



NEWSLETTER

of the Introduced Fish Section
American Fisheries Society

December 1994

Don Baltz, Editor

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NEWSLETTER CONTENTS

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PRESIDENT'S CORNER

MEA CULPA, MEA CULPA, MEA MAXIMA CULPA!!! Though you the membership of the Introduced Fish Section have been very active (per the content of this newsletter), I have not kept up with my duties as President of the Section. Since the last newsletter I have gotten married, become a daddy, and survived a Congress (though many others did not). There are, however, no adequate excuses and I offer my sincere apology to all Section members for my negligence. Let's get on with the business of the Section!

So, let me share some information and mention some issues we need to move on:

SECTION ELECTIONS -- First, and long overdue, we need to elect (find volunteers for?) a full suite of officers - President, President-elect, Secretary/Treasurer, and Newsletter Editor. Larry Zuckerman and Don Baltz have graciously indicated their willingness to continue serving the Section as Secretary/Treasurer and Newsletter Editor, respectively. [However, DB would not mind coming in second in an election---Ed.] I know there are others in the Section who are interested in serving as Section officers, so let's first "open the floor" to nominations so that all have a crack at it. Please notify any of the Section officers (phone #s & addresses at end of Newsletter) before January 31, 1995 and we will put together a ballot for mailing to the full membership soon after. The elected President will have the opportunity to serve out the remainder of the 1994-95 term (until the Society meetings in Tampa) or to take over the reigns in Tampa. The President-elect "apprentices" for a year (or partial year) and serves as President the following year. Let's hear from you!

AQUARIUM FISH IN TAMPA? -- Our section, with the help of local members in Florida, is looking into the possibility of sponsoring (or cosponsoring with the Fish Culture Section) a symposium and/or field trip focusing on the aquarium fish industry. The Tampa area is an important hub for growers and importers of tropical aquarium fishes. The meeting site provides AFS an extraordinary opportunity to learn about the industry and how it works -- e.g., how integral non-native species are to its product lines; how they are managed; how quickly decisions must be made, etc. Tropical fish farmers are understandably hesitant to step into the AFS lair, but we are working to overcome the hesitance and provide a forum to enlighten AFS membership on the value and functioning of their industry. Who among us has not owned an aquarium or enjoyed the educational experience of visiting public aquariums?

BOON, BANE, OR BOTH? -- The "Report to Congress on the Findings, Conclusions, and Recommendations of the Intentional Introductions Policy Review" prepared by a Federal interagency task force was recently completed. The report found that whether introduced for sport, aquaculture, or aquarium use, the effects of such introductions run the gamut from beneficial to detrimental and sometimes both. The report also found and stated clearly that "simply being nonindigenous does not constitute sufficient reason to confer nuisance status" (under the Nonindigenous Aquatic Nuisance Species Prevention and Control Act -- see next entry) and specifically rejected options that could have provided greater Federal control over State management decisions. Instead, measures to improve education, cooperation, and accountability are emphasized. Recommendations include greater research and extension, improved implementation of existing law, federal review of importations of species from outside the U.S., and cooperative decision making. Copies of the report are available from the ANS Task Force Coordinator, U.S. Fish and Wildlife Service, 1849 C Street, NW. (820 ARLSO), Washington, DC 20240, or phone 703-358-1718.

NONINDIGENOUS ACT -- The Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 is due for reauthorization in 1995. AFS executive leadership and the Legislative Committee have expressed an interest in having the Introduced Fish Section put together an AFS position statement on reauthorization. If you are interested in working on this task, please contact me (address, phone, FAX number, and e-mail at end of Newsletter) or Don Horak (745 Summit View Drive, Fort Collins, CO, 80524). We will be working together, and likely with members of the Fisheries Administrators Section, to draft a position paper. Copies of the Act are available from the same address as the Intentional Introductions report (above).

