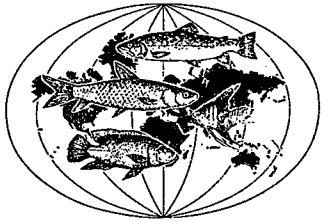


NEWSLETTER

of the Introduced Fish Section,
American Fisheries Society

March 1988 Peter B. Moyle, Editor Volume 8, Number 1

## FROM THE PRESIDENT

Greetings once again to members of the Introduced Fish Section. Our Section has members with very diverse interests and points of view as they relate to introduced fish. Based on a 1987 survey of members in the Section, some view essentially all introduced fish as potentially harmful or very harmful to native stocks; others indicate that the positive benefits far outweigh the potential risks.

Without taking sides with either group, I am convinced that introduced fish, including exotic species, will become much more widespread throughout this country; the driving force will be economics. Look at some of the statistics relating to recreational and commercial fisheries and to the emerging giant--aquaculture.

United States commercial fishermen catch 4 billion kg of edible and industrial fish annually worth $2.6 billion dockside, with a final value in excess of $6.2 billion. Commercial fishing generates 85,000 full-time jobs and 110,000 seasonal jobs. Supporting industries employ 300,000. More than 126,000 vessels are utilized and fishing products are handled in 3,600 shore establishments. In 1985, 64 million Americans enjoyed recreational fishing in coastal and inland waters. Sport fishing activities generated $28.1 billion in retail sales and created more than 590,000 jobs. Of this total, $10 billion was generated by marine recreational fishing and the remainder by freshwater sport fishing.

On a global basis, aquaculture now produces 11% of all fishery products and this percentage is soon expected to increase to 25%. The demand for fishery products is unrelenting due to the growing demand for seafood and for recreational opportunities. Imports of fishery products to the United States increased at an annual rate of $278 million per year from 1960 through 1986, by which time they were valued at $7.6 billion. The annual per capita consumption of fish increased more than 20% from 1975 to 1986. In 1986 the per capita consumption reached 6.7 kg per year and it is projected to be 13.6 kg by 2020. From where will these fish come?



The world's catch of fish in millions of metric tons was 27 million in 1975, 74 million in 1976, and 90 million in 1986. The catch increased because previously unused resources ("trash fish") were captured and processed into consumer-acceptable forms. Some estimates place the maximum sustainable yield from the ocean to be 100 to 120 million metric tons per year.

As the demand for fishery products increases, it will stimulate aquaculturists to produce farm-raised fish for both food and recreation. In 1987 approximately 182,000 metric tons of farm-raised catfish and 23,000 metric tons of farm-raised trout were processed as food fish in the United States. The production of Atlantic salmon is rapidly expanding on both coasts. Commercial landings from the Atlantic ocean were only about 10,000 metric tons, but 50,000 metric tons were imported into the United States and 150,000 metric tons of Atlantic salmon were reared in Norway, Sweden, Iceland, and Japan.

On the recreational side, farm-raised fish are increasingly being used for sport fishing in privately owned lakes. At least one aquaculturist in Texas is routinely selling 1-day fishing rights for $90 to $165 per fisherman and has received $900 per day when fishermen were guaranteed a trophy-size bass of 3 kg or larger.

With these pressures on our natural resources, the demand for recreational and food fish will create new markets for introduced species throughout the nation. I foresee a ready market for reproductively sterile fish, for a multitude of hybrids, and for trophy-size fish produced by ploidy manipulation and with gene insertion techniques. Introduced fish will undoubtedly become more widespread and offer new opportunities and challenges to resource managers, recreational fishermen, and aquaculturists. The Introduced Fish Section can be instrumental in future developments and is now doing so through development of symposia, workshops, and meetings. The session prepared for the 1988 AFS Annual Meeting in Toronto will address the "Quantitative Effects of Introduced Fishes." Other symposia being considered include one on smallmouth bass. The Section will respond to the extent that members support the Section. Invite a new member and get active! Let me hear from you.

