

**U.S. GEOLOGICAL SURVEY  
RESEARCH/DEVELOPMENT SCIENTIST RECORD**

Please Circle One:

Research Grade Review (RGE)

Equipment Development Grade Evaluation (EDGE)

- (1) NAME Scott A. Bonar
- (2) DATE PREPARED July 15, 2013
- (3) DUTY STATION AZCFWRU, Tucson, AZ
- (4) REGION Western
- (5) CLASSIFICATION TITLE, SERIES, AND GRADE Research Fisheries  
Biologist, GS-0482-14
- (6) DATE OF ENTRANCE ON DUTY TO FEDERAL SERVICE July 1, 2000
- (7) DATE OF LAST PROMOTION October 2008
- (8) DATE OF LAST RESEARCH or DEVELOPMENT PANEL REVIEW  
May 2008
- (9) EDUCATION

School	Major	Dates Attended	Degree
University of Evansville	Secondary Science Education	8/79 – 5/83	B.S. 1983
University of Washington	Fisheries	10/83 – 8/90	Ph.D. 1990

(10) TECHNICAL TRAINING RECEIVED

- *PADI Open Water Diver; PADI Advanced Open Water Diver, University of Washington Research SCUBA Diver Training* – Evansville, Indiana; Seattle, Washington; took a variety of dive training courses 1983-1992 (1-more months each)
- *Piscicide Applications* - Boise, Idaho, August 18-20, 1992. Presented by the U.S. Fish and Wildlife Service and Instructors from Auburn University, and Utah DNR (3 days)
- *Warmwater Fisheries Management Short Course* - Auburn University, Alabama, May 18-23, 1993 (6 days)
- *Warmwater Fisheries Management Short Course* - Bend, Oregon, June 29-July 1, 1993. Presented by the U.S. Forest Service, Faculty of Auburn University and Oregon State University (3 days)

- *Entry Management Development Program (Supervisor's Course)* - Olympia, Washington, September 28-October 1, 1993. Presented by the Washington State Department of Personnel (1 week)
- *Principles and Techniques of Electrofishing* - Olympia, Washington, June 27, 1995. Presented by the U.S. Fish and Wildlife Service (2 days)
- *U.S. Coast Guard Power Boating Course* - Seattle, Washington, 1995 (12 weeks)
- *Warmwater Fisheries Management for Pacific Northwest Biologists*, Olympia, Washington, June 28-29, 1995. Presented by Faculty of Auburn University, Alabama (2 days)
- *Technical Writing* - Olympia, Washington, September 9-11, 1996. Presented by the Washington State Department of Personnel. (3 days)
- *Biometrics Workshop* - Olympia Washington, January 1998. Presented by the Northwest Indian Fish Commission and the Washington Department of Fish and Wildlife Biometrics Unit. (1 week)
- *Warmwater Fisheries Sampling, Assessment and Management* - Olympia, Washington, August 3-6 1998. Presented by the U.S. Fish and Wildlife Service and South Dakota State University. (1 week)
- *Desert Safety*- Tucson, Arizona, Fall 2000. Presented by staff at the University of Arizona. (1 day)
- *Cooperative Research Units Orientation Session* – Reston, Virginia, April 17-18, 2001. Presented by the U.S.G.S. Cooperative Research Units Headquarters Staff. (2 days)
- *U.S. Department of the Interior Motorboat Operators Training Course* – San Carlos, Arizona, 2001. (3 days)
- *Arizona Game and Fish Department Agency School* – Flagstaff, Arizona, June 12-14, 2001. Attended courses in Genetics, Water Law, Customer Service, Arizona Habitat presented by various university and state instructors. (2 days)
- *Basic GIS Techniques for Fish Biologists* – American Fisheries Society Short Course, AFS Annual Meeting, Baltimore, Maryland, August 18, 2002. (1 day)
- *Leadership Development Program* – USFWS National Conservation Training Center, Shepherdstown, West Virginia, February 3-7, 2002. (1 week)
- *Arizona Game and Fish Department Agency School* – Flagstaff, Arizona, June 2003. Attended courses in Negotiation, Waterfowl Identification, Predator Management presented by various university and state instructors. (2 days)
- *Principles of Electrofishing* – American Fisheries Society Short Course, AFS Annual Meeting, Quebec City, Canada, August 8-9, 2003. (2 days)
- *Introduction to Structured Decision Making* – USFWS National Conservation Training Center, Shepherdstown, West Virginia (1 week)
- *Model based inference in the life sciences*, University of Arizona Workshop Presented by Visiting Scientist David Anderson (3 days)
- *Drupal Web Development Programming* – University of Arizona, July 1 - August 30, 2011 (8 weeks).
- *IT Security, Ethics, and related courses* – took a variety of on-line courses in these areas as required by the Department of Interior. 2000-2008 (1hr – ½ day each)

(11) PROFESSIONAL EXPERIENCE

a. PRESENT ASSIGNMENT

DATES From: July 1, 2000 To: Present

*Unit Leader and Associate Professor, USGS Arizona Cooperative Fish and Wildlife Research Unit, Tucson, Arizona. Research (65%), Research Unit and Team Administration (35%) – Supervisor: Joseph Margraf.*

- Lead Cooperative Fish and Wildlife Research Unit, collaborating with State and Federal agencies to conduct aquatic and terrestrial natural resources research. Scope of unit activities since becoming leader (July 2000), \$12,234,494 research funds obtained by unit, over 250 projects supported, 2 “Best in Nation” awards, 63 graduate students or post-docs current or graduated, 236 peer-reviewed articles, books, book chapters or technical reports published by Unit; 38 University courses, 27 agency short courses taught by unit staff.
- Lead and coordinate actions of national or international research teams consisting of scientists from this institution and other agencies, academic institutions, or organizations to investigate critical issues in standard sampling techniques, western fisheries management or natural resources communication.
- Supervise management of three fisheries laboratories, an outdoor storage and experimental facility, equipment (boats, trucks, etc.), and office space.
- Supervise two assistant/associate professors, an administrative assistant, biologists, post-docs, technicians and graduate students.
- Work with leadership of the Arizona Game and Fish, U.S. Fish and Wildlife, University of Arizona staff and other organizations to prioritize research issues most important to management.
- Design, obtain funding and direct aquatic research projects of national and international significance including: Standard methods for sampling freshwater fish across North America, communication strategies among conservation professionals and between conservation professionals and the public; methods to diagnose problems in fish communities (introduced species, habitat degradation etc.) and manage recovery; captive breeding of threatened and endangered desert fishes, effects of water temperature on fishes of the western United States and Mexico; management and recovery of western fishes.
- Taught graduate courses in Communication and Public Relations for Natural Resource Professionals, Advanced Fisheries Management, Fisheries Management, and Fisheries Seminars.
- See Section 12(a) for specifics on recent research accomplishments.

b. PREVIOUS PROFESSIONAL POSITIONS

DATES From: July 1994 To: June 2000

*Unit Leader – Inland Fisheries Research Unit, (Biologist 3,4, Research Scientist 1), Washington Department of Fish and Wildlife, Olympia.* Directed inland fisheries research for WDFW. Supervised up to nine scientists and technicians conducting research used to develop state laws and policies. (70% Research)

DATES From: July 1992 To: July 1994

*Team Leader-Warmwater Fisheries Research Team, Biologist 3, Washington Department of Fish and Wildlife, Olympia.* Directed warmwater fisheries research for WDFW. Supervised four scientists and technicians conducting research used to develop state laws and policies. (70% Research)

DATES From: August 1990 To: July 1992

*Fisheries Research Biologist 3, Washington Cooperative Fish and Wildlife Research Unit, University of Washington, Seattle.* Supervised, designed, analyzed experiments in lake restoration and warmwater fisheries research. Managed staff of 5-8, wrote publications, presented research. (80% Research)

DATES From: June 1989 To: August 1990

*Fisheries Biologist 3- Ph.D. Candidate, Washington Cooperative Fish and Wildlife Research Unit, University of Washington, Seattle.* Designed, supervised, and analyzed field and lab experiments in lake restoration, fish feeding behavior, aquatic plant control, fisheries management. (80% Research)

DATES From: October 1983 To: June 1989

*Research Assistant – Ph.D. Student, Washington Cooperative Fish and Wildlife Research Unit, University of Washington, Seattle.* Designed and conducted research on first legal grass carp stockings in Pacific Northwest. Bypassed M.S. and proceeded directly to Ph.D. program because of high work quality. (80% Research)

DATES From: Summers 1979 To: Summers 1983

*Agricultural Research Worker, Pioneer Hi-Bred Incorporated, Corn Research Station, Princeton, Indiana.* Evaluated susceptibility of various corn strains to disease, water damage, and insect damage. Research results used to improve strains of corn for agricultural production. (90% Research).

## (12) SIGNIFICANT RESEARCH or DEVELOPMENT ACCOMPLISHMENTS

I have participated in over 70 research projects concerned with resident, marine or estuarine fisheries biology and management, and fish and habitat survey methodology. This has resulted in 152 publications (2 books, 5 book chapters, 48 peer-reviewed journal, 17 agency peer-reviewed, 11 symposium, 12 popular, 56 technical reports, 1 dissertation). I was lead author on 72 publications. Study results from this research were used to develop 14 state laws, policies and management plans in the western United States related to fisheries and aquatic sciences. I have 27 publications (1 book) and 1 computer program since my last promotion.

### a. RECENT ACCOMPLISHMENTS - Within Last 5 years

#### **Led International Effort to Standardize North American Freshwater Fish Sampling.**

**Background:** -- Standardization in industry, medicine and science has led to great advances. However, freshwater fish sampling was generally unstandardized, or at most standardized locally. Standardization across large regions allows for measurement of large-scale effects of climate or geography on fish populations; larger sample sizes to evaluate management techniques; reliable means to document rare species; easier communication; and simpler data sharing. Development of standard sampling methods across North America has been of interest for decades.

**Role:** -- I led international efforts for the first text of continent-wide standard freshwater fish sampling methods in the history of fisheries science. I was lead editor of book, authored two chapters, chaired AFS Standard Sampling Committee, Fisheries Management Section. I obtained funding from 10 federal, state and private agencies and coordinated work of 2 coeditors and 284 authors, reviewers and sponsors from 107 agencies, universities, private industry and organizations from across Canada, Mexico and the US. I used social research reported in *The Conservation Professional's Guide to Working With People* (29) to help arrive at consensus and complete project successfully. Following book publication, I led team of three programmers to develop a web-based tool to analyze standard fish data with a simple click of a button. Web development was collaborative among AFS, two Universities and three agencies.

**Results:** -- *Standard Methods for Sampling North American Freshwater Fishes* (14) describes AFS recommended methods and gear types to sample fish in specific environments so population indices can be more easily compared across regions and time. The book also provides other information necessary for standard sampling programs such as tables of comparison data averaged from over 4000 data sets from 42 states and provinces; methods to convert nonstandard to standard data; statistical and database procedures for standard sampling, gear calibration methods, and methods to prevent transfer of invasive species while sampling. <http://fisheriesstandardsampling.org>

(1) allows users to quickly compare condition, growth and abundance of fish collected in a particular waterbody with rangewide, ecoregion and state averages and percentiles based on thousands of data sets collected across North America; (2) allows easy entry of new standardized data, enabling crowd sourcing to constantly improve summaries.

**Impact:**-- (1) Book consistently in top 1-4 bestsellers of AFS since publication in 2009; (2) methods being adopted by numerous state, provincial, federal agencies, across North America (3) Work subject of 3 international symposia: AFS Annual Meetings in Ontario, Minnesota (standing room only); World Fisheries Congress, Edinburgh Scotland, U.K., (4) I was invited to give keynote addresses on project at 2 international fisheries sampling meetings in the Czech Republic, and address the European Committee for Standardization (CEN) in London, which consists of fisheries biologists from countries across Europe. (5) Methods now subject of considerable research by others – validation, calibration studies, computer intensive techniques (6) Unanimous vote from AFS Fisheries Management Section to increase international scope of standardization, collaboration outside N.A. currently underway; (7) <http://fisheriesstandardsampling.org> invited for demonstration at AFS Annual Meetings in Minneapolis and Seattle; and at workshops and symposia at various AFS Division Meetings. Fisheries biologists from some state agencies required by management to attend.

#### **Developed Methods to Captively-Breed Threatened and Endangered Desert Fishes.-**

**Background:** -- Captive breeding has been important to preserve critically endangered animals such as California condor and black-footed ferret. Most desert fishes - imperiled through human activity- are in grave danger of extinction. For example, Devil's Hole pupfish supposedly has the smallest distribution of any vertebrate, only 35-100 individuals in existence, and was important for US endangered species legislation - its preservation argued up to the US Supreme Court. Other desert fishes are only slightly less endangered. Captive breeding doesn't replace restoration of wild habitats, but sometimes is the only way to preserve species while habitats are restored. Some species notoriously hard to breed. Previous attempts for Devils Hole pupfish at San Francisco's Steinhardt Aquarium; Las Vegas' Mandalay Bay Aquarium; USFWS all unsuccessful.

**Role:** -- Led team of staff/students to develop propagation techniques for 7 T&E desert fish species, critical to conservation efforts of USFWS and National Park Service (NPS).

**Results:** -- Successfully developed techniques for 6 of 7 species reported in (7,17,22,24,33). Staff engineered facilities most conducive to propagation, allowing wild conditions to be replicated. This includes development of 11,360-L Devil's Hole replica which mimics temperature, substrate, lighting, tidal fluctuation, DO, other parameters.

**Impact:** -- (1) Techniques used by USFWS, NPS to breed many of the fishes; (2) Received 2013 Award from USFWS Pacific Southwest Region for research on captive propagation and ecology of Devils Hole pupfish and assistance in commissioning new USFWS Ash Meadows NWR Aquatic Conservation Facility (Ash Meadows NV/CA reportedly has the highest number of endemic species in such a small area in North America) (3) The \$3 million desert fish conservation facility was built near Death Valley, primarily for Devils Hole pupfish – USFWS consulted heavily with our team on construction design and hired one of our staff/students to run it.

**Led projects to research desert fish habitat needs and restoration techniques.**

**Background:** -- For agencies to manage for climate change and human demands on desert water, habitat needs of fishes need quantification and restoration options investigated.

**Role:** -- I supervised staff/students teams to: (1) research effects of increasing water temperatures on 19 fishes of the Southwest. (2) test effects of US Border Operations on T&E fishes in streams crossing the US/Mexico border; (3) develop habitat suitability criteria for desert fishes to support USFS litigation to protect water rights of stream fishes from mining activity; (4) investigate methods to cool streams through habitat alteration.

**Results:** -- (1) We designed and built a computerized 36-aquarium facility featured in (34) to replicate natural thermographs and test effects of fluctuating and long-term, chronic temperature increases; (2) estimated temperature tolerances of 19 desert fishes (1,4,24,30,34,38,40,52,58). (3) developed habitat suitability criteria for desert fishes (10); (4) initiated research on effects of US/Mexico border operations on T&E fish habitat.

**Impact:** -- (1) Research results being used by state and federal agencies to develop temperature criteria for streams. (2) scientist was retained as an expert witness in US DOJ litigation to protect water rights for native aquatic species in Arizona streams – one stream labeled as the most intact native fish community in Arizona (3) results from habitat suitability studies being used by USFS and others in litigation (4) one publication from this research was a top-ten viewed article in AFS journals. (5) information on border operations to be used by USFWS to help mitigate or modify border activities (6) stream cooling investigations to be used by AZGFD, USFWS, and USFS to conserve Apache trout habitat.

**Developed Management Strategies and Evaluated Effects of Introduced Fishes in Western United States.** -- I led several research studies evaluating management and biology of introduced fishes in the western United States. Specific projects include:

**(1) Mechanical methods to control introduced northern pike in Arizona lakes.**

**Background:**--Control methods needed for Northern pike, a voracious introduced predator in Arizona lakes.

**Role:** -- Funded by USFWS and AZGFD to recruit and supervise scientists from the Ukraine, where mechanical methods have collapsed northern pike populations. Ukrainian scientists came to Arizona and we tested both US and Ukrainian methods to capture nuisance pike in AZ lakes.

**Results:** -- A variety of methods, reported in (11), were 60-90% effective.

**Impact:** -- (1) Methods being used by AZGFD to control northern pike in AZ lakes. (2) I was invited to speak at the Environmental Security Council at NATO headquarters in Brussels, Belgium on research with these Ukrainian scientists (11,15,26), and investigate potential for further collaboration.

**(2) Effects of Asian tapeworm on small desert fishes.**

**Background:** -- Asian tapeworm is an introduced parasite that has resulted in up to 90% mortality in pond fishes in its former range (Eurasia). It supposedly affects cyprinids in warm water to the greatest extent, some of the most endangered fishes in the Southwest.

**Role:** -- Funded by NPS and USFWS to examine effects of Asian tapeworm spreading throughout Southwest. Led research team of staff/students, investigating waters in Mohave and Sonoran Deserts of California/Arizona, and conducting laboratory research.

**Results:** -- Field and laboratory results presented in (5,9,17,28,32). Spread of tapeworm across Southwest substantial (9,35). Effects of tapeworm initially intense, but populations decline over time (9,28,32). Some treatment methods leave possibility eggs may be transported (17). We developed novel pond treatment methods (5).