USES OF CULTURED FISHES -- This past spring, several Introduced Fish Section members participated in the AFS Symposium on "Uses & Effects of Cultured Fishes in Aquatic Ecosystems." Past-President Mark Konikoff was instrumental in facilitating a session on "Exotic Fishes." As Section President, I made one of the session presentations and coordinated the on-site development of a Section "position" on the use of cultured fishes. In a rather remarkable coffee table meeting, Section members present at the symposium (including Don Horak, Frank Pfeiffer, Bruce Schmidt, Walter Courtenay, Paul Shafland, myself and others) all actually AGREED on a position that simply states, with two caveats, that when cultured fishes are introduced beyond their natural range, the existing AFS protocol should be followed in its entirety. The caveats were: 1) a recognition that "what's here is here" (i.e., prevention is key, and we should concentrate on application of the protocol to any further range expansions since it is both biologically and socially difficult to remove introduced species from ecosystems they already inhabit), and 2) other valid protocols exist that may be followed so long as they fully encompass the policy and decision-making approach of the existing AFS protocol. If you flinched at the position, don't worry too much, "positions" drafted at the symposium were NOT official Section positions and were provided to the EXCOM only as guidance for subsequent deliberations. I can provide copies of the full position statement to anyone interested.

Change - you say you want change? On the morning of November 9th, I threw out my old rolodex and started all over again. Who knows what ideas float to the surface in a stew whose main ingredient is "Ire of Newt?" One sure bet is that a number of the "floaters" will be nonindigenous to Capitol Hill's business as usual. Will they be boon or bane - who knows? One thing that I can assure will change in DC is that your President will better serve his Section!

FROM THE EDITOR

Thanks to those of you who have sent in materials for the Newsletter. I am always looking for contributions, so keep the Newsletter in mind when you see an item that might be of interest to IFS. You can submit items by FAX, e-mail, or snail-mail. See addresses at end of newsletter.

Correspondence

YELLOWSTONE DISASTER?/\$10K REWARD Correspondent: Dennis Lassuy

A news release from the National Park Service reports that "Lake trout (*Salvelinus namaycush*) have been discovered in Yellowstone Lake, where they pose a grave threat to the future of the lake's native Yellowstone cutthroat trout (*Oncorhynchus clarki bouvieri*) and to many other animals." Park Superintendent Robert Barbee described the apparent illegal stocking "an appalling act of environmental vandalism." A \$10,000 reward is offered for information leading to the arrest and conviction of those responsible for introducing lake trout into Yellowstone Lake. Barbee noted that though the introduction may seem minor to some, he felt the introduction could result in "an ecological disaster" with severe impacts on other species dependent upon the cutthroat as a food source. He also noted that "some thoughtless individual has jeopardized a sport-fishing resource" that is the basis for a multi-million dollar sport fishery with anglers coming from all over the world to fish for these wild native fish. For further information, or to report any information pertinent to the case, contact either the Chief Ranger, P. O. Box 168, Yellowstone National Park, WY 82190 or by phone at 307-244-2101, or call the Fish and Wildlife Service Yellowstone Fishery Assistance Office at 307-344-2281. Donations to support management and research actions to protect Yellowstone's native trout may also be sent to the Yellowstone Fishery Fund at the Chief Ranger's address.

Chesapeake Bay
Correspondent: Dennis Lassuy

The Chesapeake Bay Commission, a tri-state legislative commission serving the General Assemblies of Virginia, Maryland, and Pennsylvania, recently held a two-day roundtable discussion concerning ballast water management practices for the bay. For further information, contact Ann Pesiri Swanson, Executive Director, 60 West Street, Suite 200, Annapolis, MD, 21401.

Grass carp certification
Correspondent: Dennis Lassuy

A recent letter from the U.S. Fish and Wildlife Service's Region 4 (Southeast) to U.S. Senator Dale Bumpers, indicated that the Region will no longer be able to afford to provide certification services (certifying triploidy in grass carp) to private fish farmers free of charge. Fee for services options are being looked into.