--Nick C. Parker

## FROM THE EDITOR

I agree with Nick that introduced fishes will become much more widespread and will represent continuous new management challenges. Unfortunately, a majority of these "challenges" will be unplanned as fisheries managers try to counteract the effects of unauthorized introductions. Modern transportation systems and the sophisticated means of keeping fish alive now available to anglers are resulting in frequent transplants by well-meaning but ill-informed people. Fish are also being moved around by aquarists, especially those with an interest in North American fishes. Obviously one of our needs is for better education of fish users. Suggestions for such programs would make good items for this newsletter!

## BASS, GRASS CARP AND HYDRILLA

The following item is condensed from Aquaphyte 7(2), 1987, the newsletter of the Center for Aquatic Plants, University of Florida.

Many fishermen believe good bass fishing lakes require the presence of submersed plants. However,...for more than 7 years [two Florida] lakes have been devoid of submersed plants, yet largemouth bass populations are at the same or higher levels now than when submersed plants were plentiful.

In the late 1970s, Lakes Baldwin and Pearl had 70% and 95% hydrilla cover, respectively. Grass carp were released into the lakes at 13 and 17 fish per acre. By the early 1980s, no submersed plants remained in either lake. The grass carp remain and continue to remove submersed vegetation as it re-appears.

Some results:

* Radiotelemetry studies of largemouth bass movement shows that 40% of the adults spend the majority of their time in the middle, deeper parts of the lakes, instead of near the shores.

* As hydrilla was consumed by grass carp, there were immediate, significant decreases in non-game fish species such as chubsuckers, blue-spotted sunfish, golden shiners and goldentop minnows. These fish populations have not recovered.

* Blue-gill and redear sunfish populations have remained constant or have increased since introduction of grass carp.

* Bass populations were not impacted by grass carp introduction or submersed plant elimination because the bass forage base (bluegills, redear) remained intact.

* The food bases in the lakes shifted from insects and zooplankton which are dependent on vegetation, to insects which do not require vegetation. The latter insects were always present, but are now dominant.

* Water clarity in the lakes changed from six meter Secchi depth to one and a half meter Sechhi depth.

For more information contact Douglas Colle at Department of Fisheries and Aquaculture, IFAS - University of Florida, 7922 N.W. 71st Street, Gainesville, FL 32606. (904) 392-9613.

## PACUS IN TEXAS

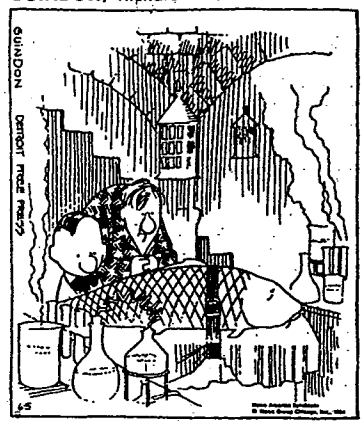
During 1987, a number of pacus (Colossoma) were taken in Texas waters including: a) a 280 mm specimen from Lake Lavon near Dallas in June, b) another from Lake Bastrop near Austin, c) one from the Colorado River near Bastrop - apparently C. bidens-type, and an approximately 450 mm C.nigripinnis-type from Eagle point near Houston in about 12 ppt



salinity. All were taken by anglers fishing with minnows or worms. A fish reported by an angler to be a piranha was hooked but lost in the Guadalupe River near Kerrville. Although pacus have previously been reported from Texas waters in the past, the number of specimens seen in 1987 is exceptional. Large numbers of juvenile pacus (50-80 mm) were seen in pet stores around the state about a year and a half earlier. It is likely that some of these field-collected specimens originated from these pet trade importations.

--Bob Howells

**GUINDON/** Richard Guindon




Young Frankenstein's first creation was so bizarre that he threw it in a nearby river.