**Impact:** -- Study results used by management agencies to estimate effects of Asian tapeworm, manage shipments of fish, and potentially treat pond systems.

Studies currently underway include **Optimizing control methods for northern crayfish**, which uses population viability analysis to determine effective times and methods to control introduced northern crayfish, **Captive propagation and spawning ecology of Moapa dace**, a critically endangered fish from Nevada's USFWS Moapa NWR; and **Habitat suitability analysis for Apache trout and crayfish**, investigating if habitat alteration can be used to affect the numbers of crayfish in Apache trout habitat. All funded by state and federal agencies and to be used in their management strategies.

## **b. OTHER CAREER ACCOMPLISHMENTS**

### **Researched and Authored Book on Communications Techniques for Natural Resources Professionals.**

**Background:** -- Because human behavior is so critical for natural resource conservation, researching and mastering skills to alter human behavior is critical for all conservationists. To help scientific researchers and agency personnel become more effective in the social arena, I researched social science and historical information to compile effective techniques used by the most successful conservationists, government workers and scientists. **Role:** -- I observed communication habits of successful conservationists for over 20 years; studied hundreds of pages of historical accounts of past successful conservationists and conservation events; and researched successful practices used to better communication and increase efficiency in business, government and science to aid conservation professionals in the social arena. **Results:** -- I authored a 2007 book based on these research results entitled *The Conservation Professional's Guide to Working With People* (29). **Impact:**-- This text was called "a must-read for the conservation professional" by the journal *Ecology*; "reassuring, wise, and entertaining guidance" by Paul R. Ehrlich, Bing Professor of Population Studies, Stanford University and author of *The Population Bomb*; a "guidepost" that "should be a part of college curricula in every natural resources program", by Mamie Parker, Assistant Director of the USFWS; and "required reading for all my graduate and undergraduate students. I am just sorry it was not available earlier" by a reviewer in *Quarterly Review of Biology*. "Will raise your skills--personal and professional-- to a higher level." *Ecological Restoration*. I presented workshops on the techniques at US Fish and Wildlife Service Headquarters, Arlington; a USGS national webinar series; Arizona Game and Fish Department; Texas Parks and Wildlife; Montana AFS; National Arbor Day. Contributed workshop at AFS annual meeting, San Francisco. The book is used in human dimensions courses across the nation and is currently listed by Google in 459 libraries across the world. Because of



this work, I was invited to lead author chapter on *Communication in Fisheries* for the latest edition of *Inland Fisheries Management in North America*, currently a lead best-seller at AFS.

### **Identified Factors Associated with Distribution and Relative Abundance of Introduced Fishes Across the American West.**

**Background:** -- Western streams are inhabited by introduced fish, but the full extent of this was not known. **Role:** -- I led efforts to use data from the largest standardized survey of Western streams to date (approx. 900 sites) to examine factors related to relative abundance and distribution of introduced fishes in 12 Western states. **Results:** -- The study, published in the *North American Journal of Fisheries Management* (41), found one fourth of fish in the West were nonnative and about 50% of Western stream km were inhabited by nonnative fishes. **Impact:** -- Was the 2nd most viewed publication in all AFS journals when published, and featured in a USGS national press release.

### **Assessed Impacts of Nonnative Fish Predation on Native Fishes of a Desert River.**

**Background:** The Verde River is important habitat for native fishes that is occupied by a variety of nonnative species. Management agencies needed information to manage the interactions. Few studies had evaluated predation of nonnative fishes across an entire river system, especially a desert ecosystem. **Role:** -- I was principal investigator of a study employing 259 students, staff and volunteers that evaluated impact of nonnative fish on native fishes of the Verde. **Results:** -- The study, conducted over the entire 300 km river, combined bioenergetics and population estimation techniques (45). **Impact:** -- Information used by AZGFD and USFWS to determine management strategies for desert rivers. One USFWS Ecological Services biologist told me he uses his dog-eared copy continuously.

### **Evaluated Impact of Competition and Predation of Introduced Fishes on Coho Salmon Using Shallow Pacific Northwest Lakes.**

**Background:**--Declines in Pacific salmon stocks have been blamed on hydropower, overfishing, ocean conditions and land-use practices, but less is known about the impacts of nonnative fish, especially in small standing waters important for salmon rearing. Over 450 lakes provide rearing habitat for juvenile salmon in western Washington alone. **Role:** -- I led a team examining effects of introduced fishes on wild coho salmon in shallow western Washington lakes. **Results:** -- Largemouth bass were responsible for an average of 98% of the predation on coho salmon in studied lakes. Largemouth bass are found in > 75% of lowland warmwater lakes in Washington, Oregon, and in eight northwestern counties of California, many important for coho salmon rearing. This research showed that predation by largemouth bass could significantly affect juvenile coho salmon survival in these systems (39). **Impact:** -- Research used by USFWS, Canadian Government, and State Agency biologists to manage lakes across the Pacific Northwest used by anadromous salmon. In top ten viewed articles in *North American Journal of Fisheries Management*. Presented at regional, national and international conferences.

### **Evaluated Efficacy of Triploid Grass Carp for Aquatic Plant Control in Pacific Northwest.**

**Background:**--Management agencies wished to use grass carp for aquatic plant control in Pacific Northwest ponds and lakes. **Role:** -- I conducted my dissertation work and led a team at WDFW to research effects. **Results:** -- Research on sterile triploid grass carp in the Pacific Northwest was presented at many national and international conferences and in journals. **Impact:**-- Research used to develop legislation and management policies regarding this species in Washington, Oregon, British Columbia and Montana (56,65,67,69,70,72,73,74,89,106,107,121, many others). Research among first to investigate use of this species for aquatic plant control in northern climates in North America. Recognized as an important contribution nationally and internationally by both the scientific and management community.

**Published Many Other Studies on the Biology, Management and Sampling of Western Fishes Affecting State Laws, Policy and Management Strategies Across the West.** These included: Relative length frequency: A simple, visual technique to evaluate size structure of fish populations (55); Biology and impacts of northern pike introduced into Arizona lakes (27); the first relative weight equations for native desert fishes (46); effects of water temperature on the predation susceptibility and swimming performance of flannelmouth sucker (52); factors associated with razorback sucker recruitment in small southern Arizona ponds (53); effects of flooding on abundance of native and nonnative fishes downstream from a small impoundment (51); sampling protocols for endangered bull trout (57); standard methods to sample fish in Washington state lakes and ponds (64); identifying factors influencing survival of stocked channel catfish in Washington lakes (79); developing management strategies for largemouth bass in Washington (62,77,83); examining effects of trout stocking regimes on amphibians in high mountain Washington lakes (63); and developing management recommendations for burbot in Washington (61).

### **(13) SCIENTIFIC LEADERSHIP**

When I entered the Unit Program at the Arizona Cooperative Fish and Wildlife Research Unit in July 2000, all positions were vacant (unit leader, two assistant unit leaders, all technical staff) with the exception of one administrative secretary. First as Acting Unit Leader, then as Unit Leader, I worked with state and federal cooperators to hire two additional faculty (assistant unit leader wildlife, assistant unit leader fisheries), attract grants, recruit staff and hire and finish graduate students. Three years later the Arizona Cooperative Fish and Wildlife Research Unit was fully staffed and had attracted \$2,740,592 in research grants during this three-year period. Scope of unit activities since becoming leader (July 2000), \$12,234,494 research funds obtained by unit, over 250 projects supported, USGS Cooperative Research Unit national awards for Excellence in Customer Service in 2005 and Outstanding Science in 2007 (These awards are given throughout the entire Unit system for best cooperator relations in the nation, and for the best science in the nation), 63 graduate students or post-docs current or graduated, 236 peer-reviewed articles, books, book chapters or technical reports published by Unit; 38 University courses, 27 agency short courses taught by unit staff.

Since my last promotion, in my aquatic research program alone, five MS/Ph.D. thesis have been completed, I have lead or coauthored 67 presentations at regional, national and international conferences and meetings, and I gave 4 keynote addresses at local, national and international scientific conferences. The numbers and types of publications were discussed in (12) above.

I have lead international research projects, coordinating work of over 284 state, federal and private scientists from 107 agencies across the United States, Canada and Mexico to develop standard fish sampling methods for North America. I was invited to give plenary talks at international conferences in the U.K., and the Czech Republic, along with numerous talks, workshops and plenary presentations at annual AFS, state and federal biologist/managers' meetings (see 14 below). I chaired 5 international symposia. I was approached by scientists of the former Soviet Union to be a principle investigator on joint research on piscivorous fish management (northern pike). These scientists came to the United States to conduct research under my leadership. NATO funded me to meet with scientists at the Ukrainian Institutes of Hydrobiology and Fisheries in Kiev, and at Zaporizhazha State University, Zaporizhazha to develop a joint research proposal on northern pike management.

I have also served in leadership positions in several scientific societies, most notably President of the Western Division of the AFS and President of the AFS Introduced Fish Section (please see below in 14a).

#### (14) SCIENTIFIC AND PUBLIC SERVICE

##### a. MEMBERSHIPS IN PROFESSIONAL SOCIETIES

###### **American Fisheries Society**

- **President, Introduced Fish Section, American Fisheries Society** (August 2012 - August 2014). International section of AFS devoted to management and study of nonnative fishes.
- **President Elect – Introduced Fish Section, American Fisheries Society** (August 2011-2012).
- **President – Western Division, American Fisheries Society.** 2008 - 2009. President of the largest division of the American Fisheries Society, encompassing all of the western United States, Canada and Mexico.
- **President Elect – Western Division, American Fisheries Society.** 2007- 2008.
- **Vice President – Western Division, American Fisheries Society.** 2006 - 2007.

- **Chair - Standard Sampling Committee – Fisheries Management Section, AFS.**  
Appointed to lead development of standard methods for sampling freshwater fisheries across the United States, Mexico and Canada. 2004 – Present.
- **Organizer – Sub Symposium – Standard Freshwater Fish Sampling Methods. – World Fisheries Congress, Edinburgh, Scotland, U.K. May, 2012.** Co-chaired this sub symposium as part of the inland fish symposium (International Meeting).
- **Co-Chair – Symposium - New Frontiers in the Management, Status, and Biology of Western Native Freshwater Fishes – AFS 2011 Annual Meeting, Seattle, WA.**  
Invited to co-chair a session on western native fishes at the annual AFS, Seattle, Washington Meeting (International Meeting).
- **Co-Chair – Symposium - Calibration, Validation and Other Recent Progress on the AFS Standard Methods for Sampling Freshwater Fish – AFS 2012 Annual Meeting, St. Paul, MN.** Invited to co-chair symposium on recent progress with the AFS Standard Sampling Methods (International Meeting).
- **Member - National Governing Board – AFS – 2007- 2009; 2011-Present.** Member of the international committee that governs the American Fisheries Society (Approx. 20 members).
- **Member - National Management Committee – AFS – 2007 – 2009.** Member of the international committee that manages the American Fisheries Society (Approx. 10 members).
- **Elected Member - Nominating Committee,** American Fisheries Society (September 2008 - September 2009).
- **Member - Scholarship Committee – Western Division, American Fisheries Society 2006-2009.**
- **Symposium Chair - Standard Sampling Symposium – AFS 2008 Annual Meeting, Ottawa, ON, Canada.** Chaired AFS standard fisheries sampling symposium (International Meeting) .
- **Co-Chair - Western Division AFS Annual Meeting - AFS 2008 Annual Meeting, Portland, OR** (International Meeting).
- **Program Committee Co-Chair - Western Division AFS 2008 Annual Meeting, Portland, OR** (International Meeting) . .
- **Member - American Fisheries Society - 1984 - Present**
- **Member - Western Division - American Fisheries Society**

- **Member - Arizona/New Mexico Chapter** - American Fisheries Society - 2000 - Present
- **Member - Introduced Fish Section** - American Fisheries Society – 2000- Present
- **Member - Fisheries Management Section** - American Fisheries Society – 2000 – Present
- **Member - Education Section** - American Fisheries Society – 2006 – Present
- **Student Paper Judge - AFS 2006 Annual Meeting, Lake Placid, NY** (International).
- **Student Subunit Advisor - AFS University of Arizona Subunit, 2004- Present.**
- **Chair - 2001 National Conference, Washington State Delegation.** Chosen by Washington Department of Fish and Wildlife administration to lead effort to attract the national conference to Washington State in 2001. The national AFS Conference is the largest fisheries conference in the United States. Collaborated with the East King County and the Seattle Convention Bureaus, the North Pacific International Chapter of the American Fisheries Society and WDFW staff to prepare a bid package for presentation at the 1998 AFS Annual Conference in Monterey, California.
- **Author - AFS Bull trout sampling protocol** - Elected by American Fisheries Society to co-author, with four other scientists, a survey protocol for bull trout populations in North America.
- **Member - National Publication Oversight Committee** – Serve as member and liaison to the Book Advisory Board.

#### **Desert Fishes Council**

- **Local Arrangements Chair - 2004 Annual Meeting, Tucson, AZ.** Elected to chair local arrangements for the 2004 Annual Conference of this U.S./Mexican Organization.

#### **North American Lake Management Society**

- **Session Co-Chair - Nutrient/Fish Trophic Dynamics.** International Symposium of the North American Lake Management Society, Seattle, Washington, November 30 - December 4, 1993. (International Meeting).

#### **North Pacific International Chapter of the American Fisheries Society**

- **Session Chair - Warmwater Fisheries: Current Research and Management.** 1994 Annual General Meeting, North Pacific International Chapter of the American Fisheries Society, February 10, 1994, Wenatchee, Washington (Regional Meeting).
- **Session Co-Chair - Bull Trout.** 1998 Annual General Meeting, North Pacific International Chapter of the American Fisheries Society, March 18-20, 1998, Union, Washington (Regional Meeting).

### **Pacific Fishery Biologists**

- **Program Chair - Pacific Fishery Biologist Annual Conference,** Silverdale, Washington, March 18-20, 1996 (Regional Meeting).
- **Session Chair - Contributed Papers.** Pacific Fishery Biologist Annual Conference, Silverdale, Washington, March 18-20, 1996 (Regional Meeting).

### ***Salvelinus confluentus* (Bull Trout) Curiosity Society**

- **Moderator - Bull Trout Presence and Absence Survey Methodologies.** *Salvelinus confluentus* Curiosity Society Annual Meeting. McKenzie Bridge, Oregon, October 15-17, 1996 (National Meeting).

### **Washington State Lakes Protection Association**

- **Elected to Board of Directors** 1994-1996.
- **Member of Editorial Committee** 1994 -1996.
- **Program Co-Chair - Washington State Lake Protection Ninth Annual Conference.** Ocean Shores, Washington, September 8-9, 1995 (Regional Meeting).
- **Session Chair. Fish and Fish Habitat - Washington State Lakes Protection Association Tenth Annual Conference.** Spokane, Washington, September 26-28, 1996 (Regional Meeting).
- **Session Chair - Managing Lakes for Quality Fish Populations. Washington State Lake Protection Ninth Annual Conference.** Ocean Shores, Washington, September 8-9, 1995 (Regional Meeting).

### **Other**

- **Program Co-Chair - Washington Department of Fish and Wildlife Bass Management Meeting.** Olympia, Washington, July 9-10, 1996 (Regional Meeting).

- **Session Co-Chair - Wetland Restoration.** Washington Cooperative Fish and Wildlife Research Unit Annual Cooperator's Meeting. Seattle, Washington, April 22, 1998 (Regional Meeting).

Past member of the following organizations: Northwest Scientific Association, Aquatic Plant Management Society, Washington State Lakes Protection Association, Pacific Fishery Biologists, North Pacific International American Fisheries Society Chapter, *Salvelinus confluentus* (Bull Trout) Curiosity Society.

## **b. TECHNICAL PRESENTATIONS**

### **Keynote or Special Presentations**

**Bonar, S.A. 2012. (Keynote/Plenary Address). The Conservation Professional's Guide to Working with People.** Keynote Address to the 45th Annual Meeting of the Montana Chapter of the American Fisheries Society, Helena, Montana, February 6-10, 2012. INVITED.

**Bonar, S.A. 2011. Standard methods for sampling North American freshwater fishes. An overview for European Fisheries Standards Committee (CEN).** British Standards Institute, London, United Kingdom, March 16, 2011. INVITED.

**Bonar, S.A. 2010. (Keynote/Plenary Address). Case Histories of standard sampling in North America.** Keynote Address to Conference, Fish Sampling with Active Methods. September 8-11, 2010. Ceske Budejovice, Czech Republic. INVITED.

**Bonar, S.A. 2010. (Keynote/Plenary Address). An evolving profession: how fisheries management has changed in the far west.** Plenary Address to the Texas Chapter of the American Fisheries Society. January 21-23, 2010, Athens, Texas. INVITED.

**Bonar, S.A. 2007. (Keynote/Plenary Address – Student Breakfast) The conservation professional's guide to working with people.** The Wildlife Society 14<sup>th</sup> Annual Conference, Tucson, Arizona. September 22-26, 2007. INVITED.

**Bonar, S.A. 2007. (Keynote/Plenary Address) Standard sampling methods for North American inland fish: A multi-agency project coordinated by the American Fisheries Society.** Fish Stock Assessment Methods for Lakes and Reservoirs: Towards the True Picture of the Fish Stock. Ceske Budejovice, Czech Republic, September 11-15, 2007. INVITED.

