

# LATERAL LINES

VOLUME 14, NO. 1 SEPTEMBER, 1997

#### THE NEWSLETTER OF THE IOWA CHAPTER OF THE AMERICAN FISHERIES SOCIETY

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### PRESIDENT'S CORNER

Congratulations, Thank You, and Farewell!

I would like to congratulate the Chapter's new officers: Joe Morris, President, Dick McWilliams, President-elect, and Mike Steuck, Secretary/ Treasurer. I'm sure that you will lend them the support to run the necessary and various activities of the Chapter during 1997/98.

Also, I would like to thank those that served the past year which include: Joe Morris, Vice-President, Chris Larson, Secretary/Treasurer, and Mark Cornish who has and continues to work diligently at publishing our "near award winning" Chapter newsletter. In addition, I would like to thank all of the members that have served on the various standing and special committees, and to all that have provided special help and advice throughout the past year. And, if anyone feels that I've missed thanking them, I would like to thank you too!

After serving as your Chapter President for the past year, the importance of maintaining a strong, diverse, and active Iowa AFS Chapter is more apparent to me now than ever before. I was very surprised at the number of various groups that come to us for support on a variety of State and National environmental issues and efforts. Some of them were even good ones! So, as your immediate Past-President and new Membership Chair, I bid you farewell, and urge you all to remain involved in AFS activities, and consider inviting someone to join the Iowa AFS Chapter. Together, we can make a difference.

70m Boland



### Missouri Chapter Launches Watershed Initiative

Missouri Chapter members have joined with colleagues in The Wildlife Society, Society of American Foresters, and the Soil and Water Conservation Society to launch a Watershed Initiative aimed at dealing with stream and watershed issues in an organized, holistic way. The groups are using a white paper written and recently revised by the Chapter's Watershed Conservation Committee as a catalyst and starting point to develop the project. Titled "Conservation of Missouri's Watersheds" the document outlines the problems facing these resources and lists ways of implementing a successful watershed project.

"Streams are reflections of their watersheds," said Jim Czarnezki, Chapter president. "To have good quality streams, we need good quality watersheds." Members also are developing a watershed poster and brochure for the public to explain how watersheds influence Missouri streams and what citizens can do to improve streams.

The Chapter is involved in numerous state and national issues, including support for reauthorization of and adequate funding for the Clean Water Act and Endangered Species Act, adequate funding of the National Biological Services; the Teaming With Wildlife Initiative and Water Resources Development Act, the Missouri Clean Water Law (especially restrictions on confined animal feedlot operations), and revision of the Missouri River Master Plan.

### Newsletter of the Iowa Chapter of the American Fisheries Society Volume 14, Number 1

#### Committee Chairpersons

[ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]	
Audit	Joe Larscheid
Membership	Gary Siegwarth
	Marion Conover
REAP	Dick McWilliams
Continuing Education.	Joe Morris
Student Affairs	Hongsheng Liao
Nominations	Mark Flammang
Best Paper	Steve Waters
	y Siegwarth/Tom Boland
Catfish 2000	Tom Boland

#### Newsletter Editor:

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### The AquaNIC: Fish Culture Goes Electric

Billed as "the single most useful internet resource available to today's aquaculturist", the Aquaculture Network Information Center (AquaNIC) is on-line providing instant access to hundreds of documents, government agencies, regional aquaculture centers, dozens of related aquacultural sites, plus job and resume' postings. If you're into raising fish, you will definitely want to surf this page.

The AquaNIC was developed by LaDonn Swann and Mark Einstein and is maintained at Purdue University in the Department of Animal Sciences. Financial support is provided by the Illinois/Indiana Sea Grant Program, the Cooperative Extension Service of Purdue University and the University of Illinois, the USDA North Central Regional Aquaculture Center, and the World Aquaculture Society.