## RESEARCH IN TEXAS, NEW MEXICO, ARIZONA

At Texas Parks and Wildlife Department's Heart of the Hills Research Station: a) Dick Luebke reported an angler catch of a 250 mm oscar Astronotus ocellatus from Victor Braunig Reservoir near San Antonio, apparently an isolated aquarium release, b) Maurice Mouneke is completing a review of tilapia status in Texas waters, c) Gary Garrett is beginning an evaluation of endemic Guadalupe bass status to determine the extent of contamination from smallmouth bass introductions, d) electrophoretic analysis of hybrid orangemouth corvina x spotted seatrout in Calaveras Reservoir and of a white morph of (apparently) blue talapia from a commercial breeder is being performed by Bob Howells, and 3) John Prentice has presented several papers on the culture of orangemouth corvina imported to Texas from California.

In New Mexico, controlled research on grass carp is in progress, as is expansion of striped bass and kokanee salmon introduction programs.

In Arizona, the impact of introduced species including centrarchids and flathead catfish on native minnows and suckers is a special concern. One vexed researcher expressed a desire for a pathogen that would eliminate largemouth bass!

--Bob Howells

## EXOTIC FISHES IN ASIA

The Asian Fisheries Society is planning a workshop on exotic aquatic species in Asia to (1) document extent of introductions, (2) assess their impact, and (3) discuss the establishment of guidelines for the transfer and introduction of species in the region. If you are interested, contact Professor Sena S. De Silva, Department of Zoology, University of Ruhuna, Matada, Sri Lanka.

The Indian Branch of the Asian Fisheries Society is organizing a special workshop on exotic aquatic species in India on 25 and 26 April 1988. For information contact Professor H. P. C. Shetty, College of Fisheries, University of Agricultural Sciences, Mangalore 575 002, Karnataka, India.

## PROCEDURES FOR INTRODUCTION OF AQUATIC ORGANISMS INTO THE COLORADO RIVER BASIN

The Colorado River Wildlife Council is an enlightened group of representatives from seven state fish and wildlife agencies and eight federal agencies. On April 4, 1987, they adopted the following protocol for introductions. The first test of this procedure is the proposed introduction of rainbow smelt, discussed in the next sections of this newsletter.

Colorado River Wildlife Council Procedures for Introduction of Aquatic Organisms into the Colorado River Basin

Introduction proposals will be considered by the Council on a case-by-case basis. The applicant must adequately address the biological and socio-economic ramifications of the introduction in a written proposal to the Council. The proposal must include consideration of:

1. the need for the introduction
2. expected benefits
3. possible negative impacts
4. evaluation of potential displacement of indigenous species
5. evaluation of the ecology of the species
6. evaluation of disease potential
7. evaluation of potential for hybridization
8. post-introduction evaluation of status and impacts

Aquatic organisms prohibited for introduction into the Colorado River Basin include species which may:

1. cause or accelerate the decline in status of any indigenous species
2. jeopardize species esteemed for their sporting or aesthetic attributes
3. pose a threat to humans
4. cause habitat degradation



Written proposals shall be submitted to the Council Secretary 60 days prior to the convening of the Technical Committee in February. The Secretary will distribute the proposal to the appropriate committees or subcommittees for review prior to the annual Technical Committee meeting. A request for an exception to the time provision of this procedure, as provided by Council by-laws Article V., Paragraph F., may be made by anyone proposing an introduction.

## THE CASE FOR INTRODUCING RAINBOW SMELT INTO THE COLORADO RIVER

The following is the summary and conclusions section of the proposal for the introduction of Osmerus mordax into the Colorado by Wayne Gustaveson and Bruce Bonebrake of the Utah Division of Wildlife Resources. The authors also prepared a detailed "Assessment for the Need for Forage Enhancement for the Benefit of Lake Powell Game Fish." Both documents provide an excellent coverage of the relevant literature and are carefully reasoned.