**Bonar, S.A. 2007. (Keynote/Plenary Address). The conservation professional's guide to working with people.** Keynote Address to the Urban Wildlife Management National Conference, Arbor Day Foundation, June 18-20, 2007. INVITED.

**Bonar S.A. and Y. Kuzmenko. 2006. Managing inland populations of large, piscivorous fish, from important commercial fisheries to invasive, economically harmful species.** Address to the NATO (North Atlantic Treaty Organization) Environmental Security Council, NATO Headquarters, Brussels, Belgium, September 28, 2006. INVITED.

**Bonar, S.A. 2006. (Keynote/Plenary Address) Nonnative aquatic species in the American West: Their weird history, current research and thoughts for the future.** Arizona-New Mexico Chapter of the American Fisheries Society/The Wildlife Society, Flagstaff, Arizona, February 2-4, 2006. INVITED.

### **Meeting Presentations**

**Bonar, S. A. 2013. New options for managing native trout habitat with climate change implications.** 4th Annual Native Trout Conference, Phoenix, Arizona, April 18, 2013. INVITED.

**Bonar, S.A. 2013. <http://fisheriesstandardsampling.org> :A simple web-based tool to analyze standard fish data with a click of a button.** 46th Joint Annual Meeting of the Arizona/New Mexico Chapters of The Wildlife Society and American Fisheries Society. Albuquerque, New Mexico, February 7-9, 2013. CONTRIBUTED.

**Clark, S.L. and S.A. Bonar. 2013. Relationship between U.S.-Mexico border operations and suspended sediment in headwaters of the Rio Yaqui.** 46th Joint Annual Meeting of the Arizona/New Mexico Chapters of The Wildlife Society and American Fisheries Society. Albuquerque, New Mexico, February 7-9, 2013. CONTRIBUTED.

**Mercado-Silva, N., S.A. Bonar, M. Rahr, T. Torey, and A. Cate Jr. 2013. Comparing standard North American freshwater fish data using a simple online tool: [fisheriesstandardsampling.org](http://fisheriesstandardsampling.org).** Annual Meeting of the Southern Division of the American Fisheries Society. Nashville, Tennessee, February 7-10, 2013. CONTRIBUTED.

**Mercado-Silva, N., S.A. Bonar, M. Rahr, T. Torey, and A. Cate Jr. 2013. Comparing standard North American freshwater fish data using a simple online tool: [fisheriesstandardsampling.org](http://fisheriesstandardsampling.org).** 93<sup>rd</sup> Joint Meeting of Ichthyology and Herpetology, Albuquerque, New Mexico, July 10-15 2013. CONTRIBUTED.



- Petre, S., S.A. Bonar, Mercado-Silva, N., M. Rahr, T. Torey, and A. Cate Jr. 2013. Comparing standard North American freshwater fish data using a simple online tool: fisheriesstandardsampling.org.** Annual Meeting of the Western Division of the American Fisheries Society. Boise, Idaho, April 15-18, 2013. CONTRIBUTED.
- Petre, S. and S.A. Bonar. 2013. Using habitat suitability criteria as a tool to understand distribution dilemmas for Apache Trout, a rare Southwestern salmonid impacted by non-native crayfish.** Annual Meeting of the Western Division of the American Fisheries Society. Boise, Idaho, April 15-18, 2013. CONTRIBUTED.
- Price, J.E. and S.A. Bonar. 2013. Potential methods to cool streams containing Apache trout in the White Mountains of Arizona with implication for climate change.** 46th Joint Annual Meeting of the Arizona/New Mexico Chapters of The Wildlife Society and American Fisheries Society. Albuquerque, New Mexico, February 7-9, 2013. CONTRIBUTED.
- Petre, S. and S.A. Bonar. 2013. A comparison of habitat suitability criteria for Apache trout and the non-native virile crayfish.** 46th Joint Annual Meeting of the Arizona/New Mexico Chapters of The Wildlife Society and American Fisheries Society. Albuquerque, New Mexico, February 7-9, 2013. CONTRIBUTED.
- Ruggirello, J.E., S.A. Bonar, and O.G. Feuerbacher. 2013. Spawning ecology of the critically endangered Moapa Dace, *Moapa coriacea*, revealed through underwater videography.** 46th Joint Annual Meeting of the Arizona/New Mexico Chapters of The Wildlife Society and American Fisheries Society. Albuquerque, New Mexico, February 7-9, 2013. CONTRIBUTED.
- Bonar, S.A. 2012. Why restore and protect desert fishes? Lessons from history, economics and biology.** 44th Annual Meeting of the Desert Fishes Council. Death Valley National Park, California, November 14-18, 2012. INVITED.
- Clark, S.L. and S.A. Bonar. 2012. Relationship between U.S.-Mexico border operations and total suspended sediment in headwaters of the Rio Yaqui.** 44th Annual Meeting of the Desert Fishes Council. Death Valley National Park, California, November 14-18, 2012. CONTRIBUTED.
- Chaudoin, A.L., O.G. Feuerbacher, S.A. Bonar, and P. J. Barrett. 2012. Using video to investigate relationships between environmental conditions and spawning behavior in Devils Hole pupfish.** 44th Annual Meeting of the Desert Fishes Council. Death Valley National Park, California, November 14-18, 2012. CONTRIBUTED.

- Feuerbacher, O.G., S.A. Bonar, and P. Barrett. 2012. Detection, disease characteristics, and control of non-tuberculosis mycobacteria in hybrid Devils Hole pupfish.** 44th Annual Meeting of the Desert Fishes Council. Death Valley National Park, California, November 14-18, 2012. CONTRIBUTED.
- Petre, S. and S.A. Bonar. 2012. A comparison of habitat suitability criteria for Apache trout and the non-native virile crayfish.** 44th Annual Meeting of the Desert Fishes Council. Death Valley National Park, California, November 14-18, 2012. CONTRIBUTED.
- Price, J. and S.A. Bonar. 2012. Can streams containing Apache Trout be cooled? Relationships between environmental variables and stream temperature with management implications under climate change.** 44th Annual Meeting of the Desert Fishes Council. Death Valley National Park, California, November 14-18, 2012. CONTRIBUTED.
- Ruggirello, J.E., S.A. Bonar, and O.G. Feuerbacher. 2012. Spawning ecology of the critically endangered Moapa dace, *Moapa coriacea*, revealed through underwater videography.** 44th Annual Meeting of the Desert Fishes Council. Death Valley National Park, California, November 14-18, 2012. CONTRIBUTED.
- Bonar, S.A. 2012. Recent Advances and an Overview of North American AFS Freshwater Fish Sampling Standardization.** 142nd Annual Meeting of the American Fisheries Society, Minneapolis-St. Paul, Minnesota, August 19-23, 2012. INVITED.
- Bonar, S.A., M. Rahr, T. Torrey, A. Cate Jr., and N. Mercado Silva, 2012. Comparing Standard North American Freshwater Fish Data Using a Web-Accessible Database.** 142nd Annual Meeting of the American Fisheries Society, Minneapolis-St. Paul, Minnesota, August 19-23, 2012. INVITED.
- Chaudoin, A.L., O.G. Feuerbacher, S.A. Bonar, and P.J. Barrett. 2012. Using Video to Investigate Relationships Between Environmental Conditions and Spawning Behavior in Devils Hole Pupfish.** 142nd Annual Meeting of the American Fisheries Society, Minneapolis-St. Paul, Minnesota, August 19-23, 2012. CONTRIBUTED.
- Feuerbacher, O.G., S.A. Bonar, and P.J. Barrett. 2012. Detection, Disease Characteristics, and Control of Non-Tuberculosis Mycobacteria in Hybrid Devils Hole Pupfish.** 142nd Annual Meeting of the American Fisheries Society, Minneapolis-St. Paul, Minnesota, August 19-23, 2012. CONTRIBUTED.

- Mercado-Silva, N. and S.A. Bonar 2012. Standardized methods for sampling inland fishes in Mexico: Development, utilization and validation.** 142nd Annual Meeting of the American Fisheries Society, Minneapolis-St. Paul, Minnesota, August 19-23, 2012. INVITED.
- Bonar, S.A. 2012. Recent advances and an overview of North American freshwater fish sampling standardization.** 6th World Fisheries Congress, Edinburgh, Scotland, May 7-11, 2012. CONTRIBUTED.
- Chaudoin, A.L., O.G. Feuerbacher, S.A. Bonar, and P.J. Barrett. 2012. Using remote systems to assess relationships between environmental conditions and reproductive behavior in Devils Hole pupfish .** 45th Joint Annual Meeting of the Arizona/New Mexico Chapters of The Wildlife Society and American Fisheries Society. Phoenix, Arizona, February 2-4, 2012. CONTRIBUTED-BEST STUDENT PAPER AWARD.
- Mercado-Silva, N. and S.A. Bonar. 2012. Habitat requirements for two catostomids in an Arizona stream.** 45th Joint annual meeting of the Arizona and New Mexico chapters of the American Fisheries Society. Phoenix, Arizona, February 2-4, 2012. CONTRIBUTED.
- Bonar, S.A. 2011. Advances in fish sampling: An overview of techniques and standardization.** 141st Annual Meeting of the American Fisheries Society, September 4-8, 2011. CONTRIBUTED.
- Chaudoin, A.L., O.G. Feuerbacher, S.A. Bonar, and P.J. Barrett. 2011. Environmental factors and spawning behavior in the Devils Hole pupfish.** 141st Annual Meeting of the American Fisheries Society. Seattle, Washington, September 4-8, 2011. INVITED.
- Feuerbacher, O.G., S.A. Bonar, A.L. Chaudoin, and P.J. Barrett. 2011. Construction of a mesocosm recreation of Devils Hole.** 141st Annual Meeting of the American Fisheries Society. Seattle, WA, Sept 4-8, 2011. CONTRIBUTED.
- Mapula, J., O.G. Feuerbacher, S.A. Bonar, K. Wilson, and P.J. Barrett. 2011. Food Bottlenecks to Larval Recruitment of Devils Hole Pupfish.** 141st Annual Meeting of the American Fisheries Society. Seattle, Washington, September 4-8, 2011. INVITED.
- Recsetar, M.S., S.A. Bonar, O.G. Feuerbacher, and C.A. Caldwell. 2011. Assessing the thermal tolerance of Apache trout at critical life stages.** 141st Annual Meeting of the American Fisheries Society. Seattle, Washington, September 4-8, 2011. INVITED.

- Bonar, S.A. 2011. Aquatic research at the Arizona Cooperative Fish and Wildlife Research Unit.** U.S. Fish and Wildlife Service Devils Hole Pupfish Biologists' Meeting, Las Vegas, Nevada, June 23-24, 2011. INVITED.
- Chaudoin, A.L., O.G. Feuerbacher, S.A. Bonar, and P.J. Barrett. 2011. Using stand-alone video to monitor reproductive behavior in Devils Hole pupfish.** U.S. Fish and Wildlife Service Devils Hole Pupfish Biologists' Meeting, Las Vegas, Nevada, June 23-24, 2011. INVITED.
- Feuerbacher, O.G., S.A. Bonar, and A.L. Chaudoin. 2011. Construction of a mesocosm recreation of Devils Hole.** U.S. Fish and Wildlife Service Devils Hole Pupfish Biologists' Meeting, Las Vegas, Nevada, June 23-24, 2011. INVITED.
- Feuerbacher, O.G., S.A. Bonar, and P.J. Barrett. 2011. Applications of surface disinfectants and antibiotics to hybrid Devils Hole pupfish eggs.** U.S. Fish and Wildlife Service Devils Hole Pupfish Biologists' Meeting, Las Vegas, Nevada, June 23-24, 2011. INVITED.
- Mapula, J., O.G. Feuerbacher, S.A. Bonar, K. Wilson, and P.J. Barrett. 2011. Food bottlenecks to larval recruitment of Devils Hole pupfish.** U.S. Fish and Wildlife Service Devils Hole Pupfish Biologists' Meeting, Las Vegas, Nevada, June 23-24, 2011. INVITED.
- Chaudoin, A.L., O.G. Feuerbacher, S.A. Bonar, and P.J. Barrett. 2011. Using stand-alone video to monitor reproductive behavior in Devils Hole pupfish.** 2011 Devils Hole Workshop, Pahrump, Nevada, May 4-6, 2011. INVITED.
- Feuerbacher, O.G., S.A. Bonar, and A.L. Chaudoin. 2011. Construction of a mesocosm recreation of Devils Hole.** 2011 Devils Hole Workshop, Pahrump, Nevada, May 4-6, 2011. INVITED.
- Mapula, J., O.G. Feuerbacher, S.A. Bonar, K. Wilson, and P.J. Barrett. 2011. Food bottlenecks to larval recruitment of Devils Hole pupfish.** 2011 Devils Hole Workshop, Pahrump, Nevada, May 4-6, 2011. INVITED.
- Bonar, S.A. 2011. Advances in fish sampling: An overview of techniques and standardization.** The Arizona/New Mexico Chapters of the American Fisheries Society and The Wildlife Society, Joint Annual Meeting, Pinetop, Arizona, February 3-5, 2011. CONTRIBUTED.
- Chaudoin, A.L., O.G. Feuerbacher, S.A. Bonar, and P.J. Barrett. 2011. Using stand-alone video to monitor reproductive behavior in Devils Hole pupfish.** The Arizona/New Mexico Chapters of the American Fisheries Society and The Wildlife Society Joint Annual Meeting, Pinetop, Arizona, February 3-5, 2011. CONTRIBUTED.

- Feuerbacher, O.G., S.A. Bonar, and A.L. Chaudoin. 2011. Construction of a mesocosm recreation of Devils Hole.** The Arizona/New Mexico Chapters of the American Fisheries Society and The Wildlife Society Joint Annual Meeting, Pinetop, Arizona, February 3-5, 2011. CONTRIBUTED.
- Mapula, J., O.G. Feuerbacher, and S.A. Bonar. 2011. Food bottlenecks to larval recruitment of the Devils Hole pupfish.** The Arizona/New Mexico Chapters of the American Fisheries Society and The Wildlife Society Joint Annual Meeting, Pinetop, Arizona, February 3-5, 2011. CONTRIBUTED.
- Mercado-Silva, N. and S.A. Bonar. 2011. Larval fish habitat preference and distribution in an unregulated Arizona desert stream.** The Arizona/New Mexico Chapters of the American Fisheries Society and The Wildlife Society Joint Annual Meeting, Pinetop, Arizona, February 3-5, 2011. CONTRIBUTED.
- Price, J.E. and S.A. Bonar. 2011. Habitat variables associated with stream temperature resiliency in the White Mountains of Arizona with implications for Apache trout distribution in response to climate change.** The Arizona/New Mexico Chapters of the American Fisheries Society and The Wildlife Society Joint Annual Meeting, Pinetop, Arizona, February 3-5, 2011. CONTRIBUTED – BEST STUDENT PAPER AWARD.
- Bonar, S.A. 2010. Advances in fish sampling: An overview of techniques and standardization.** 42nd Annual Meeting of the Desert Fishes Council, Moab, Utah, November 17-21, 2010. CONTRIBUTED.
- Chaudoin, A.L., O.G. Feuerbacher, S.A. Bonar, and P.J. Barrett. 2010. Using stand-alone video to monitor reproductive behavior in Devils Hole pupfish.** 42nd Annual Meeting of the Desert Fishes Council, Moab, Utah, November 17-21, 2010. CONTRIBUTED.
- Mercado-Silva, N. and S.A. Bonar. 2010. Metodos estandarizados para el muestreo de peces dulceacuicolas en Norteamerica.** 2010 Meeting of the Sociedad Ictiologica Mexicana, Nuevo Vallarta, Nayarit, Mexico. CONTRIBUTED.
- Chaudoin, A.L., O.G. Feuerbacher, S.A. Bonar, and P.J. Barrett. 2010. Using remote systems to assess relationships between environmental conditions and reproductive behavior in Devils Hole pupfish.** 43rd Joint Annual Meeting of the Arizona/New Mexico Chapter of the American Fisheries Society. February 4-6, 2010, Flagstaff, Arizona. CONTRIBUTED.
- Feuerbacher, O.G., S.A. Bonar, and P.J. Barrett. 2010. Control of pathogens in laboratory-reared hybrid Devils Hole pupfish.** 43rd Joint Annual Meeting of the Arizona/New Mexico Chapter of the American Fisheries Society. February 4-6, 2010, Flagstaff, Arizona. CONTRIBUTED.