The AquaNIC can by accessed at http://www.ansc.purdue.edu/aquanic/



### First and Last Call for Papers

### Joint Annual Conference of the Iowa Chapters of the American Fisheries Society and The Wildlife Society

Fisheries and Wildlife Issues into the Next Millennium

On January 20-21, 1998, Iowa State Chapters of the American Fisheries Society (AFS) and The Wildlife Society (TWS) will be jointly held on the Iowa State University campus. On the first day the two chapters will meet together from 9:30 a.m.-5:00 p.m. in the Sun Room, ISU Memorial Union (registration is 9:00-9:30 a.m.). There will be business meetings (5:00-6:00 p.m.) for AFS members (South Ball Room) and TWS members (Sun Room). A social hour is now being planned for 6:00-7:00 p.m.; a silent auction will also take place. The two chapters will meet separately on the second day with AFS members meeting in the South Ball Room and the TWS members meeting in the Sun Room from 8:30 a.m.-12:00 noon. Chapter members will pay a registration fee of \$25; students will pay \$5.

On the first day there will be three sessions: Session I (People and Wildlife) will consist of invited speakers; Session II (Water Quality and Habitat Issues) and Session III (Paradigm Shifts in Management) will need presenters from both chapters. On the second day, each chapter will meet separately for a general session. Those AFS members who wish to make a presentation in either Session II or III, or the general session should send their abstract to Joe Morris or Dick McWilliams by November 30; both a hard copy and computer disk are needed.

Those who need to reserve a hotel room for January 20, should contact either the Howard Johnson Express Inn (formerly called the Silver Saddle Hotel) (1-800-798-8363) or the Ramada Inn (1-800-922-7384) by January 7; a block of 50 rooms have been reserved at each motel. Both hotels are located on South Duff Avenue, just off of the Highway 30 bypass. The rate for the Howard

Johnson Express Inn is \$44.00 for one or two guests per room while the rate for the Ramada Inn is \$48 for one person and \$58 for two people; there is a 10% state and local tax. When reserving an hotel room, indicated that you are with the Iowa Wildlife and Fisheries Conference.

#### Deadline

Titles and Abstracts to either Joe Morris or Dick McWilliams by November 30.

Joseph E. Morris
Department of Animal Ecology
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Ames, Iowa 50011-3221
515/294-4622
e-mail: jemorris@iastate.edu

Dick McWilliams
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Boone Research Station
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Boone, IA 50036
515/ 432-2823

#### Abstract Guidelines

Submit your one page abstract either on a 3.5" IBM format disk or by e-mail. Abstracts should include:

- 1. presentation title
- authors names (<u>underline the name of the</u> presenter)
- 3. authors institutional affiliations and addresses
- 4. abstract of presentation

Submissions should be sent in Microsoft Word format (ver 6.0 or older) if possible.



### **AFS-Iowa Chapter Applied Statistics Workshop**

Date: 1:00 - 5:00 p.m. October 22; 8:00 a.m.- 12:00 p.m. October 23, 1997

Location: ISU Campus - 67 LeBaron Hall on October 22 and 241 Science II on October 23

Instructor: Mark Kaiser

Contact: Joe Morris by 10/3/97 if you are interested in attending.

Fee: \$40

**Description:** The primary objective of the AFS Applied Statistical Workshop is to present the basic principles underlying three approaches to the statistical analysis of data, namely the 'Experimental Approach', the 'Model-based Approach', and the 'Bayesian Approach'. For each approach we will discuss the role of randomization, how probability enters the problem, and to what entities inferences are applicable. Concepts presented will be illustrated with examples drawn from fisheries science, such as relating length to weight, dealing with catch per unit effort, and estimating population age frequency distributions.

Reservations: Available at the newly remodeled Howard Johnson-Express Inn (old Silver Saddle motel) who has agreed to hold 15-20 rooms for participants of October 22. The rate is \$44 for one or two guests per room plus 10% tax, phone 800-798-8363. Indicate you are with the "AFS-Statistics" group for this special rate.



### Iowa Chapter Welcomes New Officers

Congratulations go to Dick McWilliams and Mike Steuck, new Iowa Chapter President-elect and Secretary/Treaurer respectively. Dick will be busy arranging the speakers for the upcoming joint meeting with the Iowa Wildlife Society in Ames. If you have a paper you would like to present, please get in touch with him or Joe Morris ASAP. Mike has already started counting our pennies and guarding the famous Iowa Chapter banner, long may it wave! We wish our new leaders luck as they guide our Chapter toward the millennium!!

A note of special thanks goes to Scott Gritters and Don Herrig for throwing their hat into the ring and to Mark Flammang for putting together a first class slate of candidates.