Rainbow smelt have been demonstrated to be a valuable forage species in many deep cool water lakes. They tend to occupy pelagic and deep water zones and avoid epilimnetic waters during much of the year. Rainbow smelt in Quincy and Rampart Reservoirs meet many of the criteria for a desirable forage fish (Ney 1981). They are prolific, trophically efficient, vulnerable to predation, and appear to be harmless (Goettl 1983).

Lake Powell, with its absence of deepwater forage fish, seems to be an excellent choice for rainbow smelt introductions. The hypolimnetic waters of Lake Powell range from 7.0-12 C during the summer (Merritt 1976) and are well within the smelt's preferred temperature range. Rainbow smelt would provide a schooling forage fish that would occupy the same strata as walleye and striped bass during the entire year. Adult smelt would be thermally partitioned from shad and yoy gamefish in the stratified reservoir and offer little threat of direct competition for food or space.

Rainbow smelt have the potential to become established in Lake Powell despite the overabundance of predators that currently exist. They would provide forage for striped bass and walleye, and potentially allow shad to be utilized by littoral predators. Unlike most other candidate species, established, reproducing populations would be confined to the portion of the system upstream of Lake Havesu due to the smelt's coldwater temperature requirements. Smelt have proven to be beneficial in the Missouri River system without significant negative impacts (Schmulback et al. 1983, G. Marrone, So. Dakota Dept. of Game and Parks, personal communication, 1987). Further, Berard (North Dakota State Fish and Game Department, personal communications 1987) flatly states "the rainbow smelt is the salvation of the Missouri River system reservoirs." Smelt would seem to be a beneficial addition to the Colorado River system.

## A RESPONSE TO THE PROPOSAL TO INTRODUCE RAINBOW SMELT

J. A. St. Amant, chairman of the Colorado River Wildlife Council, asked your editor to respond to the proposal. What follows are my comments.

1. I doubt the introduction will solve the problem of declining (or cyclic) fisheries for predatory fish in Lake Powell or other similar reservoirs. As the assessment points out, fisheries managers have continually been surprised at how various species have adapted, or not adapted, to reservoir conditions. Predictions as to beneficial effects of introduction have rarely been fulfilled, usually because not enough is known about the system or the species being introduced. In fact, it is common for new introduced species to do more harm than good.

2. Reservoirs are inherently unstable systems that rarely have their waters managed with any thought for what is best for fish or fisheries. A new introduction is therefore unlikely to increase the stability of reservoir fish populations, the presumed goal of the smelt introduction. Part of the solution to the problem of reservoir fisheries is to do a better job of letting the public know that they simply cannot expect good fisheries every year in reservoirs as they are not natural systems. Fisheries managers need to stop taking the blame for problems created by water managers!

3. As the proposal states, movement of smelt from the reservoir is quite likely, but will be probably more extensive than indicated. Other smelt introductions have generally led to their spread in the region. For example, rainbow smelt are now found in the Mississippi River as far south as Kentucky (Burr and Mayden 1980). An example of rapid spread is the inland silverside, which was introduced into Clear Lake in northern California in 1967 and by 1981 was abundant in southern California reservoirs and all places in between. Also, the capacity of anglers, especially those with live wells in their boats, to move fish around has greatly increased in recent years; they have been spreading inland silversides, threadfin shad, and white bass all over California! Thus any evaluation of the potential effects of the smelt introduction should include evaluation of their effects on the fishes of other waters in the system as well, both upstream and downstream.

4. The brief evaluation of the potential effects on threatened and endangered species is inadequate (see #3) and contradictory. If smelt could serve as a "buffer" species to reduce predation on native fishes, they could also serve as a buffer species to keep the populations of predatory fishes high (which, of course, is the purpose of the introduction) and keep predation pressure high on the small populations of native fishes. I did not see any mention of the possible effects of the introductions through food chains, etc., on possible reintroductions of the T&E species into the reservoirs. The situation for the T&E species is so precarious in the river, it seems to me that if an introduction has even a remote chance of hurting them it should be prohibited.