- Mapula, J., O.G. Feuerbacher, S.A. Bonar, K. Wilson, and P.J. Barrett. 2010. Food Bottlenecks to Larval Recruitment of Devils Hole Pupfish.** 43rd Joint Annual Meeting of the Arizona/New Mexico Chapter of the American Fisheries Society. February 4-6, 2010, Flagstaff, Arizona. CONTRIBUTED.
- Recsetar, M., M. Zeigler, D. Ward, S.A. Bonar, and C. Caldwell. 2010. Testing the Thermal Tolerance of Various Life Stages of Fish Using the Critical Thermal Method.** 43rd Joint Annual Meeting of the Arizona/New Mexico Chapter of the American Fisheries Society. February 4-6, 2010, Flagstaff, Arizona. CONTRIBUTED.
- Chaudoin, A.L., O.G. Feuerbacher, S.A. Bonar, and P.J. Barrett. 2009. Using stand-alone videography and water quality sensing to assess relationships between environmental conditions and reproductive behavior in Devils Hole pupfish.** 41st Annual Meeting of the Desert Fishes Council. Death Valley, California, November 19-22, 2009. CONTRIBUTED.
- Feuerbacher, O.G., S.A. Bonar, and P.J. Barrett. 2009. Application of prophylactic disease treatments in laboratory rearing of hybrid Devils Hole pupfish.** 41st Annual Meeting of the Desert Fishes Council. Death Valley, California, November 19-22, 2009. INVITED.
- Mapula, J., O.G. Feuerbacher, S.A. Bonar, and K. Wilson. 2009. Laboratory replication of Devils Hole algal and zooplankton communities.** 41st Annual Meeting of the Desert Fishes Council. Death Valley, California, November 19-22, 2009. INVITED.
- Recsetar, M., M. Zeigler, S.A. Bonar, D. Ward, and C. Caldwell. 2009. Testing the thermal tolerance of various life stages of fish using the critical thermal method.** 41st Annual Meeting of the Desert Fishes Council. November 19-22, 2009. CONTRIBUTED.
- Bonar, S.A., M. Brouder, and A. Iles. 2009. Aggregating disparate fish data sets: challenges, techniques and a bit of social psychology.** 139th Annual Meeting of the American Fisheries Society, Nashville, Tennessee. August 30 - September 3, 2009. INVITED.
- Bonar, S.A., W. Hubert, and D. Willis. 2009. Standard methods for sampling North American freshwater fishes.** Annual Meeting of the Western Division of the American Fisheries Society. Albuquerque, New Mexico, May 3-7, 2009. CONTRIBUTED.

- Bonar, S.A., T.P. Archdeacon, A. Iles, S.J. Kline, A. A. Schultz, and E. Sontz. 2009.** **An overview of captive breeding methods for five imperiled desert chub and topminnow species.** Annual Meeting of the Western Division of the American Fisheries Society. Albuquerque, New Mexico, May 3-7, 2009. CONTRIBUTED.
- Chaudoin, A.L., O.G. Feuerbacher, S.A. Bonar, and P.J. Barrett. 2009.** **Using stand-alone videography and water quality sensing to assess relationships between environmental conditions and reproductive behavior in Devils Hole Pupfish.** Annual Meeting of the Western Division of the American Fisheries Society. Albuquerque, New Mexico. May 3-7, 2009. CONTRIBUTED.
- Feuerbacher, O.G., S.A. Bonar, and P. Barrett. 2009.** **Application of prophylactic disease treatments in laboratory rearing of hybrid Devils Hole pupfish.** Annual Meeting of the Western Division of the American Fisheries Society. Albuquerque, New Mexico. May 3-7, 2009. CONTRIBUTED.
- Kretschmann, A., S.A. Bonar, K. Young, J. Whittier, C. Paukert, and D. Guertin. 2009.** **Using Geographic Information Systems to delineate native fish and sport fish management areas in the Verde River watershed, Arizona.** Annual Meeting of the Western Division of the American Fisheries Society. Albuquerque, New Mexico, May 3-7, 2009. INVITED.
- Recsetar, M., M. Zeigler, D. Ward, S.A. Bonar, and C. Caldwell. Testing the Thermal Tolerance of Various Life Stages of Fish Using the Critical Thermal Method.** Annual Meeting of the Western Division of the American Fisheries Society. Albuquerque, New Mexico. May 3-7, 2009. CONTRIBUTED.
- Rogowski, D., S. Sitko, and S.A. Bonar. 2009.** **Optimizing northern crayfish (*Orconectes virilis*) control methods in Arizona streams.** Annual Meeting of the Western Division of the American Fisheries Society. Albuquerque, New Mexico. May 3-7, 2009. CONTRIBUTED.
- Bonar, S.A., T.P., Archdeacon, A. Iles, S.J. Kline, A.A. Schultz, and E. Sontz. 2008.** **An overview of captive breeding methods for five imperiled desert chub and topminnow species** 40th Annual Meeting of the Desert Fishes Council, Cuatro Ciénegas, Mexico, November 12-16, 2008. CONTRIBUTED.
- Bonar, S.A., O. Feuerbacher, A. Chaudoin, and J. Mapula. 2008.** **Proposed propagation research for Devils Hole pupfish.** Devils Hole Pupfish Research Meeting, Las Vegas, Nevada, October, 2008. INVITED.
- Bonar, S.A., W.A. Hubert, and D.W. Willis. 2008.** **Standard methods for sampling North American freshwater fishes.** 138th Annual Meeting of the American Fisheries Society, Ottawa, Ontario August 17-21, 2008. Introductory presentation of Standard methods for sampling North American Freshwater Fishes symposium. INVITED.

- Bonar, S.A., W.A. Hubert, and D.W. Willis. 2008. Standard methods for sampling North American freshwater fishes.** Western Division of the American Fisheries Society, Portland, Oregon. May 5-7, 2008. CONTRIBUTED.
- Kretschmann, A., S. A. Bonar, and K. Young. 2007. Using geographic information systems as a tool to delineate native fish and sport fish management areas for use in a fisheries management plan of the Verde River watershed, Arizona.** Desert Fishes Council Meeting, Ventura CA, December, 2007. CONTRIBUTED.
- Kuzmenko, Y., S.A. Bonar, and T. Spesivy. 2007. Can we mechanically control nuisance populations of northern pike in Southwestern lakes?** Desert Fishes Council Annual Meeting, Ventura CA, December, 2007. CONTRIBUTED.
- Sontz, E. and S.A. Bonar 2007. Propagation and rearing of headwaters chub.** Desert Fishes Council, Ventura CA, December 2007. CONTRIBUTED.
- Bonar, S.A. 2007. How to persuade people – Lessons from psychology and marketing for the wildlife biologist.** The Wildlife Society 14<sup>th</sup> Annual Conference, Tucson, Arizona. September 22-26, 2007. CONTRIBUTED.
- Bonar, S.A. 2007. How to persuade people – Lessons from psychology and marketing for the fisheries biologist.** American Fisheries Society 137<sup>th</sup> Annual Meeting, San Francisco, California. September 2-6, 2007. CONTRIBUTED.
- Bonar, S.A., W.A. Hubert, and D.W. Willis. 2007. Standard methods to sample inland fishes of North America. Progress report. Fisheries Management Section,** American Fisheries Society 137<sup>th</sup> Annual Meeting, San Francisco, California. September 2-6, 2007. INVITED.
- Bonar, S.A., W.A. Hubert, and D.W. Willis. 2007. Standard methods to sample inland fishes of North America. Progress report.** Education Section, American Fisheries Society 137<sup>th</sup> Annual Meeting, San Francisco, California. September 2-6, 2007. INVITED.
- Bonar, S.A. 2007. Fishes in the Desert. Aquatic research at the Arizona Cooperative Fish and Wildlife Research Unit.** Guest Speaker at the Washington Cooperative Fish and Wildlife Research Unit Annual Cooperator's Meeting. May 15, 2007. INVITED.
- Archdeacon, T.P. and S.A. Bonar. 2007. Effects of Asian fish tapeworm and western mosquitofish on Mohave tui chub growth and survival.** Mohave National Preserve Meeting, Palm Desert, California, May 10, 2007. INVITED.



- DuBey, R., S. Schrader, C. Caldwell, D. L. Winkleman, P. Budy, and S. Bonar. 2007. Southwest regional risk assessment for whirling disease in native salmonids: Data assembly and conceptual model development.** 13<sup>th</sup> Annual Whirling Disease Symposium “Resistance on Two Fronts”. Denver, Colorado, February 12-13, 2007. CONTRIBUTED.
- Bonar, S. A., W.A. Hubert, and D.W. Willis. 2008. Standard methods for sampling North American freshwater fishes.** Arizona/New Mexico Chapter of the American Fisheries Society Annual Meeting, Prescott, Arizona. February 7-9, 2007. CONTRIBUTED.
- Kretschmann, A. and S.A. Bonar. 2008. Using geographic information systems to delineate native fish and sport fish management areas in the Verde River Watershed, Arizona.** Arizona/New Mexico Chapter of the American Fisheries Society Annual Meeting, Prescott, Arizona. February 7-9, 2007. CONTRIBUTED.
- Kuzmenko, Y., S.A. Bonar, and T. Specivy. 2008. Efficiency of mechanical control of nuisance populations of northern pike in small Arizona lakes.** Arizona/New Mexico Chapter of the American Fisheries Society Annual Meeting, Prescott, Arizona. February 7-9, 2007. CONTRIBUTED.
- Rogowski, D. and S.A. Bonar. 2008. Optimizing control methods for an invasive crayfish.** Arizona/New Mexico Chapter of the American Fisheries Society Annual Meeting, Prescott, Arizona. February 7-9, 2007. CONTRIBUTED.
- Sontz, E. and S.A. Bonar. 2008. Captive breeding of headwaters chub, an imperiled Southwestern cyprinid.** Arizona/New Mexico Chapter of the American Fisheries Society Annual Meeting, Prescott, Arizona. February 7-9, 2007. CONTRIBUTED.
- Archdeacon, T.P. and S.A. Bonar. 2007. Effects of Asian fish tapeworm and western mosquitofish on Mohave tui chub growth and survival.** Arizona/New Mexico Chapter of the American Fisheries Society Annual Meeting, Albuquerque, New Mexico February 6-8, 2007. CONTRIBUTED.
- Kretschmann, A., S.A. Bonar, and K. Young. 2007. Using geographic information systems as a tool to delineate native fish and sport fish management areas for use in a fisheries management plan of the Verde River watershed, Arizona.** Arizona/New Mexico Chapter of the American Fisheries Society Annual Meeting, Albuquerque, New Mexico. February 6-8, 2007. CONTRIBUTED – BEST STUDENT POSTER.

- Kuzmenko, Y., S.A. Bonar, and T. Spesivy. 2007. Can we mechanically control nuisance populations of northern pike in Southwestern lakes? Lessons from the Ukraine.** Arizona/New Mexico Chapter of the American Fisheries Society Annual Meeting, Albuquerque, New Mexico. February 6-8, 2007. CONTRIBUTED.
- Schultz, A.A. and S.A. Bonar, 2007. Selected aspects of the natural history of Gila chub.** Arizona/New Mexico Chapter of the American Fisheries Society Annual Meeting, Albuquerque, New Mexico February 6-8 2007. CONTRIBUTED.
- Kline, S.J. and S.A. Bonar. 2006. Effect of Asian tapeworm on the growth and mortality of Yaqui chub and Yaqui topminnow.** 38th Annual Meeting of the Desert Fishes Council, Death Valley, California, November 15-19, 2006. CONTRIBUTED – BEST STUDENT PAPER AWARD.
- Iles, A.C., S.A. Bonar, W.A. Hubert, and D.W. Willis. 2006. Standard Sampling Methods for North American Freshwater Fishes: an example of a data standards initiative.** National Fisheries Data Summit - Focusing on Applications to the National Fish Habitat Initiative, Salt Lake City, Utah, October 31-November 2, 2006. INVITED.
- Archdeacon, T.P. and S.A. Bonar. 2006. Laboratory spawning of Mojave tui chub.** 136th American Fisheries Society Annual Meeting, Lake Placid, New York, September 10-14, 2006. CONTRIBUTED.
- Kline, S.J. and S.A. Bonar. 2006. Effects of Asian tapeworm on the growth and mortality of Yaqui chub and Yaqui topminnow.** 136th American Fisheries Society Annual Meeting, Lake Placid, New York, September 10-14, 2006. CONTRIBUTED.
- Schultz, A. and S.A. Bonar. 2006. Spawning and culture of Gila chub.** 136th American Fisheries Society Annual Meeting, Lake Placid, New York, September 10-14, 2006. CONTRIBUTED.
- Kline, S.J. and S.A. Bonar. 2006. Effect of Asian tapeworm on the growth and mortality of Yaqui chub and Yaqui topminnow.** AZ/NV Academy of Science, Tucson, Arizona, April 8, 2006. INVITED – BEST STUDENT PAPER AWARD.
- Bonar, S.A., W. Hubert, D. Willis, M. Brouder, and A. Iles. 2005. Standard sampling methods for North American freshwater fishes: Averages and standards for commonly used fisheries indices.** Desert Fishes Council. Cuatro Ciénegas, Coahuila, Mexico, November 16-20, 2005. CONTRIBUTED.

- Kline, J.S., S.A. Bonar, and A. Francis. 2005. Propagation of Yaqui chub (*Gila purpurea*), and Yaqui topminnow (*Poeciliopsis occidentalis sonoriensis*) in a controlled environment.** Presented to the Desert Fishes Council. Cuatro Cienegas, Coahuila, Mexico, November 16-20, 2005. CONTRIBUTED (Poster).
- Schade, C.B. and S.A. Bonar. 2005. Distribution and abundance on non-native fishes in streams of the American West.** Presented to the Desert Fishes Council. Cuatro Cienegas, Coahuila, Mexico, November 16-20 2005. CONTRIBUTED.
- Sponholtz, P., J. Voeltz, D. Mitchell, J. Simms, C. Carter, D. Propst, and S.A. Bonar. 2005. Lower Colorado River Area Report,** November 2004-2005. Presented to the Desert Fishes Council. Cuatro Cienegas, Coahuila, Mexico, November 16-20, 2005. INVITED.
- Archdeacon, T.P. and S.A. Bonar. 2006. Techniques for laboratory spawning of Mohave tui chub.** 38th Annual Meeting of the Desert Fishes Council, Death Valley, California, November 15-19 2005. CONTRIBUTED.
- Bonar, S.A. 2005. An update of the new book, Standardized Sampling of North American Freshwater Fishes.** Presented to the Fisheries Management Section of the 135th Annual Meeting of the American Fisheries Society, Anchorage, Alaska, September 11-15, 2005. INVITED.
- Bonar, S.A. 2005. An update of the new book, Standardized Sampling of North American Freshwater Fishes.** Presented to the Education Section of the 135th Annual Meeting of the American Fisheries Society, Anchorage, Alaska, September 11-15, 2005. INVITED.
- Bonar, S.A., D.W. Willis, and W.A. Hubert. 2005. Standard Sampling Methods for North American Freshwater Fishes.** 135th Annual Meeting of the American Fisheries Society, Anchorage, Alaska, September 11-15, 2005. CONTRIBUTED.
- Archdeacon, T.P. and S.A. Bonar. 2006. Propagation of Mohave tui chub.** Presented to the Arizona-New Mexico Chapter of the American Fisheries Society, Flagstaff, Arizona February 2-4, 2005. CONTRIBUTED (Poster).
- Bonar, S.A., A. Iles, D.W. Willis, and W.A. Hubert 2006. Standard Sampling Methods for North American Freshwater Fishes.** Presented to the Arizona-New Mexico Chapter of the American Fisheries Society, Flagstaff, Arizona. February 2-4, 2005. CONTRIBUTED.
- Kline, J., S.A. Bonar, and A. Choudhury. 2006. Effects of Asian tapeworm on fishes of the Rio Yaqui basin.** Presented to the Arizona-New Mexico Chapter of the American Fisheries Society, Flagstaff, Arizona, February 2-4, 2005. CONTRIBUTED.

- Bonar, S.A. 2004. Can people be influenced to improve their conservation ethic towards desert fishes? Lessons from psychology and marketing.** Desert Fishes Council Annual Meeting. Tucson, Arizona, November 10-14, 2004. CONTRIBUTED.
- Carveth, C.J., A.W. Widmer, and S.A. Bonar. 2004. Upper lethal tolerance of Arizona's native fishes.** Desert Fishes Council Annual Meeting. Tucson, Arizona, November 10-14, 2004. CONTRIBUTED.
- Schultz, A.A. and S.A. Bonar. 2004. Determining effective culture temperatures for larval and juvenile Gila chub (*Gila intermedia*).** Desert Fishes Council Meeting. Tucson, Arizona, November 10-14, 2004. CONTRIBUTED.
- Widmer, A.M., C. J. Carveth, S.A. Bonar, and J.R. Simms. 2004. Upper thermal tolerance of loach minnow (*Tiaroga cobitis*)** Desert Fishes Council Meeting. Tucson, Arizona, November 10-14, 2004. CONTRIBUTED.
- Bonar, S.A., B. Bolding, M. Divens, and W. Meyer. 2003. Effects of introduced fishes on coho salmon in small Pacific Northwest lakes and implications for management.** Seminar, Washington Department of Fish and Wildlife, Olympia, Washington. September 15<sup>th</sup>, 2003. CONTRIBUTED.
- Bonar, S.A. 2004. A description of the new book, Standardized Sampling of North American Freshwater Fishes.** Presented to the Fisheries Management Section of the 134th Annual Meeting of the American Fisheries Society, Madison, Wisconsin, August 23-26, 2004. CONTRIBUTED.
- Bonar, S.A. 2004. A description of the new book, Standardized Sampling of North American Freshwater Fishes.** Presented to the Education Section of the 134th Annual Meeting of the American Fisheries Society, Madison, Wisconsin, August 23-26, 2004. CONTRIBUTED.
- Carveth, C. J., A. Widmer, and S.A. Bonar. 2004. Critical thermal maxima of Arizona's native and nonnative fish species: have Arizona's native fish finally reached their boiling point?** Presented to the 134th Annual Meeting of the American Fisheries Society, Madison, Wisconsin, August 23-26, 2004. CONTRIBUTED.
- Widmer, A., C.J. Carveth, and S.A. Bonar. 2004. A comparison of methods for measuring thermal tolerance: loach minnow and spinedace as examples.** Presented to the 134th Annual Meeting of the American Fisheries Society, Madison, Wisconsin, August 23-26, 2004. CONTRIBUTED.