Great Lakes ANS Update
Correspondent: Dennis Lassuy

The first and second editions of the "ANS Update" have been published by the Great Lakes Panel on Aquatic Nuisance Species. It is scheduled to be released quarterly. For information on the Update, contact Lori Reynolds at the Great Lakes Commission, The Argus II Bldg., 400 Fourth Street, Ann Arbor, MI 48103-4816, or by phone (313-665-9135) or e-mail (lreynolds@glc.org).

Ballast Water Management Act
Correspondent: Dennis Lassuy

A "Ballast Water Management Act" was passed in the House, but failed to receive Senate attention prior to adjournment. The Act called for funding of a study of ballast water management techniques and, based on that study, a program to demonstrate technologies and practices to prevent aquatic nonindigenous species from being introduced and spread through ballast water in the Great Lakes and other United States waters. It is likely that this, or a similar bill, will be reintroduced when the 104th Congress convenes in January.

20,000 Leagues of Papers
Correspondent: Dennis Lassuy

The proceedings of the NEMO conference are now available. It's not a workshop on wrestling giant eight-armed nonindigenous species, but a compilation of papers presented at an April 1993 conference on Nonindigenous Estuarine and Marine Organisms. It is available from Herb Kirch, National Oceanic and Atmospheric Administration, Herbert C. Hoover Building, 14th and C Streets NW, Rm. 6117, Washington, DC 20230 or by phone at 202-482-5181.

Tomé Nears Readiness
Correspondent: Dennis Lassuy

A draft of the "Preliminary Report on Nonindigenous Fishes in Inland Waters of the United States" contains a wealth of information on over 400 species imported to or transplanted within the U.S. beyond their natural range. Information includes species narratives, distributional information, and the likely mechanism(s) of introduction. The document is currently under review. However, even as information in the draft is being updated, some of its data are available now through internet (<http://www.nfrcg.gov>). For further information contact either Pam Fuller or Charles Boydston at the Southeastern Biological Science Center, 7920 NW 71st Street, Gainesville, FL 32653 or by phone at 904-378-8181.

Another exotic goby in San Francisco Bay
Correspondent: Peter B. Moyle

Scott Matern at UC Davis discovered that the "chameleon" goby that has exploded in the S.F. Delta is not *Tridentiger trigonocephalus* but *T. bifasciatus*, a previously unreported species, also from Japan. He has given it the name shimofuri goby, after the Japanese name for it. Actually, both species are present, but the chameleon goby is primarily in the S.F. Bay. The shimofuri goby is in the Delta (and Suisun Marsh), and has spread to reservoirs in southern California via the aqueduct. Matern is submitting a paper to Transactions on the invasion soon. The shimofuri is now one of the most abundant fishes around, increasing while everything else declines. See the latest paper in TAFS (1994) by Meng, Moyle & Herbold (where the shimofuri goby is incorrectly identified).

A LITTLE KNOWLEDGE?
Correspondent: Dennis Lassuy

A recent publication of interest: Miller, M. and G. Aplet. 1994. Biological control: a little knowledge is a dangerous thing. Rutgers Law Review 45(2):285-334. In the paper, the authors note that biocontrols are "powerful tools" with both benefits and risks "that should not be overlooked" and conclude that biocontrol is an area of environmental manipulation that is inadequately addressed in law

Grass carp risk too high in Oregon
Correspondent: Hiram W. Li

The Oregon Fish and Wildlife Commission decided that the "experiment" to use grass carp to control aquatic weeds revealed the potential for unwanted side effects. The risks were too high.

Snake River Fall Chinook Recovery
Plan.....Correspondent: Hiram W. Li

The recovery plan identifies introduced game fishes as part of the problem. No size, season, or bag limits. The idea is not to overfish these predators, if possible.

Biotic resistance & Atlantic salmon
.....Correspondent: Edward Black

An interesting topic with some immediate applicability in the real world.

My own interest is the apparent inability of Atlantic salmon (*Salmon salar*) to be transplanted (introduced) outside of its natural range (I am told in rare instances totally land-locked populations have taken hold in Chile or Argentina).