5. I would question the statement that "smelt have proven to be beneficial in the Missouri River system without negative impacts," because I doubt there is enough information on the effects to really make a statement like that.

6. The proposal implies that studies are now under way on the limnology of the reservoir, but does not mention any results of them. It seems to me that this proposal is premature if the studies are not completed. Is it really known, for example, that there is adequate plankton in the deep waters to support smelt?

7. I was impressed by the rhetoric at the end of the assessment paper: "Failure comes only by giving up hope. We can succeed by making the right choice at the right time." I agree with it, of course, and can only respond with a quote from Aldo Leopold, "Exotic wildlife has served as a perfect alibi for postponing the practice of game management."

## NORTH AMERICAN CRAYFISH DISEASE CREATES PROBLEMS FOR EUROPEAN CRAYFISH

The following resolution, adopted at the 7th International Symposium of Astacology in Lausanne, Switzerland (August 5, 1987), is a good illustration of the results of unexpected side effects on an introduction, the introduction of a disease. It states:

> The astacologists of the International Association of Astacology meeting in the Seventh International Symposium in Lausanne, Switzerland, 3-5 August 1987, have noted:
>
> (1) the marketing of new living crayfish species from many different places; (2) the total absence of guarantees that such crayfish do not carry communicable parasites and diseases; (3) the appearance of epidemics in European crayfishes of aphanomycosis (the crayfish plague parasite), especially where it has not previously existed; (4) the accrued risks of transmission of parasites and diseases, especially aphanomycosis, from other crayfish populations to native crayfish; (5) the grave menace to native crayfish populations from introduction of undesirable exotic crayfish; and (6) the potential for exposing fish to diseases and parasites borne by crayfish.
>
> Therefore, in view of the need for conservation of indigenous species and populations, we recommend that governments find the means to stop the importation of living crayfish to their countries for any purpose (food, fish bait, pets, etc.), except for governmentally approved research, restockings, or introductions. Further, those governments should be responsible for assuring that such living crayfish are parasite- and disease-free. Finally, governments should encourage the restoration of native crayfish stocks wherever possible.

Editor's note: Aphanomycosis was introduced into Europe around 1860 with signal crayfish (*Pacifastacus leniusculus*) from the western USA. It spread rapidly, decimating the native *Astacus* species.

## PRELIMINARY RESULTS OF GRASS CARP STOCKING IN OKLAHOMA

The following abstract was stolen from the program of the joint meeting of the Oklahoma Chapters of AFS and The Wildlife Society, 20-21 August 1987. It is by Larry Cofer, Oklahoma Department of Wildlife Conservation.

> The Oklahoma Department of Wildlife Conservation has used grass carp to eliminate aquatic weeds in hatchery ponds, lakes to be fertilized, and to control weeds in lakes where the aquatics were too dense for successful angling and predator/prey interaction. Three ponds (2, 40, and 80 acres) and one lake (885 acres) stocked at 10 fish/acre in 1984 were completely cleared of vegetation by the next year. Some Ft. Sill ponds and several small lakes stocked at varying lesser densities of carp have shown partial or no noticeable results. Grass carp in growout and brooder hatchery ponds are beneficial, but they interfere with harvest in fry and fingerling ponds. Studies have shown that aquatic vegetation and/or the trophic status of lakes determine their ability to provide desirable bass populations. Therefore, if fishing is emphasized as a major lake use, grass carp stockings should not completely eliminate vegetation unless natural or artificial fertility will be adequate. Partial stockings over several years (and patience) are recommended over one major stocking, given the potential negative and long-term effects of grass carp. Lake drawdowns are recommended as alternative controls or supplements to weed control by grass carp. A pamphlet is needed to inform pond owners about stocking strategies and potential problems with grass carp.