- Leslie, L.L., C.E. Velez, and S.A. Bonar. 2003. Diet and consumption rates of introduced fishes in the Verde River, Arizona.** Arizona Game and Fish Department, Statewide Research Meeting, Phoenix Arizona, December 17, 2003. INVITED.
- Leslie, L.L., C.E. Velez, and S.A. Bonar. 2003. Diet and consumption rates of introduced fishes in the Verde River, Arizona.** Desert Fishes Council, Annual Meeting, Death Valley, California, November 20-23, 2003. CONTRIBUTED.
- Schultz, A.A., O.E. Maughan, S.A. Bonar, and W. Matter. 2003. Effect of a reservoir on downstream abundance of native and nonnative fishes in a small desert stream.** Desert Fishes Council, Annual Meeting, Death Valley, California, November 20-23, 2003, Poster Presentation. CONTRIBUTED.
- Schade, C.S. and S.A. Bonar. 2003. Patterns in the distribution and relative abundance of exotic fish species in the American West.** Desert Fishes Council, Annual Meeting, Death Valley, California, November 20-23, 2003, Poster Presentation CONTRIBUTED.
- Velez, C.E., L.L. Leslie, and S.A. Bonar. 2003. Impact of predation by nonnative fishes on native fishes in the Verde River, Arizona.** Desert Fishes Council, Annual Meeting, Death Valley, California, November 20-23, 2003, Poster Presentation. CONTRIBUTED.
- Widmer, A.M., C.J. Carveth, and S.A. Bonar. 2003. Lethal thermal maxima of native and nonnative fishes in the San Pedro River, Arizona.** Desert Fishes Council, Annual Meeting, Death Valley, California, November 20-23, 2003. CONTRIBUTED.
- Bonar, S.A., B. Bolding, M. Divens, and W. Meyer. 2003. Effects of introduced fishes on coho salmon in small Pacific Northwest lakes and implications for management.** 133rd Annual Meeting of the American Fisheries Society, Quebec City, Quebec, Canada, August 10-14, 2003. CONTRIBUTED.
- Carveth, C.J., A.M. Widmer, and S.A. Bonar. 2003. Lethal thermal maxima of fishes in the San Pedro River, Arizona.** 133rd Annual Meeting of the American Fisheries Society, Quebec City, Quebec, Canada, August 10-14, 2003. CONTRIBUTED.
- Flinders, J.M. and S.A. Bonar. 2003. The biology and foraging demands of northern pike in Arizona lakes and reservoirs.** 133rd Annual Meeting of the American Fisheries Society, Quebec City, Quebec, Canada, August 10-14, 2003. CONTRIBUTED.

- Leslie, L.L., C.E. Velez, and S.A. Bonar. 2003. Diet and consumption rates of introduced fishes in the Verde River, Arizona.** 133rd Annual Meeting of the American Fisheries Society, Quebec City, Quebec, Canada, August 10-14, 2003. CONTRIBUTED.
- Schade, C.S. and S.A. Bonar. 2003. Patterns in the distribution and relative abundance of exotic fish species in the American West.** 133rd Annual Meeting of the American Fisheries Society, Quebec City, Quebec, Canada, August 10-14, 2003. CONTRIBUTED.
- Velez, C.E., L.L. Leslie, and S.A. Bonar. 2003. Impact of predation by nonnative fishes on native fishes in the Verde River, Arizona.** 133rd Annual Meeting of the American Fisheries Society, Quebec City, Quebec, Canada, August 10-14, 2003. CONTRIBUTED.
- Bonar, S.A. 2003. An overview of the Arizona Cooperative Fish and Wildlife Research Unit's Fisheries Programs.** Arizona Anglers Roundtable, Phoenix, Arizona. July 14, 2003. INVITED.
- Bonar, S.A. 2003. Capabilities of the Arizona Cooperative Research Unit.** USFWS Region 2 Research Coordinators' Meeting, Albuquerque, New Mexico. May 22, 2003. INVITED.
- Leslie, L.L., C.E. Velez, and S.A. Bonar. 2003. Fishes of the Verde River. Interactions among native and nonnative fishes.** Center for Impacts of Urban Development in Southern Arizona's Desert Environment (CIUDAD) Annual Meeting, April 25, 2003. CONTRIBUTED.
- Flinders, J.M. and S.A. Bonar. 2003. The biology and foraging demands of northern pike in Arizona lakes and reservoirs.** Western Division Meeting of the American Fisheries Society, San Diego, California. April 14-17, 2003. CONTRIBUTED.
- Bonar, S.A. 2003. Interactions between non-native and native aquatic species and challenges to managing recovery.** USFWS Southwestern Regional Meeting. San Antonio, Texas. January 14-17, 2003. INVITED.
- Bonar, S.A. and A. Didenko. 2002. Standard sampling of desert fish: recent progress, and a call for action.** Desert Fishes Council, Annual Meeting San Luis Potosi, SLP, Mexico, November 14-17, 2002. CONTRIBUTED.
- Bonar, S.A. and W.A. Hubert. 2002. Standard sampling of inland fish: benefits, challenges, and a call for action.** 132<sup>nd</sup> Annual Meeting of the American Fisheries Society, Baltimore, Maryland, August 18-22, 2002. CONTRIBUTED.

- Bonar, S.A. 2002. An overview of the Arizona Cooperative Fish and Wildlife Research Unit.** USFWS Gila, Salt, Verde Watershed Ecoteam Meeting, Phoenix, Arizona, August 6, 2002. INVITED.
- Bonar, S.A. 2002. An overview of the Arizona Cooperative Fish and Wildlife Research Unit.** USFWS Southwest Regional Research Meeting, Albuquerque, New Mexico, May, 2002. INVITED.
- Bonar, S.A., J. Flinders, O.E. Maughan, and W.J. Matter. 2002. Factors associated with razorback sucker recruitment in a small southern Arizona pond.** Arizona-New Mexico American Fisheries Society, Safford, Arizona, February 7-9, 2002. CONTRIBUTED.
- Bonar, S.A. and W.A. Hubert. 2002. Standard sampling of inland fish: benefits, challenges, and a call for action.** Arizona-New Mexico American Fisheries Society, Safford, Arizona, February 7-9, 2002. CONTRIBUTED.
- Didenko, A., S.A. Bonar, and W.J. Matter. 2002. Standard weight equations for rare desert fishes.** Arizona-New Mexico American Fisheries Society, Safford, Arizona, February 7-9, 2002. CONTRIBUTED.
- Flinders, J.M. and S.A. Bonar. 2002. The biology and foraging demands of northern pike in Arizona lakes and reservoirs.** Arizona-New Mexico American Fisheries Society, Safford, Arizona, February 7-9, 2002. CONTRIBUTED.
- Leslie, L.L., C.E. Velez, and S.A. Bonar. 2002. Fishes of the Verde River. Interactions among native and nonnative fishes.** Arizona-New Mexico American Fisheries Society, Safford, Arizona, February 7-9, 2002. CONTRIBUTED.
- Velez, C.E., L.L. Leslie, and S.A. Bonar. 2002. Interactions between native and nonnative fishes in the Verde River, Arizona.** Annual Meeting of the New Mexico/Arizona Chapter of the American Fisheries Society, Safford, Arizona February 7-9, 2002. CONTRIBUTED.
- Bonar, S.A. 2001. Relative length frequency: A simple visual technique to evaluate size structure in fish populations.** 131<sup>st</sup> Annual Meeting of the American Fisheries Society, Phoenix, Arizona, August 19-23, 2001. CONTRIBUTED.
- Bonar, S.A., B. Bolding, M. Divens, and W. Meyer. 2001. Effects of introduced fishes on coho salmon in small Pacific Northwest lakes and implications for management.** 131<sup>st</sup> Annual Meeting of the American Fisheries Society, Phoenix, Arizona, August 19-23, 2001. CONTRIBUTED.

- Schultz, A.A., O.E. Maughan, S.A. Bonar, and W.J. Matter. 2001. Effect of a reservoir on downstream abundance of native and nonnative fishes in a small desert stream.** 131<sup>st</sup> Annual Meeting of the American Fisheries Society, Phoenix, Arizona, August 19-23, 2001. CONTRIBUTED.
- Bonar, S.A. 2001. Relative length frequency: A simple visual technique to evaluate size structure in fish populations.** Arizona Game and Fish Department Agency School. Flagstaff, Arizona, June 12-14, 2001. INVITED.
- Bonar, S.A. 2001. Examining interactions between introduced fish and native aquatic species in Washington state: Implications for Southwestern aquatic ecosystems.** Arizona-New Mexico American Fisheries Society, Gallup, New Mexico, February 1-3, 2001. CONTRIBUTED.
- Bonar, S.A. 2001. Relative length frequency: A simple visual technique to evaluate size structure in fish populations.** Arizona-New Mexico American Fisheries Society, Gallup, New Mexico, February 1-3, 2001. CONTRIBUTED.
- Schultz, A.A., O.E. Maughan, S.A. Bonar, and W.J. Matter. 2001. Effect of a reservoir on downstream abundance of native and nonnative fishes in a small desert stream.** Best Student Paper Award, Arizona-New Mexico American Fisheries Society, Gallup, New Mexico, February 1-3, 2001. CONTRIBUTED.
- Ward, D.L. and S.A. Bonar. 2001. Effects of water temperature and cold shock on predation of flannelmouth suckers by rainbow trout.** Best Student Paper - Arizona-New Mexico American Fisheries Society, Gallup, New Mexico, February 1-3, 2001. CONTRIBUTED.
- Widmer, A.M., C.J. Carveth, and S.A. Bonar. 2001. Lethal thermal maxima of native and nonnative fishes in the San Pedro River, Arizona.** Arizona-New Mexico American Fisheries Society, Gallup, New Mexico, February 1-3, 2001. CONTRIBUTED.
- Bonar, S.A. 2000. Introduced fishes in the American West: Case histories and current research.** School of Renewable Natural Resources Seminar, University of Arizona, Tucson, October, 2000. INVITED.
- Bonar, S.A. 2000. Introduced fishes in the American West: Case histories and current research.** Department of Zoology Seminar, University of Wyoming, Laramie, October 2000. INVITED.
- Bolding, B., S.A. Bonar, and M. Divens. 1999. Use of artificial structure to enhance freshwater sportfish communities.** Washington Department of Fish and Wildlife Warmwater Program Winter Workshop. Wenatchee, Washington, January 25-26, 1999. INVITED.



- Bonar, S.A. 1999. Standard sampling procedures for warmwater fish populations in Washington lakes less than 300 acres.** Washington Department of Fish and Wildlife Warmwater Program Winter Workshop. Wenatchee, Washington, January 25-26, 1999. INVITED.
- Bonar, S.A. and M. Divens. 1999. How to use indexes to evaluate “balance” in a warmwater fish community.** Washington Department of Fish and Wildlife Warmwater Program Winter Workshop. Wenatchee, Washington, January 25-26, 1999. CONTRIBUTED.
- Bonar, S.A., M. Divens, B. Bolding, and W. Meyer. 1999. Recent inland fisheries research at the Washington Department of Fish and Wildlife.** Washington Department of Fish and Wildlife Inland Fish Advisory Board Meeting. Olympia, Washington, January 22, 1999. INVITED.
- Bonar, S.A., B. Bolding, and M. Divens. 1998. An overview of the Washington Department of Fish and Wildlife Inland Fisheries Investigations Unit.** Washington Department of Fish and Wildlife Commission Workshop. Olympia, Washington, November 14, 1998. INVITED.
- Bonar, S.A., M. Divens, and B. Bolding. 1998. Methods for sampling the distribution and abundance of bull trout.** King County Biologists Bull Trout Meeting. Seattle, Washington November 10, 1998. INVITED.
- Bonar, S.A., B. Bolding, and M. Divens. 1998. An overview of the Washington Department of Fish and Wildlife Inland Fisheries Investigations Unit.** Washington Department of Ecology, Lakes Group Meeting. Winter, 1998. INVITED.
- Bonar, S.A., B. Bolding, M. Divens, and W. Meyer. 1998. Interactions between warmwater fish and salmon in Washington state lakes.** Management Implications of Co-occurring Native and Non-Native Species Workshop. Portland, Oregon, October 27-28, 1998. INVITED.
- Bonar, S.A., B. Bolding, and M. Divens. 1998. Management of aquatic plants in Washington State using grass carp, *Ctenopharyngodon idella*. Effects on aquatic plants, water quality and public satisfaction, 1990-1995.** Management Implications of Co-occurring Native and Non-Native Species Workshop. Portland, Oregon. October 27-28, 1998. INVITED.
- Baldwin, C., M. Polacek, and S.A. Bonar. 1998. Factors Limiting Pelagic Fish Production in Lake Roosevelt, Washington: A progress report on research.** Lake Roosevelt Project Meeting. Spokane, Washington, Fall 1998 INVITED.

- Bonar, S.A. 1998. Standard sampling procedures for warmwater fish populations in large Washington lakes.** Washington Department of Fish and Wildlife Warmwater Program Summer Workshop. Olympia, Washington, August 20, 1998. INVITED.
- Bonar, S.A., M. Divens, and B. Bolding. 1998. Methods for sampling the distribution and abundance of bull trout.** *Salvelinus confluentus* Curiosity Society Annual Meeting. Rock Creek, Montana, August 4-6, 1997. INVITED.
- Loch, J. and S.A. Bonar. 1998. Occurrence of Grass Carp in the Lower Columbia and Snake Rivers.** Washington State Lakes Protection Association Annual Meeting. Issaquah, Washington, April 3-4, 1998 INVITED.
- Divens, M. and S.A. Bonar. 1998. Trout stocking in alpine lakes: Proposed research for Washington State.** Washington Department of Fish and Wildlife High Lakes Management Group. Mill Creek, Washington, April, 1998 INVITED.
- Bonar, S.A., M. Divens, and B. Bolding. 1998. Methods for sampling the distribution and abundance of bull trout.** North Pacific International Chapter of the American Fisheries Society General Annual Meeting. Union, Washington, March 18-20, 1998. INVITED.
- Bonar, S.A., B. Bolding, M. Divens, and W. Meyer. 1998. Interactions between warmwater fish and salmon in Washington state lakes.** Washington Department of Fish and Wildlife Inland Fish Advisory Board Meeting. Olympia, Washington, 1998. INVITED.
- Divens, M. and S.A. Bonar. 1998. Trout stocking in alpine lakes: Proposed research for Washington State.** Pacific Northwest Amphibian and Reptile Consortium. Olympia, Washington. INVITED.
- Divens, M. and S.A. Bonar. 1998. Trout stocking in alpine lakes: Proposed research for Washington State.** Washington Department of Fish and Wildlife Inland Fish Advisory Board Meeting. Olympia, Washington, 1998 INVITED.
- Bonar, S.A., M. Divens, and B. Bolding. 1997. Methods for sampling the distribution and abundance of bull trout.** Annual Meeting of the American Fisheries Society. Monterey, California, August 24-28, 1997. CONTRIBUTED.
- Bonar, S.A., B. Bolding, and M. Divens. 1997. Management of aquatic plants in Washington State using grass carp, *Ctenopharyngodon idella*. Effects on aquatic plants, water quality and public satisfaction, 1990-1995.** Western Aquatic Plant Management Society, 16th Annual Conference, Seattle, Washington, March 27-28, 1997. INVITED.

- Bolding, B., S.A. Bonar, and E. Anderson. 1997. Diet of walleye in a percid-centrarchid community.** North Pacific International Chapter of the American Fisheries Society General Annual Meeting. Everett, Washington. March 20, 1997. CONTRIBUTED.
- Divens, M., P. James, S.A. Bonar, B. Bolding, and E. Anderson. 1997. An evaluation of proportional stock density use in Washington State.** North Pacific International Chapter of the American Fisheries Society General Annual Meeting. Everett, Washington. March 20, 1997. CONTRIBUTED.
- Bonar, S.A., B. Bolding, and M. Divens. 1997. Management of aquatic plants in Washington State using grass carp, *Ctenopharyngodon idella*. Effects on aquatic plants, water quality and public satisfaction, 1990-1995.** North Pacific International Chapter of the American Fisheries Society General Annual Meeting. Everett, Washington, March 19-21, 1997. CONTRIBUTED.
- Bonar, S.A., B. Bolding, and M. Divens. 1996. An overview of the Washington Department of Fish and Wildlife Inland Fisheries Investigations Unit.** Washington Department of Fish and Wildlife Inland Fish Advisory Board Meeting. Coulee City, Washington, October 4, 1996. INVITED.
- Bolding, B., S.A. Bonar, M. Divens, and E. Anderson. 1996. Use of walleye to manipulate size and growth rate of stunted yellow perch.** Washington State Lakes Protection Association Tenth Annual Conference. Spokane, Washington, September 26-28, 1996. INVITED.
- Bonar, S.A., B. Bolding, and M. Divens. 1996. An overview of the Washington Department of Fish and Wildlife Inland Fisheries Investigations Unit.** Washington State Lakes Protection Association Tenth Annual Conference. Spokane, Washington, September 26-28, 1996. INVITED.
- Bonar, S.A., B. Bolding, and M. Divens. 1996. Management of aquatic plants in Washington State using grass carp, *Ctenopharyngodon idella*. Effects on aquatic plants, water quality and public satisfaction, 1990-1995.** American Fisheries Society Annual Conference. Dearborn, Michigan, August 25-29, 1996. CONTRIBUTED.
- Bonar, S.A. 1996. Biotic factors affecting harvestable numbers of bass in Washington State.** Washington Department of Fish and Wildlife Bass Management Meeting. Olympia, Washington, July 9-10, 1996. CONTRIBUTED.
- Bolding, B., S.A. Bonar, and E. Anderson. 1996. Diet of walleye in a percid-centrarchid community.** Pacific Fishery Biologist Annual Conference. Silverdale, Washington, March 18-20, 1996. CONTRIBUTED.