This species is a much loved sport fish and as is the way with humans we tend to take our loved ones with us when we can.

Speaking of my own home territory prior to 1980 there were at least 94 separate introductions of Atlantic salmon into 54 different water bodies on the West coast of Canada. This includes all life stages (eggs, alvin, fry, and adult). Many of these introductions involve too few individuals to expect success. However, a number of very serious attempts were made to introduce this species to this coast including one that spanned 7 years with an average introduction of 3/4 million eggs or fry annually. None of these had any success.

Since the late 70's, farming of Atlantic salmon has become popular on this coast. Farming Atlantic salmon on the West coast originally started in Washington State. Now it is widely practiced on both sides of the border. As our experience with salmon farming improves, the proportion of losses decreases. However, each year, tens if not hundreds of thousands of Atlantic salmon escape into the ocean. [Editor's Note: Apparently the salmon ranchers cannot account for about 20% of their stock.]

Relatively few of these make it back to freshwater. The highest count being 24 in the Fraser River system (the nearest Atlantic Salmon farms are in Puget Sound, Washington) with most reports being one or two fish (Burt, D.W., et al. 1993. Presence of cultured Atlantic salmon in British Columbia rivers in 1990 and 1991. Unpub. Rpt. B.C. Ministry of Agriculture Fisheries and Food, 40 pages; Thompson, A.J. & S. McKinnell 1993. Summary of reported Atlantic salmon (*Salmon salar*) catches and sightings in British Columbia in 1993. Canadian Manuscript Report of Fisheries and Aquatic Sciences No 2246, 35 pages; Thompson, A.J. & S. McKinnell 1994. Summary of reported Atlantic salmon (*Salmon salar*) catches and sightings in British Columbia and adjacent waters in 1993. Canadian Manuscript Report of Fisheries and Aquatic Sciences No 2246, 35 pages.)

If ever there was a case of biotic resistance, this would appear to be one. One might argue that it is a case of biotic incompetence on the part of Atlantic salmon. However, the successful introduced land-locked populations suggest that in certain, very special cases, this species can succeed outside its home range. Ergo, there is more than just the competence of the introduced species involved.

This becomes even more interesting when you consider that on this coast the fish populations one might suppose to be the likely competitors (Pacific salmon, trout) have population sizes that are much reduced from historical levels. Some of this reduction is unquestionably due to habitat deterioration. However, with our extremely efficient sport and commercial fishing fleets I find it untenable to suggest that streams are producing at maximum capacity. This suggests that there should be a "niche" available for the successful introduction of Atlantic salmon.

This experience has lead me to question the dogma that with enough attempts you can introduce any species especially where the environment is compatible and natural competitors have reduced population sizes.

This in no way suggests I am in favor of the introduction of viable populations of alien species. What interests me is the fact that there is some resistance to the introduction of non-native species. Can we predict or start to develop our understanding of how strong that resistance will be for other species?

Fundamentally, I'm pessimistic about our ability to control introductions. We can, more or less, control intentional introductions but I suspect that these are a minor portion of all introductions. The aquaria trade and modern vehicular travel make a myriad of accidental introductions inevitable. I wonder if we would be more capable of managing the effects of

introductions if we could predict what are the species that are likely to succeed as invading species.

Comments? [Edward Black, Aquaculture and Commercial Fisheries Branch, B.C. Ministry of Aquaculture, Fisheries, and Food, 808 Douglas St., Victoria, BC V8W 2Z7 or Internet: eblack@galaxy.gov.bc.ca]

Biotic Resistance

.....Correspondent: Hiram W. Li

The idea concerning biotic resistance was expressed in terms of island biogeography by Barbour and Brown (1974 Amer. Nat. 108:473-489) and further refined in terms of exotic species by John Magnuson (1976 Trans. Amer. Fish. Soc. 105:1-9).