### Update

Catfish 2000 has been aptly named for the two thousand headaches its caused for it's dauntless organizers. Any project this big is going to have it's problems yet Iowa Chapter organizers Tom Boland and Bernie Schonhoff continue to sweat the details on what is developing into a first rate international conference.

As you probably know Catfish 2000 will be on June 22-25 at the Blackhawk Hotel in Davenport, but what you may not know is that the organizers are working hard to keep the registration costs providing first low while still accommodations. Full conference registrants will receive a bound copy of the proceedings plus there will be a special early-bird discount for those registering by March 1. Registration forms will be distributed later this year, stay posted for further news.



### Carp Across America

For those of you taking to the highway who don't want to get too far away from our piscine friends here's a few places that you and your family might find interesting.

The Aquarium for Wildlife Conservation, Coney Island, New York

Home to thousands of fish and a multitude of other wonderful marine creatures including graceful beluga whales, giant sea turtles, playful California sea otters and bottlenose dolphins. West 8th St., Coney Island, Brooklyn, NY 11224. Phone (718) 265-FISH

The Aquarium of the Americas, New Orleans, Louisiana

Exhibits include one of the largest collections of sharks, Gulf of Mexico, Caribbean Reef, Mississippi River and Amazon Rainforest. 1 Canal St, New Orleans, LA 70130. Phone (504) 861-2537

Aksarben Aquarium, Louisville, Nebraska

12,000 square feet includes the aquarium, terrarium, natural history classroom, World Herald Auditorium, orientation and display area, and office space. Phone (402) 332-3901

The Monterey Bay Aquarium, Monterey, California Features the rich marine life found in Monterey Bay, including sea otters and a kelp forest. One of the top-rated aquariums in the country. 886 Cannery Row, Monterey, CA. Phone (408) 648-4888

The National Aquarium in Baltimore, Maryland A large aquarium featuring the Atlantic coral reef, tropical rain forest, sharks, and seal pool. Pier 3, 501 East Pratt Street, Baltimore, MD 21202 USA. Phone (410) 576-3800

The National Aquarium, Washington, DC Established in 1873. It's the oldest aquarium in the country. Hours are 9AM to 5PM every day, except Christmas. There are 80 exhibits, the largest is the 6,000 gallon shark tank. Also seen are alligators and sea turtles. (202) 482-2825. Located in the Department of Commerce Building, Room B-037, 14th and Constitution Avenues, NW, Washington, DC 20230.

Seattle Aquarium, Seattle, Washington

The giant Pacific octopus is one of hundreds of species of invertebrates, fish, birds, and marine mammals featured from Puget Sound and around the world. Pier 59, Seattle, WA 98101 USA. Phone (206) 386-4320

The Shedd Aquarium, Chicago, Illinois

More than 6,000 aquatic animals from every region of the planet. The Oceanarium features beluga whales, Pacific white-sided dolphins, sea otters, and harbor seals in a re-creation of a Pacific Northwest environment. 1200 South Lakeshore Dr, Chicago, IL 60605 USA. Phone (312) 939-2438

South Carolina Aquarium Charleston, South Carolina Located in downtown Charleston on the Cooper River waterfront. 90,000 square feet opening in 1998 with 10,000 animals and 5,000 living plants in 1,000,000 gallons of salt and fresh water habitats.

The Smithsonian Institute, Museum of Natural History, Washington, DC.

Has Caribbean reef and turtle grass ecosystem exhibits. 10th St at Constitution Ave, Washington, DC 20560 USA. Phone (202) 357-2700

The Tennessee Aquarium, Chattanooga, Tennessee The Tennessee Aquarium in Chattanooga is the world's

> largest freshwater aquarium! Journey through a spectacular 60-foot canyon and two living forests, where you'll see over 7,000 animals that swim, fly and crawl in natural habitats. One Broad Street, Chattanooga, TN 37401 Phone 1-800-262-0695

Virginia Marine Science Museum, Virginia Beach, Virginia

The Virginia Marine Science Museum has one of the top 10 attendance in the US. and features a shark tank, sea turtles, seals, sea lions, an aviary and more, even a 3-D Imax theater.



### Iowa Chapter - American Fisheries Society Bylaws

#### Section 1 - Name and Objectives

The name of this organization shall be the Iowa Chapter of the American Fisheries Society, and herein after referred to as the Chapter.