## PRELIMINARY PROGRAM, SECTION SYMPOSIUM FOR NEXT AFS MEETING

Quantitative Effects of Introduced Fishes. Organized by James P. Clugston, USFWS, National Fisheries Research Center, and Paul L. Shafland, Florida Game and Fresh Water Fish Commission.

1. Clugston, J. P. (National Fisheries Research Center, Gainesville, FL). Introduction.

2. Nepszy, S. J. (Ontario Ministry of Natural Resources, Ontario) and K. M. Muth (U.S. Fish and Wildlife Service, Sandusky, OH). Biological and socio-economic impacts of rainbow smelt, Osmerus mordax, on the fisheries of Lake Erie.

3. Unkenholz, D. (South Dakota Department of Game, Fish, and Parks, Pierre, SD). Chinook Salmon, Oncorhynchus tshawytscha, Introductions in a South Dakota Missouri River reservoir.

4. Lee, D. P. (California Department of Fish and Game, Rancho Cordova, CA). Contribution of introduced fishes to California's inland sport fish catch and effort.

5. Moore, S. E. and G. L. Larson (National Park Service, Gatlinburg, TN). Impacts of introduced rainbow trout on native brook char populations in Great Smoky Mountains National Park.



6. Matthews, W. J., F. P. Gelwick, and L. G. Hill (University of Oklahoma Biological Station, Kingston, OK). Habitat and food overlaps between native largemouth bass and introduced striped bass in Lake Texoma (Oklahoma-Texas).

7. Morizot, D. C. (University of Texas System Cancer Center, Smithville, TX), J. H. Williamson (U.S. Fish and Wildlife Service, San Marcos, TX), and G. J. Carmichael (U.S. Fish and Wildlife Service, Pinetop, AZ). Hybridization among native and introduced Micropterus spp. in central Texas.

8. Forshage, A. (Texas Parks and Wildlife Department, Tyler, TX). Evaluation of the Florida largemouth bass in Texas, 1971-1987.

9. D. P. Philipp and J. E. Claussen (Illinois Natural History Survey, Champaign, IL). Mismanagement through Stock Transfer: Differential performance characteristics of largemouth bass stocks.

10. Bettoli, P. W. (Tennessee Tech. University, Cookeville, TN), R. L. Noble (North Carolina State University, Raleigh, NC), and W. J. Clark (Texas A&M University, College Station, TX). Limnological and planktivorous fish responses to vegetation control by grass carp in Lake Conroe, Texas.

11. Ragan, J. E. (North Dakota Game and Fish Department, Bismarck, ND). A discussion of the merits of introducing zander, Stizostedion lucioperca, into North Dakota waters.

12. Shafland, P. L. (Florida Game and Fresh Water Fish Commission, Boca Raton, FL). Wrap-up.

## SMALLMOUTH BASS SYMPOSIUM PLANNED

Donald R. Jackson is interested in organizing a symposium on smallmouth bass for an upcoming AFS meeting. Because they are a widely introduced species, contributions from this section would be appropriate. If interested, contact Dr. Jackson at Department of Wildlife and Fisheries, Mississippi State University, P.O. Drawer LW, Mississippi State, MS 39762.

## ECOLOGICAL IMPERIALISM: A BOOK REVIEW

Ecological Imperialism: The biological expansion of Europe, 900-1900. Alfred W. Crosby. Cambridge University Press. 368 pp. $22.95, 1986.

The greatest danger for this book is that it might be dismissed because "imperialism" is a term we usually only hear when it is used by the Soviets to describe all actions of western civilization. The fear that this book might be a similar diatribe would be reinforced when a potential reader sees that one of the introductory quotes is from the Manifesto of the Communist Party. However, if the potential reader notes that the other introductory quotes are from Charles Darwin, Adam Smith, and Charles Lyell, then the actual broad-ranging-but-firmly-based scope of this book might be suspected.