- Bonar, S.A., B. Bolding, and M. Divens. 1996. Management of aquatic plants in Washington State using grass carp, *Ctenopharyngodon idella*. Effects on aquatic plants, water quality and public satisfaction, 1990-1995.** Pacific Fishery Biologist Annual Conference. Silverdale, Washington, March 18-20, 1996. INVITED.
- Divens, M., P. James, S.A. Bonar, B. Bolding, and E. Anderson. 1996. An evaluation of proportional stock density use in Washington State.** Pacific Fishery Biologist Annual Conference. Silverdale, Washington, March 18-20, 1996. CONTRIBUTED.
- Bolding, B., S.A. Bonar, and E. Anderson. 1996. Diet of walleye in a percid-centrarchid community.** Washington Department of Fish and Wildlife Inland Fisheries Division Annual Meeting. Wenatchee, Washington. February 28-29, 1996. INVITED.
- Bonar, S.A., B. Bolding, and M. Divens. 1996. Management of aquatic plants in Washington State using grass carp, *Ctenopharyngodon idella*. Effects on aquatic plants, water quality and public satisfaction, 1990-1995.** Washington Department of Fish and Wildlife Inland Fisheries Division Annual Meeting. Wenatchee, Washington, February 28-29, 1996. INVITED.
- Bonar, S.A., M. Divens, and B. Bolding. 1996. Methods for sampling the distribution and abundance of bull trout.** Washington Department of Fish and Wildlife Inland Fisheries Division Annual Meeting. Wenatchee, Washington, February 28-29, 1996. INVITED.
- Divens, M., P. James, S.A. Bonar, B. Bolding, and E. Anderson. 1996. An evaluation of proportional stock density use in Washington State.** Washington Department of Fish and Wildlife Inland Fisheries Division Annual Meeting. Wenatchee, Washington, February 28-29, 1996. INVITED.
- Bonar, S.A., B. Bolding, and M. Divens. 1995. An overview of the Washington Department of Fish and Wildlife Inland Fisheries Investigations Unit.** Federal Aid Coordinators Annual Conference, Seattle, Washington, October 30-November 3, 1995. INVITED.
- Bonar, S.A., B. Bolding, and M. Divens. 1995. Management of aquatic plants in Washington State using grass carp, *Ctenopharyngodon idella*. Effects on aquatic plants, water quality and public satisfaction, 1990-1995.** Washington State Lake Protection Ninth Annual Conference. Ocean Shores, Washington, September 8-9, 1995. INVITED.

- Bonar, S.A., J. Pahutski, B. Bolding, and M. Divens. 1995. Factors affecting survival and growth of channel catfish in Washington State.** Annual Meeting of the American Fisheries Society. Tampa, Florida, August 27-31, 1995. CONTRIBUTED.
- Bonar, S.A., B. Bolding, and M. Divens. 1995. An overview of the Washington Department of Fish and Wildlife Inland Fisheries Investigations Unit.** Washington Department of Fish and Wildlife, Resource Assessment Division Seminar. Olympia, Washington, May 17, 1995. INVITED.
- Bolding, B., S.A. Bonar, M. Divens, and E. Anderson. 1995. Use of walleye to manipulate size and growth rate of stunted yellow perch.** Pacific Fishery Biologist Annual Conference, Poster Presentation. Newport, Oregon, March 20, 1995. CONTRIBUTED.
- Bolding, B., S.A. Bonar, M. Divens, and E. Anderson. 1995. Use of walleye to manipulate size and growth rate of stunted yellow perch.** Washington Department of Fish and Wildlife Inland Fisheries Division Meeting. Lacey, Washington, February 23-24, 1995 (Regional Meeting). INVITED.
- Bonar, S.A., J. Pahutski, B. Bolding, and M. Divens. 1995. Factors affecting survival and growth of channel catfish in Washington State.** Washington Department of Fish and Wildlife Inland Fisheries Division Meeting. Lacey, Washington, February 23-24, 1995. INVITED.
- Bonar, S.A. 1994. Grass carp policy in Washington State.** Grass Carp Symposium. Gainesville, Florida, March 7-9, 1994. INVITED.
- Bonar, S.A., G.B. Pauley, G.L. Thomas, J.D. Frodge, D.A. Marino, S.L. Thiesfeld, S. Vecht, K.L. Bowers, and H. Sehgal. 1994. Use of grass carp for aquatic plant control in the Pacific Northwest: Case histories and current research.** Grass Carp Symposium. Gainesville, Florida, March 7-9, 1994. INVITED.
- Bonar, S.A., G.L. Thomas, and G.B. Pauley. 1994. An empirical approach to grass carp stocking rates.** Grass Carp Symposium. Gainesville, Florida, March 7-9, 1994. INVITED.
- Bolding, B., S.A. Bonar, M. Divens, and E. Anderson. 1994. Use of walleye to manipulate size and growth rate of stunted yellow perch.** 1994 Annual General Meeting, North Pacific International Chapter of the American Fisheries Society. Wenatchee, Washington, February 10, 1994. INVITED.

- Bonar, S.A., B. Bolding, D. Fletcher, and W. Zook. 1994. Warmwater fish communities in Washington lakes: Assessment and implications for management.** Annual General Meeting, North Pacific International Chapter of the American Fisheries Society. Wenatchee, Washington, February 10, 1994. CONTRIBUTED.
- Bonar, S.A. 1993. An overview of Washington Department of Wildlife warmwater fisheries research.** Warmwater Fisheries Shortcourse. Auburn University, Auburn, Alabama, May 18-21, 1993. INVITED.
- Bonar, S.A. 1993. An overview of Washington Department of Wildlife warmwater fisheries research.** Washington Department of Wildlife Annual Biologists Meeting. Yelm, Washington, February 16-19, 1993. INVITED.
- Bonar, S.A. 1992. Comparison of limnological requirements for warmwater and coldwater fish.** Washington State Lakes Protection Association Sixth Annual Conference. Spokane, Washington, September 10-12, 1992. INVITED.
- Bonar, S.A., G.B. Pauley, G.L. Thomas, J.D. Frodge, D.A. Marino, S.L. Thiesfeld, S. Vecht, K.L. Bowers, and H. Sehgal. 1992. Use of grass carp for aquatic plant control in the Pacific Northwest: Case histories and current research.** Washington State Lakes Protection Association Sixth Annual Conference. Spokane, Washington, September 10-12, 1992. INVITED.
- Bonar, S.A., G.B. Pauley, and G.L. Thomas. 1991. Effect of aquatic plant tissue composition, fish size, circadian rhythm, and disturbance on the feeding preference and consumption rate of triploid grass carp.** Annual Meeting of the Western Aquatic Plant Management Society. Seattle, Washington, March 14-15, 1991. INVITED.
- Bonar, S.A., G.L. Thomas, and G.B. Pauley. 1991. Recent advances on an interactive data-base model to predict grass carp stocking rates for aquatic plant control.** Annual Meeting of the Western Aquatic Plant Management Society. Seattle, Washington, March 14-15, 1991. INVITED.
- Bonar, S.A., G.L. Thomas, and G.B. Pauley. 1990. Recent advances on an interactive data-base model to predict grass carp stocking rates for aquatic plant control.** Annual Meeting of the American Fisheries Society. Pittsburgh, Pennsylvania, August 26-30, 1990. INVITED.
- Bonar, S.A., G.L. Thomas, and G.B. Pauley. 1989. An interactive data-base model to predict grass carp stocking rates for aquatic plant control.** Annual Meeting of the American Fisheries Society. Anchorage, Alaska, September 4-8, 1989. CONTRIBUTED.

- Bonar, S.A., G.L. Thomas, G.B. Pauley, and R.W. Martin. 1989. Use of ultrasonic imaging for rapid, non-lethal determination of the sex and maturity of pacific herring (*Clupea harengus pallasii*).** North Pacific International Chapter Meeting of the American Fisheries Society. New Westminster, British Columbia, March 7-8, 1989. CONTRIBUTED.
- Bonar, S.A., G.L. Thomas, and G.B. Pauley. 1988. Determination of stocking densities for triploid grass carp for the Pacific Northwest.** Annual USFWS Workshop (Seattle Area). Port Townsend, Washington, August 10, 1988. INVITED.
- Bonar, S.A., G.L. Thomas, and G.B. Pauley. 1987. Determination of stocking densities for triploid grass carp for the Pacific Northwest.** Annual Washington State Department of Game. Fisheries Biologist Meeting, Port Townsend, Washington, June 15, 1987. INVITED.
- Bonar, S.A., G.L. Thomas, and G.B. Pauley. 1987. Determination of stocking densities for triploid grass carp for the Pacific Northwest.** Northwest Scientific Association 60th Annual Meeting. March 26-28, 1987. CONTRIBUTED.
- Bonar, S.A., G.L. Thomas, G.B. Pauley, and A. Unthank. 1987. Evaluation of ploidy separation techniques with the grass carp (*Ctenopharyngodon idella*), a potential biological control of aquatic macrophytes in Washington State.** Annual Washington State Department of Game Fisheries Biologist Meeting. Port Townsend, Washington, March 3-5, 1987. INVITED.
- Thomas, G.L., S.L. Thiesfeld, and S.A. Bonar. 1987. Hydroacoustic quantification of fish habitat in lakes infested with aquatic macrophytes.** International Symposium on Fisheries Acoustics. Seattle, Washington 1987 CONTRIBUTED.
- Bonar, S.A., G.L. Thomas, and G.B. Pauley. 1986. Determination of stocking densities for triploid grass carp for the Pacific Northwest.** North American Lake Management Meeting. Portland, Oregon, November 3-7, 1986. INVITED.
- Bonar, S.A., G.L. Thomas, and G.B. Pauley. 1986. Determination of stocking densities for triploid grass carp for the Pacific Northwest.** 21st Annual Meeting of the Aquatic Plant Control Program. Mobile, Alabama, November, 1986. INVITED.
- Bonar, S.A., G.L. Thomas, and G.B. Pauley. 1986. Estimation of triploid white amur stocking densities for aquatic plant control for Devils Lake, Oregon.** 21st Annual Meeting, Aquatic Plant Control Research Program. Mobile, Alabama, November 1986. INVITED.

- Pauley, G.B., G.L. Thomas, S.L. Thiesfeld, S.A. Bonar, and K.L. Bowers. 1986. An overview of the use of triploid grass carp (*Ctenopharyngodon idella*) as a biological control of aquatic macrophytes in Devils Lake, Oregon.** 21st Annual Meeting of the Aquatic Plant Control Research Program. Mobile, Alabama, November 1986. INVITED.
- Bonar, S.A., G.L. Thomas, G.B. Pauley, and A. Unthank. 1985. Evaluation of ploidy separation techniques with the grass carp (*Ctenopharyngodon idella*), a potential biological control of aquatic macrophytes in Washington State.** Annual American Fisheries Society Meeting. Sun Valley, Idaho, September 13-18, 1985 (National Meeting). Poster Session. CONTRIBUTED.
- Bonar, S.A., G.L. Thomas, G.B. Pauley, and A. Unthank. 1985. Evaluation of ploidy separation techniques with the grass carp (*Ctenopharyngodon idella*), a potential biological control of aquatic macrophytes in Washington State.** Aquatic Plant Management Society Meeting. Vancouver, British Columbia, July 21-24, 1985. CONTRIBUTED.
- Pauley, G.B., G.L. Thomas, S.A. Bonar, and A. Unthank. 1985. An overview of the use of triploid grass carp (*Ctenopharyngodon idella*) as a biological control of aquatic macrophytes in Washington State.** Aquatic Plant Management Society Meeting. Vancouver, British Columbia, July 21-24, 1985. CONTRIBUTED.
- Bonar, S.A., G.L. Thomas, G.B. Pauley, and A. Unthank. 1985. Evaluation of ploidy separation techniques with the grass carp (*Ctenopharyngodon idella*), a potential biological control of aquatic macrophytes in Washington State.** North Pacific International Chapter Meeting of the American Fisheries Society. Port Angeles, Washington, March 25-27, 1985. CONTRIBUTED.
- Pauley, G.B., G.L. Thomas, S.A. Bonar, and A. Unthank. 1985. An overview of the use of triploid grass carp (*Ctenopharyngodon idella*) as a biological control of aquatic macrophytes in Washington State.** North Pacific International Chapter Meeting of the American Fisheries Society. Port Angeles, Washington, March 25-27, 1985. CONTRIBUTED.
- Pauley, G.B., G.L. Thomas, S.A. Bonar, and A. Unthank. 1985. An overview of the use of triploid grass carp (*Ctenopharyngodon idella*) as a biological control of aquatic macrophytes in Washington State.** Annual Washington State Department of Game Fisheries Biologist Meeting. Lake Flora, Washington, February 25-27, 1985. INVITED.
- Bonar, S.A., G.L. Thomas, G.B. Pauley, and A. Unthank. 1985. Evaluation of ploidy separation techniques with the grass carp (*Ctenopharyngodon idella*), a potential biological control of aquatic macrophytes in Washington State.** Annual Washington State Department of Game Fisheries Biologist Meeting. Lake Flora, Washington, February 25-27, 1985. INVITED.



**Pauley, G.B., G.L. Thomas, S.A. Bonar, and A. Unthank. 1985. An overview of the use of triploid grass carp (*Ctenopharyngodon idella*) as a biological control of aquatic macrophytes in Washington State.** Annual Weed Science Society of America Meeting. Seattle, Washington, February 6-8, 1985 INVITED.

**Bonar, S.A., G.L. Thomas, G.B. Pauley, and A. Unthank. 1985. Evaluation of ploidy separation techniques with the grass carp (*Ctenopharyngodon idella*), a potential biological control of aquatic macrophytes in Washington State.** Annual Weed Science Society of America Meeting. Seattle, Washington, February 6-8, 1985. INVITED.

**Bonar, S.A., G.L. Thomas, G.B. Pauley, and A. Unthank. 1984. Evaluation of ploidy separation techniques with the grass carp (*Ctenopharyngodon idella*), a potential biological control of aquatic macrophytes in Washington State.** 19th Annual Meeting of the Aquatic Plant Control Research Program. Galveston, Texas, November 27-29, 1984. INVITED.

**Pauley, G.B., G.L. Thomas, S.A. Bonar, and A. Unthank. 1984. An overview of the use of triploid grass carp (*Ctenopharyngodon idella*) as a biological control of aquatic macrophytes in Washington State.** 19th Annual Meeting of the Aquatic Plant Control Research Program. Galveston, Texas, November 27-29, 1984. INVITED.

c. RENDERING SCIENTIFIC JUDGMENT

- **Reviewer** - Asked to review articles for the *Canadian Journal of Fisheries and Aquatic Sciences*, *Environmental Biology of Fishes*, *Western North American Naturalist*, *Journal of Aquatic Plant Management*, *Transactions of the American Fisheries Society*, *Journal of Fish Biology*, *North American Journal of Fisheries Management*, *Fisheries Management and Ecology*, *Northwest Science*, and *Great Basin Naturalist*.
- **National American Fisheries Society Book Editorial Advisory Board** – Member-May 2002 to present. Board function is to recommend which books the American Fisheries Society publishes.
- **Desert Fish Scientific Advisor. U.S. Forest Service In-Stream Flow Legal Team**, U.S. Forest Service, Arizona Game and Fish Department, (January 2008 - Present). Provides advice on in-stream flow requirements for imperiled native fishes for court cases, mainly those concerned with mining activities near desert streams.
- **Desert Fish Scientific Advisor. U.S. Department of Justice and Bureau of Land Management Legal Team**, U.S. DOJ, BLM, (March 2013 – Present). Provides advice on in-stream flow requirements for imperiled native fishes for court cases.