The objectives of the Chapter shall be those of the American Fisheries Society, as set forth in Article 1 of the Constitution, and to encourage the exchange of information by members of the Society residing within the State of Iowa.

#### Section 2 - Membership

Society members in good standing and residing in the State of Iowa are eligible for membership in this Chapter.

#### Section 3 - Meetings

The Chapter shall hold at least one meeting annually at a time and place designated by the Executive Committee. The program and presentation of papers shall be the responsibility of the Program Committee.

#### Section 4 - Officers

The officers of the Chapter shall consist of a President, President-Elect, and a Secretary-Treasurer.

Officers shall be elected at the annual meeting. The Secretary-Treasurer may hold office for a period longer than one year, but the term of the other officers shall be one year. In case of a vacated position, the Executive Committee shall appoint a qualified replacement to fill the unexpired term.

In the event of a cancellation of an annual meeting the officers and the members of any committees shall continue to serve until the next scheduled meeting.

#### Section 5 - Duties of Officers

The President of the Chapter shall preside at all meetings, serve as the Chairman of the Executive Committee, represent the Chapter on the North Central Division Executive Committee, and at the Society Meeting, and shall make such appointments and perform other duties and functions as are authorized and necessary.

The President Elect shall be Chairman of the Program Committee and assume the duties of the President in the event the President is unable to act.

The Secretary-Treasurer shall keep the official records of the Chapter, collect and be custodian of fees collected under Section 9 of these bylaws, and any funds which may be allocated to the Chapter. The Secretary-Treasurer shall disburse funds as directed by the Membership or the Executive Committee and shall submit a record of receipts and disbursements by the Executive Director of the American Fisheries Society and the President of the North." Central Division.

#### Section 6 - Executive Committee

The Executive Committee of the Chapter shall Consist of the elected officers and the immediate Past-President. The committee is authorized to act for the Chapter between meetings and to perform appropriate duties and functions.

#### Section 7 - Chapter Committees

Committees and their Chairmen, except as listed in Section 5 of these bylaws may be appointed by the President as may be necessary for the conduct of the Chapter activities. Standing committees shall include Auditing, Membership, Public Awareness, and Nominating Committees.

The terms of office for members of Chapter Committees shall end upon the discharge of the duties for which they were appointed, or at the next annual meeting of the Chapter, whichever comes first.

#### Section 8 - Voting and Quorum

Decisions at meetings of the Chapter shall be by a majority of those present at any meeting, except for the amendment of these bylaws, as shown in Section 10.

#### Section 9 - Fees

The Executive Committee may assess fees necessary to cover the costs of the meeting and Chapter activities. To increase the effectiveness of the Chapter, a list of interested persons not yet members of the American Fisheries Society will be established as "Friends of the Iowa Chapter". Those persons who wish to have their names on such a listing will be required to pay a fee to cover mailing, meeting attendance, and other related costs. The fee shall be established by the Executive Committee on a yearly basis.

#### Section 10 - Amendments of the Bylaws

The Bylaws of the Chapter may be amended by a 2/3 majority vote of approval by those members voting at the annual meeting, provided that prior notice of at least 30 days be given to the membership of the proposed change(s). Said change(s) must be approved be the Executive Committee of the Society before taking effect.



### FDA Prohibits Extra-Label Use of Two Compounds

The Food and Drug Administration (FDA) has prohibited all extra-labeluse of fluoroquinolones and glycopeptides. FDA published the order of prohibition in the May 22, 1997, issue of the Federal Register.

The FDA issued the order because some extra-label uses in food-producing animals may increase the level of drug resistant zoonotic pathogens, which are ineffective to humans.

### FDA prohibited extra-label use drugs

- 1. Chloramphenicol
- 2. Clenbuterol
- 3. Diethylstilbestrol (DES)
- 4. Dimetridazole
- 5. Ipronidazole
- 6. Other nitromidazoles
- 7. Furazolidone
- 8. Nitrofurazone
- Sulfonamide drugs in lactating dairy cattle
- 10. Fluoroquinolones
- 11. Glycopeptides

The order restricts use of these antibacterial compounds to "the exact use specified on the label and that only. (They may be used) only for whatever use and whatever species is stated on the label," explained Rosalie Schnick, national coordinator for aquaculture new animal drug applications.