Island biogeography doesn't explain everything; witness the introduction of Nile perch to Lakes Albert and Victoria. I also tried to examine factors of productivity, age, latitude, and lake dimensions to explain patterns of successful invasions and found no consistent patterns.

The key may be in the differences in evolutionary histories of the organisms in question. I think that evolutionary mismatches that circumvent or change patterns of negative feedback in communities is more important. Why is it that *Petromyzon marinus* is not a big problem in the finger lakes of New York but a major problem in the upper Great Lakes? I suspect that the species inhabiting both lake systems that are nominally the same, are critically different because one "race" evolved with predation and co-adaptation of predator and prey took place. The fishes in Lake Victoria were never exposed to predators like the Nile perch in their evolutionary history. It is also interesting that many drastic changes in the fish assemblage occur when invading predators become established in a new environment.

The reason that invaders can gain footholds in perturbed habitat is that the native species don't do well when the environmental constraints shift away from the conditions under which they evolved; whereas, the invaders may be preadapted for those conditions.

We also neglect the influence of disease in invasion success or failure. John Holmes and Peter Price consider this as being of critical importance. Think about how populations Polynesians and American Indians were devastated by small pox (see papers by Jared Diamond) or the introduction of avian malaria to the Hawaiian Islands. The relative resistance by native and exotic species to various diseases may be like the practice of germ warfare.

Have you seen...?

Miller, M. and G. Aplet. 1994. Biological control: a little knowledge is a dangerous thing. Rutgers Law Review 45(2):285-334.

Abstract: In the paper, the authors note that biocontrols are "powerful tools" with both benefits and risks "that should not be overlooked" and conclude that biocontrol is an area of environmental manipulation inadequately addressed in law.

Busiahn, T.R. 1993. Can the ruffe be contained before it becomes your problem?. Fisheries 18: 22-23.

Abstract: The ruffe (*Gymnocephalus cernuus*) is an exotic nuisance fish capable of explosive population growth. The Eurasian percid became abundant within a decade of introduction into habitats in Scotland (Loch Lomond) and North America (western Lake Superior), while populations of endemic species declined sharply. Native to lakes and rivers throughout a broad swath of Eurasia, ruffe were introduced to Duluth Harbor on Lake Superior via ballast water of an ocean-going freighter and were first collected in fish surveys in 1986. Its potential range extends from the Great Plains to the eastern seaboard and north into Canada. Prime areas for colonization in the Great Lakes include Lake Erie, Lake St. Clair, Saginaw Bay, and Green Bay. If the ruffe colonizes southern Lake Michigan, it has access to the Mississippi River. Fisheries management opinions about how and whether to control ruffe differ. Some believe that managers should deploy physical, chemical, and biological methods to contain ruffe and to reduce existing populations. Others maintain that ruffe are established in North America and will spread regardless of control efforts. The argument is exacerbated by a lack of control technology.

Demarais, B.D., Dowling, T.E., & Minckley, W.L. 1993. Post-perturbation genetic changes in populations of endangered Virgin River chubs. *Conservation Biology* 7: 334-341

Abstract: A 34-kilometer reach of the Virgin River, Utah-Arizona-Nevada, was poisoned with rotenone in an attempt to eradicate non-native red shiners (*Cyprinella lutrensis*), a species implicated in the decline of native fish populations in the American West. An error in detoxification resulted in lethal concentrations of piscicide passing through an additional 50 kilometers of stream. We used allozyme electrophoresis to analyze genetic variation among pre- and post-poison samples of endangered Virgin River chubs (*Gila seminuda*). Pre-poison samples indicated a single panmictic population in the river. In contrast, fish subsequently produced through natural recruitment in poisoned reaches exhibited deviations from the original pattern of genetic variation. A genetic bottleneck caused by severe reduction in the number of spawning adults was indicated.