- **Desert Fishes Conservation Team** – Arizona Game and Fish Department – Makes recommendations to AGFD Management on Desert Fish activities statewide. Coordinates activities with other agencies. Member March 2003 to present.
- **Devils Hole Pupfish Recovery Team** – Asked to provide input to Devils Hole Pupfish recovery, U.S. Fish and Wildlife Service/National Park Service. (Critically endangered, 35 individual fish now in existence, fish subject of U.S. Supreme Court Decision on water rights)
- **Moapa Dace Recovery Team** – Asked to provide input to Moapa Dace recovery, U.S. Fish and Wildlife Service. (Critically endangered, 500-1000 individual fish in existence).
- **Mohave Tui Chub Recovery Team** – U.S. Fish and Wildlife Service/National Park Service. Part of a team recommending recovery actions for the endangered Mohave Tui Chub of the Mohave Desert, California. (Critically endangered, three populations exist in the world).
- **USGS Research Grade Evaluation Panel**, San Antonio Texas, February 9, 2006

#### d. LECTURESHIPS AND OTHER ACADEMIC SERVICE

I served as major professor for the following graduate students who graduated from the University of Arizona:

- Price, Joy E. *Potential methods to cool streams containing Apache trout in the White Mountains of Arizona and implications for climate change*. MS. Thesis, University of Arizona, Tucson Spring 2013. Currently seeking employment.
- Recsetar, Matthew S. *Thermal tolerance of Apache trout at various life stages*. MS. Thesis, University of Arizona, Tucson Spring 2011. Currently employed as an Extension Aquaculture Specialist at University of Arkansas at Pine Bluff.
- Mapula, Justin A.. *Relationship between food type and growth and survival of larval hybrid Devils Hole pupfish*. MS. Thesis, University of Arizona, Tucson Fall 2011. Currently employed as a U.S. Forest Service biologist in Shasta, California.
- Sontz, Erica A. *Spawning and culture of headwater chub (*Gila nigra*) and roundtail chub (*Gila robusta*)*. MS. Thesis, University of Arizona, Tucson Fall 2010. Currently employed with the University of Arizona Animal Care and Use Facility.
- Schultz, Andrew A. *Selected aspects of the natural history and culture of Gila chub*. Ph.D. Dissertation. Spring 2009. Currently employed as a Fisheries Research Biologist with the Bureau of Reclamation in Byron, California.

- Archdeacon, Thomas P. *Effects of Asian tapeworm, mosquitofish, and food ration on growth and survival of Mohave tui chub*. MS. Thesis, University of Arizona, Tucson Spring 2007. Currently employed as a biologist with the US Fish and Wildlife Service, Albuquerque, New Mexico.
- Carveth, Cori. *A comparison of the upper thermal tolerance of native and nonnative fish species in Arizona*. M.S. Student. Spring 2005. Currently employed as a fisheries manager with the Ontario Ministry of the Environment.
- Didenko, Alexander. *Development of standard weight (Ws) equations for roundtail chub, flannelmouth sucker, razorback sucker, and humpback chub*. M.S. Thesis, University of Arizona, Tucson. Spring 2002. Currently employed at the Institute of Fisheries of the Ukrainian Academy of Agrarian Sciences in Kiev, Ukraine as a research fisheries biologist.
- Kline, S. Jason. *Effects of Asian tapeworm (Bothriocephalus acheilognathi) exposure on growth and mortality of Yaqui chub (Gila purpurea) and Yaqui topminnow (Poeciliopsis occidentalis sonoriensis)*. M.S. Thesis, University of Arizona, Tucson, Spring 2007. Currently employed as a biologist with the Arizona Game and Fish Department, Tucson Arizona.
- Flinders, Jon. *Biology and foraging demands of northern pike in three Arizona reservoirs and their distribution and status in the southwestern United States*. M.S. Thesis, University of Arizona, Tucson. Fall/Winter 2003-4. Currently a fisheries biologist with the Idaho Department of Fish and Game.
- Leslie, Laura. *Diet and consumption rates of nonnative fishes in the Verde River, Arizona*. M.S. Thesis, University of Arizona, Tucson. Summer 2003. Currently employed as an environmental consultant in Cody, Wyoming.
- Rogers, Scott. *Spawning and recruitment of flannelmouth suckers in the tailwater to Glen Canyon Dam, Colorado River, Arizona*. M.S. Thesis, University of Arizona, Tucson. Spring 2003. Currently employed as a Regional Fisheries Biologist by the Arizona Game and Fish Department in Flagstaff, Arizona.
- Rogowski, David. *Optimizing methods to control nuisance northern crayfish, Orconectes virilis in Arizona*. Post-Doctoral, University of Arizona, Tucson. 2007-2008. Hired as an Assistant Professor of Fisheries at Texas Tech University, Lubbock, Texas.
- Schade, Charles. *Factors associated with the distribution and abundance of non-native fishes in streams of the American West*. M.S. Thesis, University of Arizona, Tucson. Fall 2003. Currently employed as a biologist with the USFWS in Ventura, California.

- Velez, Cristina. *Impact of nonnative fish predation on native fishes in the Verde River, Arizona*. M.S. Thesis, University of Arizona, Tucson Spring, 2004. Currently employed as Research Station Manager, Cuatro Ciénegas Research Station, Cuatro Ciénegas, Coahuila, Mexico.
- Ward, David. *Effects of reduced water temperature on swimming performance and predation vulnerability of age-0 flannelmouth sucker*, M. S. Thesis, University of Arizona, Tucson. Summer 2001. Currently employed as a Grand Canyon Fisheries Research Biologist by the USGS Grand Canyon Monitoring and Research Center, Flagstaff, Arizona.
- Widmer, Ann. *Upper temperature tolerance of loach minnow under acute, chronic, and fluctuating thermal regimes*. M.S. Student. Fall 2004. Currently employed as an environmental consultant in Denver, Colorado.

I am the major professor of the following students who are currently in the program at the University of Arizona:

Ambre Chaudoin – M.S.  
 Olin Feuerbacher – M.S.  
 Sally Petre – M.S.  
 Jack Ruggirello – M.S.  
 Stephani Clark – M.S.

Three more students are scheduled to start Fall, 2013 and two of these will graduate by Fall, 2013. I have also served on the graduate committees of eight MS and three Ph.D. students.

### **Teaching Service**

- Taught Independent Study, RNR 599 for international Ph.D. student on subject of North American Fisheries Management. Fall, 2012.
- Lectured in many undergraduate and graduate courses. These include: Wildlife Conservation and Society WFSC 225, Principles of Research RNR 546, Conservation Biology ECOL 406R, Adaptation to Climate Change: Perspectives at the Nexus of Science, Society, and Resource Management RNR 440/540 at the University of Arizona; Fisheries 101, Fisheries 367, and Civil Engineering 555 at the University of Washington, Schools of Engineering and Fisheries; Warmwater Fisheries Management Short Course, Auburn University, Auburn, Alabama.
- Seminar, The rarest fish in the world. Desert fish management and recovery. University of Arizona, April 2008.

- Seminar, How to persuade people – Lessons from psychology and marketing for the fish and wildlife biologist. US Fish and Wildlife Service Headquarters, Arlington, Virginia, December 2007.
- Seminar, Conservation Seminar Series, The conservation professional's guide to working with people. Fall, 2007.
- Co-Taught, Fish and Wildlife Ecology, Wildlife and Fisheries Sciences 696a, University of Arizona. Discussion and readings course on subjects in aquatic ecology and management. Responsible for assigning topics, grading and co-leading class discussions. Spring 2004.
- Before 2003 - The researcher presented several seminars on western fisheries subjects at the University of Wyoming, Laramie, the University of Washington, Seattle and at the University of Arizona, Tucson.
- Taught Advanced Inland Fisheries Management, Wildlife and Fisheries Science 515, University of Arizona. Responsible for lectures, field trips, testing and special projects. Alternate years, starting Spring 2002. Currently combine and co-teach with Fisheries Management as well.
- Teach the graduate course Biopolitics, Wildlife and Fisheries Science 595a, University of Arizona. Responsible for lectures, coordinating speakers, testing and special projects. Alternate years, starting Spring 2001.
- Co-Taught Recreational Fisheries, Fisheries 367, University of Washington, School of Fisheries, 1994. Taught sections on management and biology of warm water fisheries; aquatic ecology, and limnology in other years. Prepared lesson plans, prepared and graded tests, prepared laboratory material.
- Advised many other undergraduate and graduate students from the University of Washington, Washington State University, Central Washington University and the University of Arizona on research design and techniques.
- Supervised student interns on Washington Department of Fish and Wildlife research projects from The Evergreen State University and Peninsula College. Supervised many student volunteers on WDFW projects from the University of Washington, Washington State University, Peninsula College and Central Washington University.
- Served as Teaching Assistant, Fisheries 367, Recreational Fisheries, University of Washington, 1984. Assisted professors with preparation of lecture materials, field trip logistics and grading of tests and homework assignments for an upper division fisheries class of approximately 40 individuals.

### **Other academic service:**

- Faculty supervisor of the Minority Student Training Program at the University of Arizona's School of Natural Resources. 2000 – 2006. This program supports up to 12 graduate and undergraduate minority students with an interest in natural resources. It pays 2 graduate stipends and for undergraduate internships with University faculty and graduate students, and government agencies. The researcher works with the Minority Student Training Program Coordinator (a Ph.D. student) to mentor students, help find them internship experience, and help them with employment during graduation. In 2006, I asked assistant unit leader to lead program.
- The researcher serve(d) on the Laboratory, Policy (elected by faculty), Awards and Recruitment Committees for the School of Renewable Natural Resources at the University of Arizona. 2000-present.

### **e. TECHNICAL TRAINING PROVIDED**

- Bonar, S. A., *AFS Standard Methods for Sampling and Comparing Your Data with North American Standards*. 73rd Midwest Fish and Wildlife Conference, Wichita, Kansas December 9 – 12, 2012 (Invited Workshop).
- Bonar, S. A., *The Conservation Professional's Guide to Working with People*. The 45th annual meeting of the Montana Chapter of the American Fisheries Society. Helena Montana, 6 – 10 February 2012 (Invited Workshop).
- Bonar, S. A., *The Conservation Professional's Guide to Working with People*. Texas Parks and Wildlife, Inland Fisheries Biologists Annual Meeting, Fredricksburg, Texas, August 2008 (Invited Workshop).
- Bonar, S. A., *The Conservation Professional's Guide to Working with People*. Arizona Game and Fish Department Agency School, Flagstaff, Arizona, June 2008 (Invited Workshop).
- Bonar, S. A., *Biology of Aquatic Weeds: Fish and Plant Interactions*. University of California Davis Aquatic Weed School, Davis, California. November 2007 (Invited Short Course).
- Bonar, S.A., *The Conservation Professional's Guide to Working with People*. U.S. Fish and Wildlife Service, Arlington, Virginia, November 2007 (Invited Workshop).
- Bonar, S.A., *The Conservation Professional's Guide to Working with People*, American Fisheries Society 137<sup>th</sup> Annual Meeting, San Francisco, California. September 2-6, 2007 (Contributed Workshop).

- Bonar, S.A., *Use of Grass Carp for Aquatic Plant Control*. Portland State University, Aquatic Plant Control School. Portland, Oregon, September 2004 (Invited Short Course).
- Bonar, S.A. *Aquatic Plants – Fish Interactions*. Portland State University, Aquatic Plant Control School. Portland, Oregon, September 2004 (Invited Short Course).
- Bonar, S.A., *Biopolitics*. Arizona Game and Fish Department Agency School. Flagstaff, Arizona. June 2003 (Invited Short Course).
- Bonar, S.A., *Standard Sampling Techniques for Fish Surveys*. Arizona Game and Fish Department Agency School. Flagstaff, Arizona. June 2001 (Invited Short Course).

**f. SPECIAL ASSIGNMENTS.**

See under 13 for information about assignment to work with scientists in the Ukraine on piscivore management.

## **g. OTHER TECHNICAL ACTIVITIES**

I regularly consult for and exchange information with government agencies, primarily Arizona Game and Fish Department, Nevada Division of Wildlife, U.S. Fish and Wildlife Service, U.S. Forest Service, Bureau of Land Management, Bureau of Reclamation and National Park Service biologists on fish sampling techniques and desert fish management. The nature of the position requires me to consult closely with management biologists to conduct research critical to management interests. I provide technical support to Arizona Game and Fish Department biologists and managers on standard sampling protocols, native-nonnative fish interactions and management, habitat management and native fish propagation techniques. Technical support is being used by the Agency to develop management plans, sampling protocols and policies. Information on the life history, flow requirements and temperature tolerances of Arizona fishes is being provided to the Bureau of Land Management, and U.S. Forest Service for use in court cases to protect water levels in desert rivers. Technical advice on introduced species (Asian tapeworm, and nonnative sportfish) has been provided to managers with the U.S. Fish and Wildlife, the Utah Division of Wildlife, the Nevada Division of Wildlife, California Fish and Game, the National Park Service, the USGS to aid in management strategies. I provide technical advice on endangered desert fish ecology, management and captive breeding to the U.S. Fish and Wildlife Service, the National Park Service, Nevada Division of Wildlife, and Southern Nevada Water Authority. I provided technical support to the Washington Department of Fish and Wildlife and the Washington Department of Ecology on grass carp management and biology, native fish management, the management of warmwater fishes and introduced fish/native fish interactions, and standard sampling protocols for lake and pond fishes and bull trout. Technical support on the interactions between salmon and introduced fishes was provided to managers from the Provincial Government of British Columbia, Canada to protect rivers and lakes in that province from private stockings of introduced sportfishes.

I have been asked to give workshops on standard fisheries sampling and communications techniques to USGS, USFWS, and Texas, Montana, Arizona and Kansas state biologists.

In addition to working with government agencies on fisheries issues, I have also provided technical information to private organizations. For example, I was a regular contributor to Bass Angler's Sportsmen Society newsletters, discussing angling regulations and the dangers of illegally introducing nonnative fish. I consulted with Trout Unlimited on issues regarding the protection of Apache Trout in the White Mountains, Arizona. I consulted with biologists and managers of the Salt River Project (Hydroelectric and Irrigation), Arizona on managing Arizona Rivers for native fish enhancement. I regularly met with lake management groups to discuss small lake fishery management, and the use of grass carp to control aquatic plants.



## **(15) TECHNOLOGY AND INFORMATION TRANSFER AND DISSEMINATION**

**Developed North American Standard Database on Fish Growth, Condition, Catch per Effort and Length Frequency.** As part of a three person team, I obtained over 4000 data sets from 42 states and Canadian provinces and developed ranges and means (rangewide and by ecoregion) of common fisheries indices for North America. Comparison with these indices can be used to help evaluate the health of a fish population. These data were presented in *Standard Methods for Sampling Freshwater Fishes in North America*.

**Developed <http://fisheriesstandardsampling.org>: A simple web-based tool to analyze standard fish data.** I led a team of three programmers to develop an on-line web-accessible tool to compare fish growth, condition, length-frequency, and catch per unit effort data collected using AFS standard methods with a simple click of a button. This tool continues to build on itself, and calculates new, updated summaries when new data is entered, similar to Wikipedia. Development of this tool was a collaborative effort among the American Fisheries Society, the US Geological Survey, the National Park Service, the U.S. Forest Service, the University of Arizona, the University of Guadalajara, and others. This web-based tool (1) provides on-line summaries of more than 4000 data sets of condition, length-frequency, CPUE and growth indices of common freshwater fishes, collected using standard gears from 42 states and provinces across North America; (2) allows easy entry of new data collected using standardized methods, so summaries can be rapidly updated; and (3) allows users to quickly compare condition, growth and abundance of fish collected in a particular water body with regional (continent, ecoregion and state) and rangewide averages and percentiles, thus increasing resource information for a variety of areas. The site was programmed in a PHP-based Drupal framework and was invited for demonstration at the AFS Annual Meeting in Minneapolis, and at workshops and symposia at the AFS Division Meetings in the South and Midwest. It will be the subject of a workshop at the AFS Annual Meeting in Little Rock this September.

**Developed Arizona Cooperative Fish and Wildlife Research Unit Web Page.** I worked with other members of the USGS Arizona Cooperative Fish and Wildlife Research Unit to develop a home page of the unit's activities and purpose.

**Provided Informal Learning Opportunities for Volunteers.** My graduate students enlisted the help of over 300 volunteers on USGS Arizona Coop Unit aquatic projects. These volunteers have included media representatives, management officials of state and federal agencies, representatives of various outdoor sports groups (angling groups) and conservation organizations (Sierra Club). My students used their experience to write an article in *Fisheries* on volunteer management techniques.

**Visited Schools to Interest Students in Fisheries.** I have given presentations to many public school classes on desert fish biology and general fish biology and management.

**Rescued Endangered Fishes During the Aspen Wildfire.** My lab and I aided the USFWS, the Arizona Game and Fish Department, and the USFS to rescue a population of endangered fishes from the advancing Aspen Wildfire in Sabino Canyon, Arizona. We helped capture fish in advance of the fire, and held them while habitat was restored. This project was featured on CBS, and many local TV news stations. Several newspaper articles on this project appeared throughout the Southwest.

**Media Interviews and Press Releases.** My research and/or that of my graduate students has been featured in the Seattle Times, Los Angeles Times, Las Vegas Sun, several Seattle TV stations, the Bremerton (WA) Sun, and Arizona newspapers. It has been used in the development of the Arizona Game and Fish Department's TV program, *The Desert Speaks*. My research has also been featured in Arizona Game and Fish Department instructional videos.

The following news articles, press releases and television interviews have appeared about research and activities in which I was involved.