The book examines the geological, climatological, sociological, and economic features of Europe that facilitated the exportation of its biota to much of the rest of the world. Generalizations about which ecological features are important are estimated by comparing the successful conversion into "little Europes" of Australia, New Zealand, and most of North America, with the failures to do so in the Middle East, Africa, and Central and South America. Many of the stories of invasion will be familiar to biologists, but in almost all cases new angles and documentation are brought out. Sadly, fish are not mentioned.

The dominant theme of the book is that it is not a series of invasions by separate species that has accompanied the spread of western Europeans into new lands; rather a whole community has been transplanted. The introduction of diseases frequently contributed to the spread of European people and their symbionts. New methods of agriculture and newly introduced species of herbivores made possible the rapid domination of landscapes by European plants. This view of ecology of invading communities helps bring all the separate parts of the book into clear focus.

This book is strongly recommended for members of this section as it provides a global and historical perspective on the problems of introduced species.

--B. Herbold

## WALLEYE IN THE LOWER COLUMBIA RIVER

Walleye (Stizostedion vitreum vitreum) have become established throughout the Columbia River downstream of, and including, Lake Roosevelt behind Grand Coulee Dam in Washington. It is believed that the populations in the lower Columbia resulted from initial introduction in northeastern Washington. The expansion of walleye in the system has been viewed variously as the basis of a tremendous new fishery by biologists and sportsmen interested in resident fishes, and as an unmitigated disaster by those concerned with predation on migrating salmon and steelhead smolts. Current research on salmonid predators in a single Columbia River reservoir conducted by the Oregon Department of Fish and Wildlife and the U.S. Fish and Wildlife Service, suggests that neither view may be correct. Habitat appears to be suitable for walleye and growth of individuals is very good, but the size of the population has been limited by highly variable reproductive success. Good fishing has occurred, but it is tied totally to the presence of strong year classes and has been short-lived. The boom and bust nature of the fishery obviously limits its value. Walleye do act as predators in the system and over a period of 5 years were responsible for a loss of about 2% of all juvenile salmon and steelhead migrating through a single reservoir. Given the observed variation in reproductive success, predation could vary two to threefold, and obviously could be more important following years of strong recruitment. The contribution to total predation is, and is expected to be, relatively minor, however. Total losses in the system were dominated by predation from northern squawfish (Ptychocheilus oregonensis), a native cyprinid, which consumed roughly six times the number of salmonids as walleye.



The role of walleye in the community has not been studied. A negative correlation between year class strength of walleye and concurrent year class strength of squawfish was found, however, and could suggest some interaction. Others have suggested that walleye are capable of limiting year class size in cyprinids and other small littoral zone fishes.

--Kevin Hopkins

--Information provided by Bruce Rieman and Ray Beamesderfer, Oregon Department of Fish and Wildlife, Research and Development Section, Dam & Hydro Studies Program, 17330 S.E. Evelyn Street, Clackamas, Oregon 97015.

## AUSTRALIA BANS NILE PERCH: AN ABSTRACT

Biology of the Nile Perch Lates niloticus (Pisces: Centropomidae) with Reference to its Proposed Role as a Sport Fish in Australia. C. G. Barlow and A. Lisle. Biological Conservation 39(1987) 269-289.

The Nile perch Lates niloticus has been proposed for introduction to Australia to establish sport fisheries in tropical impoundments. Three lines of evidence suggest that the introduction would be potentially disastrous for Australian aquatic fauna. The lower temperature tolerance of the species and analysis of water temperatures in rivers of eastern Australia indicate that its range would extend to temperate regions in the country, thus endangering established fisheries for native species. The introduction of the Nile perch, an opportunistic predator, to Lake Victoria and Lake Kyoga in eastern Africa has caused a drastic decrease in species diversity and fish biomass. L. niloticus is not restricted to lacustrine habitats, and its biology indicates that it could colonise and adversely affect the fauna in a broad range of freshwater habitats in Australia. The risks associated with the proposed introduction are considered to outweigh the potential benefits. Consequently, the agency responsible for the evaluation programme has abandoned the concept of introducing the Nile perch to Australia.

