would take one or more of the following forms: (1) clean/dirty species lists, (2) mandated federal standards, (3) a universally applied protocol for evaluating purposeful introductions, and (4) a model code instituted at the state level, similar to the way building codes are enforced nationwide. Persons interested in more information can contact Lynn or Bob in D.C.

Section members voiced their support for the Section to sponsor a symposium at next year's annual AFS meeting. This symposium will be co-chaired by Jim Clugston and Paul Shafland and has the tentative working title: "Quantitative Socio-Economic and Biological Effects of Introduced Fishes and Their Statistical Associations with Other Fishes and the Environment." The reason for the lengthy title is to cover as many aspects of introduced fish as possible and to then revise the title depending on the input received. Furthermore, the symposium will seek to expand the generally recognized IFS scope by seeking presentations involving transplants (e.g., salmonids, esocids and Morones) as well as those involving exotics. Hopefully this approach will also gain IFS some new members, many of whom continue to think we are the "Exotic" Fish Section.

The "imaginary" gavel was transferred from outgoing IFS President Jim Clugston to our new President Nick Parker. President Parker's first order of business was to recognize and thank Jim Clugston for his work on behalf of IFS, after which Jim was presented with the Section's Past-President Plaque.

In his presidential remarks, Nick addressed membership concerns both from the standpoint of numbers and level of member participation. One relevant statistic he reported was that only 8 to 10% of all AFS members are involved in AFS Sections. Thus, most potential new IFS members are already AFS members and all of us should be able to persuade some of these to join IFS.

President Parker also mentioned: (1) the possibility of sending out Section Newsletters on a biweekly basis via a joint effort with the parent society, (2) Mississippi's short-lived rule based on the "Dirty Fish List" concept, and (3) the increasing world-wide interest in the Nile Perch introduction into Lake Victoria, Africa. President Parker concluded his remarks with a plea for Section members to provide him with advice concerning future Section directions and activities.

Individuals attending this year's IFS Business Meeting were Gary Carmichael, Jim Clugston, Nick Parker, Bob Peoples, and Lynn Starnes (USFWS); David Philipp and Julie Claussen (Illinois Natural History Survey); Paul Shafland and Bob Wattendorf (Florida Game-Fish Commission); Todd Beck (Pennsylvania Power and Light); Bill Shelton (University of Oklahoma); and Al Zale (Oklahoma State University).

The Business Meeting was adjourned at 1645 h.

--Submitted by Paul L. Shafland, Secretary-Treasurer

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from The New Yorker, July 27, 1987

"Frankly, I think we'll regret introducing these organisms into the environment."

ALDO LEOPOLD STRIKES AGAIN

"Exotic wildlife . . . has served as a perfect alibi for postponing the practice of game management." Aldo Leopold. 1938. "Chukaremia," Outdoor America 3, p. 3.

Or, stated another way, "Importations are an admission of defeat in managing native populations to meet existing needs." R. H. Giles Jr. 1978. Wildlife Management. W. H. Freeman Co., San Francisco. p. 36.

--Deepest thanks to Hiram ("Frankenstein effect") Li for providing these quotes.

FROM THE EDITOR

If you are tired of seeing a newsletter devoted in good part to exhortations by the president (noble though they may be) and minutes of lightly attended meetings, I suggest you send me something interesting to print. Get on your soapbox and shake your fist (fish?) at stupid bureaucrats and thick-headed professors who don't understand what the real problems are. Write an editorial on an action, policy, or fish that irritates you or pleases you. We will print anything that is not obscene or libelous, is of reasonable length, and is written in understandable prose. Even jokes would be appreciated. How about some poetry? Even rhymed couplets and iambic pentameter would be acceptable. This is YOUR newsletter. It will be as boring or as interesting as you want it to be.

--Peter B. Moyle

SCOPE THIS OUT!