DiDonato, G.T. & Lodge, D.M. 1993. Species replacements among *Orconectes* crayfishes in Wisconsin lakes: The role of predation by fish. *Can. J. Fish. Aquat. Sci.* 50: 1484-1488

Abstract: To test the role of size- and species-selective predation by fishes in species replacements among congeneric crayfishes in northern Wisconsin lakes, we tethered the same three sizes of each of three species of *Orconectes* at six sites in the littoral zone of Trout Lake, Vilas County, Wisc. Small crayfish (15-18 mm carapace length) were removed by fish at significantly higher rates than medium (23-25 mm) and large (33-35 mm) crayfish. *Orconectes virilis* was removed at significantly higher rates than *O. propinquus* and *O. rusticus*. These species-selection results suggest that predation by native fishes contributes to the previously documented replacement of the native crayfish *O. virilis* by the exotic crayfishes *O. propinquus* and *O. rusticus*. Fish predation is probably an important mechanism driving the replacement of *O. virilis* by *O. propinquus*.

Jones, M.L., & Stanfield, L.W. 1993. Effects of exotic juvenile salmonines on growth and survival of juvenile Atlantic salmon (*Salmo salar*) in a Lake Ontario tributary. Production of Juvenile Atlantic Salmon, *Salmo salar*, in Natural Waters. Gibson, R.J.;Cutting, R.E. (eds.). National Research Council of Canada, Ottawa, Ontario, Canada. 118 : 71-79.

Abstract: Restoration of self-sustaining populations of Atlantic salmon (*Salmo salar*) into Lake Ontario may be constrained by biotic interactions between this species and exotic salmonines that have established naturalized populations in streams that historically only supported Atlantic salmon. Wilmot Creek, one of two Ontario streams presently being stocked with juvenile Atlantic salmon, has excellent habitat quality but abundant populations of rainbow trout, coho salmon, and brown trout. To investigate the impact of biological interactions among these species on production of Atlantic salmon smolts, we isolated a series of eight natural side channels to Wilmot Creek for the purposes of manipulating competitor (and predator) abundances. The results suggest that biological interactions may limit rearing success of Atlantic salmon, at least for hatchery produced juveniles.

Lowe-McConnell, R.H. 1993. Fish faunas of the African Great Lakes: Origins, diversity, and vulnerability. *Conservation Biology* 7: 634-643.

Abstract: The largest African Great Lakes, Tanganyika, Malawi, and Victoria, which have the richest lacustrine fish faunas of any of the world's lakes, provide a unique comparative series for studies of evolutionary mechanisms, community ecology, and fish behavior. Their colorful littoral fishes are also known to aquarists worldwide. This paper examines the origins of their fish diversity, looking at the history of the lakes, colonization from river systems, and evolution of endemic faunas within each lake. All three lakes support fisheries of great socioeconomic importance for the rapidly rising human populations. The paper also examines the vulnerability of the faunas to fishing pressures and introductions of exotic species. In Malawi and Victoria, bottom-trawling has altered the cichlid species composition. The loss of an estimated 200 taxa of endemic cichlid species from Lake Victoria's fauna, following introductions of exotic fishes (tilapias and predatory centropomid Lates) 40 years ago, stresses the need to protect the unique fish faunas in Lakes Tanganyika and Malawi.

Mills, E.L., Leach, J.H., Secor, C.L., & Carlton, J.T. 1993. What's next? The prediction and management of exotic species in the Great Lakes (report of the 1991 workshop). Ann Arbor, MI, USA, Great Lakes Fishery Commission. 1993. 21 pp

Abstract: A workshop entitled "What Next?" The Prediction and Management of Exotic Species in the Great Lakes" was held in October 1991 to examine issues pertaining to exotic species and to recommend prevention and control strategies for future unplanned introductions into the Great Lakes. As long as the Great Lakes are inoculated with exotic species, new species will become established regardless of the state or condition of the ecosystem. Legislative and regulatory policies designed to prevent new unplanned introductions must consider management of entry vectors and be broad enough geographically to include the entire North American continent. Recommendations of the workshop are included.