This doesn't represent a new direction for the FDA, Schnick said. Rather, FDA "is codifying what has been unwritten policy for some time. Since August 1995, FDA has informally asked veterinarians to voluntarily refrain from extra-label use of these drugs in food animals."

Fluoroquinolones and glycopeptides joined nine other categories of drugs that are prohibited for extra-label use.

Schnick explained that the aquaculture industry will find the prohibition against exrta-label use of fluoroquinolones important because sarafloxacin fall into the fluoroquinolone category. Sarafloxacin is one of the compounds that the aquaculture industry considers a priority for which to obtain approval.

Schnick said that she was "still hopeful that sarafloxacin would gain approval for control of enteric septicemia in catfish. The new regulation doesn't affect the ability of sarafloxacin to be approved, only its extra-label use. This ruling also does not mean that FDA has determined sarafloxacin to be an unsafe drug. Safety is determined during the approval process, and no adverse effects have been noted concerning sarafloxacin during the generation of all the safety data requirements."

The prohibition took effect August 20, 1997. The Federal Register issue with the prohibition can be viewed or downloaded from the CVM Website at http://www.cvm.fda.gov/. In addition, paper copies can be obtained by contacting Communications Staff, FDA/CVM, HFV-12, 7500 Standish Place, Rockville, MD 20855, phone 301-594-1755.

Condensed from Regional Notes, Vol. # 8 No. #4, Summer 1997, Center for Tropical and Sub Tropical Aquaculture, Waimanalo, HI.







### New Exotic in Georgia

The Asian eel (Monopterus albus), a descendant of exotic aquarium pets set free in the wild in the United States, is adapting, reproducing, and making itself at home in several south Georgia ponds. The eel, a flesh-eating predator that can grow as long as 3 feet, was found in three ponds thus far. Officials fear this exotic predator may soon find its way into Georgia's streams and rivers and from there infest not only Georgia but Alabama and Florida as well.



### New Depredation Prevention Pamphlet Published

The Jack H. Berryman Institute for Wildlife Damage Management and the International Association of Fish and Wildlife Agencies has published a pamphlet entitled "Overview of Techniques for Reducing Bird Predation at Aauaculture Facilities." Written by two graduate students and a professor at Utah State University, this publication provides techniques for reducing bird damage and includes topics such as barriers, frightening techniques, and the location and design of a facility. At the end of the pamphlet, there is a listing of Animal and Plant Health Insection Service's (APHIS) Wildlife Services (WS) regional offices and companies that provide devices for depredation management. Strangely, Remington, Browning, and Winchester are not listed.





### Mycobacteria in Fish

Recent events in Florida have focused the public's attention upon a bacteria from the genus Mycobacterium that has been appearing in freshwater snook in Sarasota. The University of Florida's Cooperative Extension Service has released a factsheet called "Mycobacteriosis in Fish" that discusses the disease. Three species of Mycobacterium have been reported to cause disease in fish: M. marinum, M. fortuitum, and M. chelonei. Among fish, the most common method of transmission is ingestion. This can occur when fish are fed fish products that are not properly cooked or when dead fish are not promptly removed from the population. Because there is no effective treatment for mycobacterial infection of fish, it is best to destroy infected stocks immediately.

If you would like a copy of factsheet UM 96, contact Andy Rose with the University of Florida's Cooperative Extension Service, 3600 South Florida Ave., Inverness, FL 34450, 352/726-2141.

### Would you like to become an Iowa Chapter AFS Member?

To join, fill out the information below and send a \$5.00 check (payable to the *lowa Chapter AFS*) to:

Mike Steuck Sec/Treas. Iowa DNR 206 Rose Street Bellevue, IA 52031

Name:		
Street:	<del>-</del> 7111	
City:	State:	Zip:
Phone:	Fax:	

## Cat Scratch Fever

Match the Common Name to the Scientific Name

	Common Name		Scientific Name
1	Stone Cat 👌	Α.	Ictalurus furcatus
2	Channel Catfish ®	В.	letalurus natalis
3	Slender Madtom 🤄	Ø.	Ictalurus melas
4	Blue Catfish 🜾	D.	Ictalurus punctatus
5	Black Bullhead 🗅	E.	Noturus nocturnus
6	Freckled Madtom	F.	Noturus exilis
7	Yellow Bullhead 6	G.	Noturus gyrinus
8	Flathead Catfish 1/2	н.	Noturus flavus
9	Tadpole Madtom 6	K.	Pylodictus olivalis
10	Brown Bullhead	J	Ictalurus nebulosus