For the past several years, the international organization SCOPE (Scientific Committee on Problems of the Environment) has been holding symposia on the effects of introduced species under the general title of "Ecology of Biological Invasions." These symposia have been extraordinarily successful at getting leading ecologists to address the applied and theoretical problems associated with biological invasions. Looking through the literature is a humbling experience, as the problems we have with introduced fishes are only a small part of the picture of disastrous effects of introduced species. The volumes listed below are filled with challenging papers on the ecology of introductions; some even discuss fish. Most of the information is directly or indirectly applicable to understanding the problems we face with fishes.

Gray, A. J., Crawley, M. J. & Edwards, P. J. (eds). 1987. Colonization, succession and stability. Symp. Br. Ecol. Soc. No. 26. Oxford: Blackwell.

Groves, R. H. & Burdon, J. J. (eds). 1986. The ecology of biological invasions: an Australian perspective. Cambridge University Press.

Kornberg, H. & Williamson, M. H. (eds). 1986. Quantitative aspects of the ecology of biological invasions. Philos. Trans. R. Soc. Lond. B314:501-742.

Macdonald, I. A. W., Kruger, F. J. & Ferrar, A. A. (eds). 1986. The ecology and management of biological invasions in southern Africa. Cape Town: Oxford University Press.

Mooney, H. A. & Drake, J. A. (eds). 1986 Ecology of Biological Invasions of North America and Hawaii. New York: Springer-Verlag.

RECENT PUBLICATIONS OF INTEREST

1. Courtenay, W. J. Jr. and J. N. Taylor. 1984. The exotic ichthyofauna of the contiguous United States with preliminary observations on intranational transplants. Pages 466-487 in Documents Presented at the Symposium on Stock Enhancement in the Management of Freshwater Fisheries. FAO EIFAC Tech. Pap./Doc. Tech. CECPI 42, Suppl. Vol. 2.

2. Herbold, B. and P. B. Moyle 1986. Introduced species and vacant niches. Amer. Nat. 128:751-760.

3. Moyle, P. B. 1986. Fish introductions into North America: patterns and ecological impact. Pages 27-43 in H. A. Mooney and J. A. Drake, eds., Ecology of Biological Invasions of North America and Hawaii. Springer-Verlag, N.Y.

4. Moyle, P. B., H. W. Li, and B. A. Barton. 1987. The Frankenstein effect: impact of introduced fishes on native fishes in North America. Pages 415-426 in R. Stroud, ed., Fish Culture in Fisheries Management. Amer. Fish. Soc., Bethesda, MD.

5. Courtenay, W. R. Jr., D. A. Hensley, J. N. Taylor, and J. A. McCann. 1986. Distribution of exotic fishes in North America. Pages 675-698 in C. H. Hocutt and E. O. Wiley, eds., Zoogeography of North American Freshwater Fishes. John Wiley & Sons, New York, NY.

6. Pimm, S. L. 1987. Determining the effects of introduced species. Trends in ecology and evolution 2(4):106-108.

The book cited in #3 contains a number of general papers by prominent ecologists (Ehrlich, Simberloff, Orians, Vitousek, Roughgarden, May, Pimm, etc.) that are worth reading. The book cited in #1 contains mainly descriptive accounts of fish introductions in Europe, but also contains a couple of general papers, the most useful being one by R. A. Ryder and S. R. Kerr on risk assessment of introductions. Another book that contains a great deal of useful information and ideas is, of course: W. J. Courtenay and J. R. Stauffer, eds. 1984. Distribution, Biology, and Management of Exotic Fishes. Johns Hopkins University Press, Baltimore.

ASIH SYMPOSIUM ON INTRODUCED SPECIES

"Introduced species in natural systems" was the subject of a symposium organized by Peter Moyle and Walt Courtenay for the annual meeting of the American Society of Ichthyologists and Herpetologists, June 24, 1987. The symposium was only lightly attended, which was unfortunate, as the papers were excellent and the message was clear: introduced species are having major effects on aquatic ecosystems throughout North America, but these effects are often not recognized or appreciated. Biologists purporting to be studying the ecology of fishes in natural systems need to know which components of the system they are studying are native. In some regions, cryptic introduced species are common; these are species that seem to be native to a system but

have been introduced from nearby drainages by persons unknown. There are no plans to publish the symposium, but a number of the papers should appear in print in regular journals. Meanwhile, I will reprint some of the abstracts in this and subsequent issues of the Newsletter.