Mussel-Watch

Zebra Mussel Teleconference: On December 20th there will be a satellite teleconference to introduce wide audiences to zebra mussel issues. This is the first of a planned series of teleconferences on the subject of zebra mussels. For information on this and future teleconferences, contact Charles O'Neill with the New York Sea Grant Extension Program, 248 Hartwell Hall, SUNY College, Brockport, NY 14420, or by phone (716-395-2638), FAX (716-395-2466), or e-mail (coneill@cce.cornell.edu).

Zebra Mussel Transport on Wetsuits:

A Note from the Long Term Resource Monitoring Program Illinois River Field Station (Contact: Doug Blodgett, 309-543-6000)

Preliminary results -- 24 October 1994 revision [extracted by Editor].

In North America, adult zebra mussels (*Dreissena polymorpha*) have been observed in 18 inland bodies of water that required overland transport for colonization to take place. Three of these are quarries frequented by SCUBA divers but offering limited opportunities for angling, boating, or other recreational activities. The discovery of zebra mussels in these quarries lead us to investigate the potential for passive transport of zebra mussels, especially larval veligers, on wetsuits.

[Material omitted here--Ed]

On 18 October, we conducted another test in Bath Chute, a side channel of the Illinois. A single wetsuit was exposed for 1 hr in water containing approximately 19 veligers/liter. We washed the suit in well water about 2.5 hr after the diver surfaced. Sampling indicated we had collected only 38 veligers from that suit, but 33% of those we found were obviously alive.

Finally, two suits were exposed to 39 veligers/liter for 1 hr at Havana on 20 October. Suits were washed in well water within 3 hr after divers surfaced, and we found no veligers in our samples.

The number of veligers needed to establish reproducing population of zebra mussels is unknown but results of this work indicate divers are a potential dispersal mechanism. While zebra mussels may increase water transparency and visibility, their potential negative impacts should prompt precautions to reduce the establishment (intentional or accidental) of new populations, especially in areas frequented by divers which could serve as seed populations for dispersal to other waters via wetsuit transport. Therefore divers and other wetsuit users, such as jet-ski riders, need to be educated to reduce the potential for contributing to the spread.

Still Looking [Contact: Larry Zuckerman]: In Kansas, Highland High School biology teacher Gary Keehn and his Stream Team volunteers monitor the Missouri River near the NE-KS border using artificial substrates. They have not found any yet. This stream team is part of the Kansas Wildlife Federation's Pure Water For Kansas Program and appears to be the only efforts in the state looking for this elusive exotic. Another team will start monitoring the Arkansas River near the OK-KS border.

1993-1994 IFS Officers

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Past President: Mark Konikoff, Department of Biology, University of Southwestern Louisiana, P.O. Box 42451, Lafayette, LA 70504 [(318) 231-6754; FAX: 231-6754]

Treasurer's Report (as of December 31, 1994): Correspondent: Larry Zuckerman

CREDITS:

Beginning Balance	22 DEC 93	\$2171.47
Section Dues	17 MAR 94	636.00
Section Dues	24 MAY 94	252.00
Section Dues	19 AUG 94	85.00
Section Dues	22 NOV 94	141.00
Sub-Total		\$3285.47

DEBITS:

Printing (Newsletter)	28 FEB 94	\$ 115.63
Postage (Newsletter)	1 MAR 94	42.64
Postage (Newsletter)	4 MAR 94	87.36
Bank Charges	DEC 93- DEC 94	8.00
Printing (Newsletter)	24 DEC 94	110.74
Postage (Newsletter)	24 DEC 94	140.00
Sub-Total		\$ 504.37

Mailing List Updates: Larry Zuckerman

Apparently, many of you did not get the last newsletter because of mistakes in your mailing label or it has not been updated in the Bethesda office in recent times. In any case, please mail, fax, or e-mail any corrections to your mailing label to the Secretary-Treasurer. I still have some copies of the last newsletter available on request to those whose copy is missing in action. Let me know if you know of any disgruntled colleagues who have coveted your copy or have been observed running to the mailbox, only to return disappointed.