## IS BIGGER PRINT NEEDED FOR NEWSLETTER??

The present format of the newsletter exists because it is a cheap way to send out a lot of information. But if the newsletter goes unread because the potential readers fear going blind, then it is a poor way to save money. Let me, Nick, or any other officer or representative know if you think we need to go to a larger format. Ask your colleagues as well, especially potential members.

## NILE PERCH VERSUS LAKE VICTORIA CICHLIDS

At the fifth Congress of European Ichthyologists held at Stockholm, 12-16 August 1985, the following resolution was passed:

Resolution

Recognising that never before, man in a single ill advised step placed so many vertebrate species simultaneously at serious risk of extinction and also, in so doing, threatened a food resource and traditional way of life of riparian dwellers, we, of the Cichlid Workshop, resolve to engender support through the Secretary to the Union of European Ichthyologists and by individual endeavour to conserve the fishes of Lake Victoria.

Sub-resolutions

The Cichlid Workshop recommended further that:

(1) To win time for those species which are at present facing extinction, as many species as possible should be placed in gene banks (using cryopreservation techniques and holding these species in aquaria).

(2) To reduce drastically the populations of the introduced Nile perch, intensive selective fishing should be carried out and, simultaneously through research a practical biological control method for the Nile perch should be sought.

(3) The species held in gene banks should be reintroduced in the Lake when the Nile perch stock has been reduced to levels at which native populations may be maintained substantially.

(4) Recognising that the goal achievement outlined above is dependent on an ability to identify exactly the species which are currently threatened. Therefore it is clear that a greatly increased research effort is essential. The meeting resolved to recommend that funding and personnel for such research should be found as soon as possible.

(5) Recognising the extreme vulnerability of species within the Lake and realizing that gene banks are not entirely safe refuges for species, the meeting recommended that comprehensive museum collections should be made as soon as possible to form permanent records of the existing diversity in Lake Victoria.

Editor's note: The recommendations of the resolution are desperation measures. The destruction of Lake Victoria's cichlids is probably the biggest disaster ever perpetrated by an introduced fish. We need to work to avoid repetitions of this tragedy.



## NEWSLETTER REPRESENTATIVES

NORTHEAST
Scott Fahle
6 Walden Place
Dennis, MA 02638
(617) 775-8883 work
338-2020 home

SOUTHEAST
Dr. Rich Noble
Zoology, NCSU
Campus Box 7617
Raleigh, NC 27695
(916) 737-2741

GREAT LAKES
Dr. William Le Grande
Department of Biology
University of Wisconsin
Stevens Point, WI 54481
(715) 346-4254

SOUTHWEST
open, volunteer needed

NORTHWEST
Dr. Kevin Hopkins
Department of Fisheries
and Wildlife
Corvallis, OR 97331
(503) 754-2228

NORTHCENTRAL
Dr. John Peterka
Department of Zoology
North Dakota State
University
Fargo, ND 58105

WEST COAST
John Dentler
National Marine Fisheries Service
Southwest Region
300 South Ferry Street, Room 2016
Terminal Island, CA 90731
(213) 514-6686

## FEARLESS LEADERS IN 1988

President: Nick C. Parker, U.S. Fish and Wildlife Service, 503 Bibb St., Marion, AL 36756 (205-683-6175)

President-elect: Peter B. Moyle, Department of Wildlife and Fisheries Biology, University of California, Davis, CA 95616

Past-president: Jim Clugston, USFWS, 7920 NW 71st St., Gainesville, FL 32606 (904-378-8181)

Secretary-treasurer: Paul Shafland, Florida Game and Fresh Water Fish Commission, 801 NW 40th St., Boca Raton, FL 33431 (305-391-6409)