ABSTRACT: INTRODUCED FISHES IN VIRGINIA DRAINAGES, WITH SPECIAL REFERENCE TO CRYPTIC INTRODUCTIONS AND BIOGEOGRAPHIC STUDY. R. E. Jenkins, Department of Biology, Roanoke College, Salem, VA 24153.

A data base of the drainage-occurrence status of 234 species (254 taxa) in all major drainages of Virginia, including extralimital portions, was analyzed. Sixty-six species (26% of the taxa) have been introduced or transplanted to at least one drainage. Some 249 (21.4%) of the 1162 drainage occurrences were judged to be due to introduction. The new drainage, rich with endemics but depauperate in natives compared with regional faunas, is a haven for introduced species, these comprising 48% of its 87 fishes. In the 11 other drainages, 11.9 to 32.2% of the taxa were introduced.

Of the 66 introduced species, 32 are game/food fishes, 5 are forage species, 2 are ornamentals, and 1 is used for plant control. The remaining 26, comprising minnows, suckers, madtoms and darters, apparently had been cryptically introduced via bait pails and other means. Criteria for determining distributional status (native/introduced) are given. As a measure of the resultant uncertainty of the 249 drainage occurrences deemed to be due to introduction, at least 65 are probable rather than documented or obvious introductions. Of the 913 occurrences regarded as native, 34 quite possibly stem from introduction. Thus 99 (8.5%) of all drainage occurrences are questionably native or introduced. Often the species involved furnish key evidence for stream capture or range constriction; therefore, misinterpretation of distributional status can subvert biogeographic study.

Most introductions apparently occurred in the last 30 years and were only recently detected. Few native fishes are suspected of being adversely impacted, but careful study or time may show otherwise.

Editor's comment: This study is an example of how careful analysis of distributional records can lead to some startling conclusions about the naturalness of local fish communities. The following abstract is of a study that shows that fish communities containing a high percentage of introduced species are more likely to be unstable and hence harder to manage than communities of coevolved native species.

ABSTRACT: INTRODUCED FISHES IN ESTUARIES. Bruce Herbold, Department of Wildlife and Fisheries Biology, University of California, Davis, CA 95616.

The ichthyofauna of the Sacramento-San Joaquin estuary is unusual in that it is dominated by introduced species. Suisun Marsh is one of the least modified habitats in the area. Native fishes, rare in other parts of the delta, are found in upper reaches of the sloughs which traverse the marsh. Introduced species are more widely distributed and are frequently found in the larger, dredged sloughs. Diets of all fishes include a seasonally abundant mysid, and when this item is scarce most fish are less full. Three of the resident native fishes each consume a different alternative food and the decline in fullness is not significant. The introduced resident species all show a decline in fullness and eat a significantly more diverse diet. Reproductive success of both native and resident species is tied to outflow. However, among the resident fishes of Suisun Marsh the fluctuations among native species are much more concordant than among the suite of introduced species. Many of the general patterns of species abundance in Suisun Marsh are similar to those reported for estuaries without introduced fishes.

ABSTRACT: SPECIES INTRODUCTIONS IN NORTHERN WISCONSIN LAKES: WHY DO CERTAIN INVASIONS HAVE SUCH LARGE EFFECTS? Ann McLain and John J. Magnuson, Center for Limnology, University of Wisconsin, Madison, WI.

A species list of Wisconsin fishes has proportionally few exotics, but on a local scale the introduction of new fishes into lake communities has been a common event. These introductions range from bait bucket introductions and accidental releases from fishing gear to fish rescue operations and the full-scale stocking efforts of private landowners and the state management agency. We considered some specific examples from Northern Wisconsin lakes. Some of these events produced transitory populations that appeared to have little or no long-term effect on the community. More lasting effects result when the new species replaced a native species. Still other colonization events resulted in the transformation of the host community. We speculate that the fish species in our examples have particular characteristics that permit us to predict the outcome of similar colonization events.