1 correct: wiseacre; 2 - 3 greenhorn; 4 - 5 bourgeoisie; 6-7 "2.75 cumulative GPA"; 8-9 highfalutin; 10 white hot



## Brain Teasers

The Order of the Walleye were getting for their annual week-long gillnetting operation on Clear Lake. The committee appointed the new technician to get the supplies. The tech went into the store in Mason City and bought six cases of whiskey, twelve kegs of beer and a package of hotdogs. When the tech returned, the committee looked in the truck and the chairman asked, "what the heck are we gonna do with all them hotdogs?"



True hell is when the devil tells you that you can have beer or bait but you can choose only one!



A boy and his family are sitting at the table having a nice fish dinner when the boy's father exclaims, "Gee Billy, you and your brothers really caught a lot of fish today." To this Billy replied, "we didn't eatch these Dad, they were floating on the top."



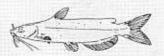
A person walks into a store and says to the clerk, "I'd like a Black Max reel with goldcast line, a black & gold hat, some black & gold boat cushions, ten black spinner baits with gold willow leaf blades, and a black & gold tackle box." The clerk behind the counter said, "Why, you must be a Hawkeye fan." The customer said, "How could you tell? Was it because everything I wanted was black & gold?". "No" said the clerk, "its because you are in the bakery - the tackle store is across the street!"

## You Caught Me!

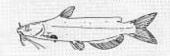
What are these traps used for?

Name of Trap		Target
Brown Sampler 1+	Α,	Larval Fish
110 Conibear €	-В.	Water
Kemmerer Sampler B	C-	Encrusting invertebrates
Multiple-plate Sampler	Ð.	Fish
Clark-Bumpus Sampler	E.	Muskrats
Quatrefoil Trap 🚳	F.,	Zooplankton
Fyke Net 1)	G.	Mussels
Braille G	H.	Benthic Invertebrates





### Meetings of Interest



Oct 4–8 AFS Southern Division Annual Meeting. Oklahoma City, Oklahoma, Contact Bill Fisher, Oklahoma Cooperative Fish and Wildlife Research Unit, 404 Life Sciences West, Oklahoma State University, Stillwater, OK 74078; 405/744-6342; FAX 405/744-5006

Oct 21-22 UMRCC Water Quality Section Meeting, Butterworth Center, Moline, Illinois. Contact Matt Short, Illinois EPA, 4500 South 6th St. Rd., Springfield, II, 62706; 217/785-6892; FAX 217/786-6357

Dec 6-10 Annual Meeting of the AFS North Central Division. Milwaukee, Wisconsin. Contact Doug Beard, FH/4, P.O. Box 7921, Madison, WI 53707; 608/267-9427; FAX 608/267-7857

Jan 1998 Iowa AFS- Wildlife Society Joint Meeting. ISU Student Union, Ames. Contact Joe Morris, Department of Animal Ecology, 124 Science II, Iowa State University, Ames Iowa 50011-3221; 515/294-6148 FAX 515/294-7874 Feb 19-21, 1998 Whirling Disease Symposium. Colorado State University, Fort Collins. Contact Whirling Disease Foundation, P.O. Box 327, Bozeman, MT 59771-0327; 406/585-0860; FAX 406/585-0863; whirling@mcn.net.

Jun 23-28, 1998 First International Ictalurid Symposium: Catfish 2000. Davenport, Iowa. Contact Steve Eder, Missouri Department of Conservation, P.O. Box 180, Jefferson City, MO 65109-0180; FAX 573/526-4047

Aug 30-September 2, 1999 The 129th Annual Meeting of the AFS. Adams Mark Hotel, Charlotte, North Carolina. Contact Paul Brouha; AFS; 5410 Grosvenor Lane, Suite 110; Bethesda, MD 20814-2199; 301/897-8616 ext. 209; FAX 301/897-8096

Jan 1999 Iowa-Wisconsin Joint Annual AFS Chapter Meeting. Dubuque area. The groundwork for this meeting is still being laid, stay posted for further details!

The American Fisheries Society supports the conservation of North America's fisheries and aquatic ecosystems by promoting professional excellence in fisheries science, management, and education.



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