ABSTRACT: INTERACTIONS AMONG INTRODUCED STRIPED BASS AND NATIVE BLACK BASS SPECIES IN LAKE TEXOMA (OKLAHOMA-TEXAS). William J. Matthews, Frances P. Gelwick, and Bret C. Harvey. University of Oklahoma Biological Station, Kingston, OK 73439.

Since the 1960's, striped bass (Morone saxatilis) have been introduced into many of the freshwater reservoirs of the southern and eastern United States, including Lake Texoma (Oklahoma-Texas).

Since original stockings of fingerlings in 1969, striped bass have established a reproducing population in Lake Texoma, and the fishery is now maintained wholly by recruitment from natural spawning. The addition of striped bass to reservoirs does not in the narrow sense comprise introduction of a species to a "natural system," but in many cases striped bass were introduced into fish assemblages that had coexisted in reservoirs for many years. Fishermen and biologists alike expressed concern about the impact of striped bass upon existing fish assemblages, with curiosity focused on potential interactions between striped bass and pre-existing predators, most often black basses (Micropterus spp.). Much speculation was forthcoming, but most concerns focused on the possibility that (1) striped bass would eat black bass, or (2) striped bass would compete with Micropterus species for available food resources. Since 1981 we have examined more than 1800 stomachs from striped bass collected from Lake Texoma. They do not eat black bass. Adult striped bass feed heavily upon shad (Dorosoma spp.) which also comprise much of the food of adult and sub-adult black bass. However, adult black bass in Lake Texoma consume a much wider range of foods than striped bass. Adult black bass and striped bass also occupy somewhat different, though overlapping, habitats within the reservoir. Juvenile striped bass and black bass both occupy littoral habitats, but different kinds of localities. Diets of juvenile striped and black basses in Lake Texoma are also substantially different from each other in the wild, and feeding experiments under controlled environments confirm that there is substantial separation in diet among juveniles of these species.

ABSTRACT: THE DECLINING NATIVE FISH FAUNA OF THE AMERICAN SOUTHWEST AND THE DILEMMA OF INTRODUCED SPECIES. E. P. Pister, California Department of Fish and Game, Bishop, CA 93514.

The native fish fauna of the American Southwest has been heavily impacted by burgeoning human populations which caused major disruption of natural habitats and the widespread introduction of nonnative species. In California, more than 90 percent of historic wetland habitats have been lost which combined with the introduction of predaceous and competitive nonnative fishes caused the total extinction of the thicktail chub (Gila crassicauda) and the drastic reduction of California's only native sunfish, the Sacramento perch (Archoplites interruptus), throughout most of its historic range in the great Central Valley. An invasion of brown trout (Salmo trutta) into the upper reaches of the Kern Plateau nearly extirpated the native golden trout (Salmo aguabonita) from the majority of its range. Twenty years later, efforts are still in progress to return the South Fork Kern River to a natural fish fauna. Among 20 fishes native to the California desert, only seven remain numerous, whereas six are endangered and seven are extinct. No doubt the presence of 52 nonnative species has been a major cause of the status quo.

Editor's note: Phil Pister is an extremely unusual member of our sacred order of fisheries biologists: he actually demands that we examine the ethics of our actions and think of their long-term consequences. He should consequently either be excommunicated or raised to the level of saint. I favor the latter action, but suggest you make up your own mind by reading one of his essays or by inviting him to speak to your organization!

INTRODUCED FISH SECTION SYMPOSIUM!!!!

In case you have not heard or read the minutes, YOUR section is sponsoring a symposium at the next AFS meeting with the imposing title of "QUANTITATIVE SOCIO-ECONOMIC AND BIOLOGICAL EFFECTS OF INTRODUCED FISHES AND THEIR STATISTICAL ASSOCIATIONS WITH OTHER FISHES AND THE ENVIRONMENT." It is being organized by past-president Jim Klugston (USFWS, Fisheries Research Center, 7920 NW 71st St., Gainesville FL 32606) and Paul Shafland, our secretary-treasurer. They are looking for participants with data on the effects of introduced species. It is getting late (the official deadline for response was 21 October) so tell either organizer as soon as possible if you are interested in presenting a paper.

GREAT LAKES INTRODUCTIONS

The Great Lakes Fishery Commission's Committee on Management of Introductions in the Great Lakes Basin met in Ann Arbor, Michigan, on October 27-28 to develop plans for a workshop. The meeting was chaired by Margaret Dochoda and attended by Michael Donahue, Rodney Horner, Steven Nepszy, Ken Paxton, and Jon Stanley. The committee plans to develop a basinwide policy statement that relates introductions to fish community goals and an ecosystems approach to resource management. The group will attempt to formulate a Model Program with a code of behavior and consultation procedures for agencies, academia, and private aquaculture. The committee recommends that documents be produced prior to the workshop that analyze the sources and impacts of fish and disease introductions to the Great Lakes and that review existing regulations and laws. For more information write: Margaret Dochada, Great Lakes Fishery Commission, 1451 Green Road, Ann Arbor, MI 48105.

--Jan G. Stanley

NEWS ITEMS

The following three items were submitted by John Dentler, our official West Coast Newsletter representative. They are good examples of items that can help to make our newsletter more interesting. If you are not inspired to write up an item you think would be of interest to members, please send the information to your own representative (addresses at end of newsletter) or to the editor. We will see that it gets into print with appropriate acknowledgement.

STATE SEZ KILL THOSE HONKEY BASS

On October 7, 1987, the California Supreme Court cleared the way for the California State Fish and Game Department to poison white bass (Morone chrysops) in a San Joaquin Valley reservoir and two river systems flowing through Tulare and Kings counties. CF&G Department will begin efforts to use the pesticide rotenone to rid the San Joaquin [whooakeen] River System of the illegally introduced and voracious white bass. The white bass pose a threat to the acquatic ecosystem of the San Joaquin River delta 200 miles to the north.

FRESH RECORD OF FLESH EATER

This summer, a piranha was found in the San Joaquin River in western Fresno county. According to newspaper reports (L.A. Times), only one fish was found and it was a large healthy adult. Stomach contents were crayfish, plants, and rubber-bands! Further sampling apparently revealed no further piranhas.

Editor's note: a recent study by I. Sazima and S. de Andrade Guimaraes, 1983 (Environmental Biology of Fishes 20:75-77), indicates that most records of piranhas preying on people are poorly documented and probably represent cases of the fish scavenging on drowning victims.

EXOTIC CLAM CLOUDS WATER

According to Clean Water Report, an increasingly common and costly problem for the nation's water systems is the non-native Asiatic clam, Corbicula spp. The tiny clams have infested water systems and pipes in at least 35 states, wreaking havoc on everything from nuclear power plants to golf courses "at a cost of more than a billion dollars a year."

By increasing the level of organic material in the water, they help to produce trihalomethanes (THMs), a group of chemicals considered a potential health hazard in drinking water. The major constituent of concern is chloroform (an animal carcinogen) that is formed when water utilities apply chlorine or its derivatives to disinfect drinking water. The U.S. EPA recently issued regulations reducing allowable THM concentrations in drinking water. According to the article in Clean Water Report, "Power plant damage from the clams was first reported in 1961 and in 1980 the Arkansas Nuclear One Power Plant was shut down because the clams were clogging the reactor's internal cooling pipes. Recently, problems with the clams have also been reported in Europe. Normal control methods, a combination of chlorine treatments and regular maintenance of pipes, have not been successful in slowing their growth." Water utilities are now using chloramine rather than chlorine to cope with the THM problem.

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