1. Pupfish's 'Tsunami' struggle captured on video for first time. Thaindian News and Asian News International, 5/12/2010.
2. Video Captures Pupfish Struggling During Earthquake. Discovery News, 5/12/2010. *Tsunami in Devils Hole captured on videography project of my graduate student.*
3. Caught on tape: Mexican quake causes mini-tsunami in Nevada desert, 5/11/2010. Tucson News Now, KOLD and KMSB news.
4. UA 'Tsunami' Video Sheds Light on Struggling Pupfish. UA News, 5/10/2010. *Describes first time earthquake in Devils Hole was captured by video (by one of my graduate students), and its effect on pupfish.*
5. Devil's Hole pupfish surf through a mini tsunami. Los Angeles Times, 4/27/2010.
6. People skills for the conservation professional. Cagan H. Sekercioglu. Ecology 89(3)882-883., March 2008. *Describes and reviews my book, "The conservation professional's guide to working with people".*
7. Book Review: The conservation professional's guide to working with people. Jeffery V. Yule. Quarterly Review of Biology. March, 2008. *Describes and reviews my book, "The conservation professional's guide to working with people".*
8. New Books: The conservation professional's guide to working with people. Fish Soup. 38(3), Fall 2007. AZ-NM Chapter, American Fisheries Society Newsletter. *Describes and reviews my book, "The conservation professional's guide to working with people".*
9. Environmentalists should learn to work well with people, book argues. Anne W. Howard, The Chronicle of Philanthropy, Pg. 56 Vol. 19 No. 23. 9/20/2007. *Describes and reviews my book, "The conservation professional's guide to working with people".*
10. Conservation news you can use. Journal of Soil and Water Conservation/Aug 2007. *Describes and reviews my book, "The conservation professional's guide to working with people".*

11. Book Review: The conservation professional's guide to working with people, by Scott Bonar. Wendy Rash. Runoff. California-Nevada Chapter Newsletter of the Soil and Water Conservation Society. Summer 2007. *Describes and reviews my book, "The conservation professional's guide to working with people"*.
12. The conservation professional's guide to working with people. John Cangany, Island Press Release 5/16/2007. *Describes my book, "The conservation professional's guide to working with people"*.
13. Coalition hopes to reduce non-native fish in Nevada streams. Steve Timko, Reno Gazette-Journal (NV), 5/14/06. *Describes nonnative fish distribution in Nevada obtained from our on nonnative fishes across the western United States.*
14. Latest news in brief from northern Nevada. Las Vegas Sun, 5/14/2006. *Describes study we conducted estimating distribution and abundance of nonnative fishes across the Western United States.*
15. Non-Native Fish Taking Over Western Streams. FOX News. 5/08/2006. *Describes study we conducted showing distribution and abundance of nonnative fishes across the Western United States.*
16. Non-native fish invade Western streams. Robert Roy Britt, LiveScience, 5/5/2006. *Describes study we conducted estimating distribution and abundance of nonnative fishes across the Western United States.*
17. USGS finds one in four fishes in non-native in 12 Western states: Non-natives flourish in half of streams studied. USGS Press Release. Federal News Service, Reston Virginia 5/4/2006. *Describes study we conducted estimating distribution and abundance of nonnative fishes across the Western United States.*
18. Fisheries; Non-native fish widespread in West, study says. April Reese, Land Letter, 4/27/2006. *Describes study we conducted estimating distribution and abundance of nonnative fishes across the Western United States.*
19. Non-native fish major issue in state's waters. Some imports prized by Montana anglers. Mike Stark, Billings Gazette, Billings, Montana. 4/21/2006. *Describes our study on nonnative fishes across the western United States and implications for Montana.*
20. Gila Chub Return Home. KOLD News, Tucson 5/10/05. *Describes repatriation of Gila chub into Sabino Canyon following the Aspen Fire.*
21. Endangered Gila chub fish return home. Associated Press 5/11/05. *Describes repatriation of Gila chub in Sabino Canyon following the Aspen fire.*
22. Researchers study parasites in mosquitofish collected from local waters. News Release, Dominican University, San Rafael, California, Spring 2005. *Describes studies on Asian tapeworm conducted with advice/collaboration with me.*
23. Arizona hopes to return rare fish to the wild. Associated Press 4/7/2004. *Describes holding and propagation of Gila Chub.*
24. Fish evacuated because of wildfire may return by year's end. The Associated Press State and Local Wire. 4/7/2004. *Describes holding and repatriation of Gila chub.*
25. Sabino Creek chub standing by. Mitch Tobin, Arizona Daily Star, Tucson, Arizona. 4/7/2004. *Describes holding and propagation of Gila Chub.*

26. Crews rescue rare fish from wildfire's residue – Gila chubs proposed for federal protection. Seattle Times (WA) July 2, 2003. *Describes relocation of Gila chub population threatened by wildfire by my staff in collaboration with USFWS, USFS and AZGFD.*
27. Saviors scoop up hundreds of rare fish – Gila chubs' creek at risk from post – fire runoff. Arthur H. Rotstein, Associated Press. Lexington Herald-Leader (KY)- 7/2/2003. *Describes relocation of Gila chub population threatened by wildfire by my staff in collaboration with USFWS, USFS and AZGFD.*
28. Fish rescue in Arizona. Species threatened by wildfire debris is moved to clear water. CBS News. 7/1/2003. *Describes relocation of Gila chub population threatened by wildfire by my staff in collaboration with USFWS, USFS and AZGFD.*
29. Shocking science: Sampling the Verde. Art Merrill, Prescott Valley Tribune 5/15/02. *Describes our research on nonnative predator –prey interactions conducted on the Verde River.*

### Popular Articles

1. **Bonar, S.A. 1998. Recent activities in warmwater fisheries research at the Washington Department of Fish and Wildlife. *Washington State B.A.S.S. Federation Newsletter 8(4):13.*** Reported recent progress on inland fisheries research projects such as: warmwater-salmon interactions, development of warmwater fish community survey protocols, and use of artificial structure to enhance warmwater fisheries in Washington lakes.
2. **Bonar, S.A. 1998. New research on interactions between warmwater fish and salmon in Washington State. *Washington State B.A.S.S. Federation Newsletter 8(1):10.*** Describes a new project at the WDFW examining interactions between warmwater fish and salmon in various Washington watersheds.
3. **Bonar, S.A. 1997. New warmwater fisheries research in Washington State. *Washington State B.A.S.S. Federation Newsletter 7(2):12.*** Reported new warmwater fisheries research projects at the WDFW including: warmwater-salmon interactions, development of warmwater fish community survey protocols, and use of artificial structure to enhance warmwater fisheries in Washington lakes.
4. **Bonar, S.A. 1997. Washington Department of Fish and Wildlife reports results of grass carp study. *Waterline. February/March/April: 4.*** Describes results of a statewide inland fisheries research study investigating grass carp impacts in 100 Washington lakes and associated lakefront property owner satisfaction.

5. **Bonar, S.A. 1996. Why use rotenone in Washington lakes? *Waterline*. May/June/July: 6.** Reports how and why rotenone is used to manage fish populations in Washington.
6. **Bonar, S.A. 1994. Illegal stocking of fish in Washington lakes. *Washington State B.A.S.S. Federation Newsletter*. 4(2):14-15.** Describes the dangers and penalties associated with illegally stocking fish.
7. **Bonar, S.A. 1994. Personal fish stocking is illegal. *Waterline*. May/June: 4.** Describes the dangers and penalties associated with illegally stocking fish.
8. **Bonar, S.A. 1994. How do aquatic plants affect warmwater fishing? *Washington State B.A.S.S. Federation Newsletter* 4(4):12-13.** Describes the role of aquatic plants in structuring a warmwater fish community.
9. **Bonar, S.A. 1994. All you ever wanted to know about rotenone but were afraid to ask. *Washington State B.A.S.S. Federation Newsletter* 4(1):2,5.** Reports how and why rotenone is used to manage fish populations in Washington.
10. **Bonar, S.A. 1994. Anglers can help balance warmwater fish communities. *Waterline*, April.** Describes how fishing pressure can impact structure of warmwater fish communities.
11. **Bonar, S.A. 1993. Warmwater fish community balance and the Washington bass angler. *Washington State B.A.S.S. Federation Newsletter* (3)4 :14.** Discusses the feeding ecology of largemouth bass in Washington lakes and how anglers can use this information.
12. **Bonar, S.A. and D. Fletcher. 1993. Chapters in Review: Washington. Improving angling and water clarity through predator manipulation. *LakeLine* 13(4):48.** Describes a predator manipulation study near Yakima, Washington where Inland Research investigated the use of cascading trophic dynamics for algae control.

## (16) INVENTIONS, PATENTS HELD

I designed a computerized water temperature 36 tank aquarium system with my students to test the effects of static and fluctuating water temperatures on Southwestern fishes. This system was built and reported in *Aquaculture Engineering* (see Widmer et al. 2006). As part of this system we invented a hot and cold-water temperature-boosting device using an air-conditioning compressor, titanium piping, and HVAC equipment. We hope to apply for a patent on the device.

## **(17) HONORS, AWARDS, RECOGNITION, ELECTED MEMBERSHIPS**

- U.S. Fish and Wildlife Service Award of Appreciation, Pacific Southwest Region, for supporting the mission of the U.S. Fish and Wildlife Service with research on Devils Hole pupfish and commissioning of the Ash Meadows Fish Conservation Facility. (June 27, 2013).
- Stephani Clark, University of Arizona Graduate and Professional Student Council Travel Grant, Scott Bonar Student (June 3, 2013)
- Jack Ruggirello, University of Arizona Graduate and Professional Student Council Travel Grant, Scott Bonar Student (June 3, 2013)
- Sally Petre, AFS Skinner Award, Scott Bonar Student (Given to only a few MS students across entire United States to provide for attendance at Annual AFS Meeting; July 5, 2013).
- Sally Petre, AFS Western Division Eugene Maughan Scholarship, Scott Bonar Student (Given to one MS student across entire western United States; March 19<sup>th</sup>, 2013).
- Sally Petre, AFS Western Division Travel Grant, Scott Bonar Student. (March 3, 2013)
- Jack Ruggirello, University of Arizona Graduate and Professional Student Council Travel Grant, Scott Bonar Student (June 3, 2013)
- USGS STAR Award, USGS (December 20, 2012)
- Ambre Chaudoin, Best Student Paper AZ/NM AFS, Scott Bonar Student, AZ/NM Annual AFS Meeting (February 5, 2012)
- Joy Price, Best Student Paper AZ/NM AFS, Scott Bonar Student, AZ/NM Chapter of the American Fisheries Society (February 5, 2011)
- USGS STAR Award, USGS (December 20, 2010)
- American Fisheries Society Certificate of Appreciation, American Fisheries Society (April 21, 2010)
- Arizona Game and Fish Department Mentor of the Year, Arizona Game and Fish Department (January 15, 2010)
- STAR Award, USGS Cooperative Units Program (October 1, 2008)

- The Wildlife Society Nominee, Best Book of Year, Wildlife Society (October 1, 2008)
- Arizona Cooperative Fish and Wildlife Research Unit Award for Best Science – USGS Cooperative Units Program, 2007.
- STAR Award, U.S. Department of the Interior, 2007.
- Anne Kretschmann, a Masters student of Dr. Bonar received Best Student Poster Award at the Arizona/New Mexico American Fisheries Society Annual Meeting. 2007.
- STAR Award, U.S. Department of the Interior, 2006.
- Jason Kline, Best Student Paper (Hubbs Award) Desert Fishes Council Annual Meeting (Bonar Student), 2006.
- Jason Kline, a Masters student of Dr. Bonar, received Best Student Paper at the Arizona/Nevada Academy of Science Annual Meeting, 2006.
- Scott Bonar and Yuliya Kuzmenko, Invited to address the Environmental Security Council, North Atlantic Treaty Organization (NATO), Brussels, Belgium on joint research between scientists of the United States and the former Soviet Union, 2006.
- The Arizona Cooperative Fish and Wildlife Research Unit received the Cooperative Research Unit Excellence in Cooperator Support Award for excellence in furthering the mission of the Cooperative Research Units Program, 2005.
- Andrew Schultz, a Ph.D. student of Dr. Bonar received Best Student Paper Award at the Arizona/New Mexico American Fisheries Society Annual Meeting. 2004.
- STAR Award, U.S. Department of the Interior, 2003.
- STAR Award, U.S. Department of the Interior, 2001.
- David Ward, an MS student of Dr. Bonar received Best Student Paper Award at the Arizona/ New Mexico American Fisheries Society Chapter Meeting. 2001.
- STAR Award, U.S. Department of the Interior, 2000.
- Five and ten-year service awards from the Washington State Department of Fish and Wildlife. 1995, 2000.
- Appreciation Award from Washington Department of Fish and Wildlife Region 5. For service and dedication to the Inland Fisheries Program. 2000.

- Elected by American Fisheries Society to co-author, with four other scientists, a survey protocol for bull trout populations in North America. 1999.
- Washington State Nominee, U.S. Fish and Wildlife Service Division of Federal Aid Media Outreach Project. The project “Relationships between stocked trout density and the occurrence and abundance of amphibians at Washington high mountain lakes” was nominated for national/regional media coverage, 1998.
- Washington State Nominee, U.S. Fish and Wildlife Service Division of Federal Aid Media Outreach Project. The project “Interactions between warmwater fish and native aquatic species in Washington State” was nominated for national/regional media coverage, 1998.
- Cooperative Fish and Wildlife Research Unit, University of Washington, Unit Leaders' Outstanding Student Award \$1,000, 1991.

### **Graduate**

- School of Fisheries Cobb Scholarship \$1,000, 1989.
- 1st place, Student paper competition at the North Pacific International Chapter Meeting of the American Fisheries Society. March 7-8, 1989.
- School of Fisheries Geil Scholarship \$500, 1988.
- School of Fisheries Thompson Scholarship \$500, 1987.
- 3rd place, Student paper competition at the Aquatic Plant Management Society Meeting. July 21-24, 1985.
- 1st place, Student paper competition at the North Pacific International Chapter Meeting of American Fisheries Society. March 25-27, 1985.
- School of Fisheries Thompson Scholarship \$1,000, 1985.
- School of Fisheries Geil Scholarship \$500, 1984.
- School of Fisheries Egtvedt Trust \$3,600 and in-state tuition, 1984.



## (18) BIBLIOGRAPHY

### a. PUBLISHED REPORTS

1. **Recsetar, M. S. and Scott A. Bonar. 2013. Survival of Apache trout eggs and alevins under static and fluctuating temperature regimes. *Transactions of the American Fisheries Society* 142:373-379.** Concept and design of study (40%), Data production (40%), Interpretation (40%), Writing (40%).
2. **Rogowski, D. L., S. Sitko, and S. A. Bonar. 2013. Optimizing control of invasive crayfish using life-history information. *Freshwater Biology* 58:1279-1291.** Concept and design of study (30%), Data production (20%), Interpretation (20%), Writing (20%).
3. **Recsetar, M.S. and S.A. Bonar. 2013. Effectiveness of two commercial rotenone formulations on the eradication of virile crayfish *Orconectes virilis*. *USGS Arizona Cooperative Fish and Wildlife Research Unit Fisheries Research Report 01-13*.** Reports effectiveness of rotenone in controlling invasive crayfish. Concept and design of study (40%), Data production (30%), Interpretation (40%), Writing (40%).
4. **Recsetar, M.S., M.P. Zeigler, D.L. Ward, S.A. Bonar, and C.A. Caldwell. 2012. Relationship between fish size and thermal tolerance. *Transactions of the American Fisheries Society* 141:1433-1438.** Investigates how upper temperature tolerance may vary by fish size for six freshwater fish species. Concept and design of study (30%), Data production (20%), Interpretation (30%), Writing (30%).
5. **Iles, A., T P. Archdeacon, and S.A. Bonar. 2012. Novel praziquantel treatment regime for controlling Asian tapeworm infections in pond-reared fishes. *North American Journal of Aquaculture* 74:113-117.** Asian tapeworm is an exotic parasite accidentally brought into the United States. Its range is expanding and this work discusses new treatment methods to remove this parasite from pond-reared fishes. Concept and design of study (20%), Data production (20%), Interpretation (20%), Writing (30%).
6. **Bonar, S.A., A.A. Schultz, and E.A. Sontz. 2011. Captive breeding and culture of Gila chub *Gila intermedia*, Headwater chub *Gila nigra* and roundtail chub *Gila robusta*. *USGS Arizona Cooperative Fish and Wildlife Research Unit Fisheries Research Report 01-11*.** Reports results of captive propagation studies for two listed and one non-listed native desert fishes. Concept and design of study (20%), Data production (20%), Interpretation (20%), Writing (20%).

7. **Bonar, S.A., J.S. Fehmi, and N. Mercado-Silva. 2011. An overview of sampling issues in species diversity and abundance surveys. Pages 11-24 in A. Magurran and B. McGill, editors, *Biological Diversity: Frontiers in Measurement and Assessment*. Oxford University Press, New York.** Concept and design of study (40%), Data production (10%), Interpretation (30%), Writing (40%).
8. **Bonar, S.A. and W.J. Matter. 2011. Cumulative effects on freshwater fishes. In P. R. Krausman and L. Harris, editors. *Cumulative effects in wildlife management*. CRC Press, Boca Raton, Florida.** Concept and design of study (80%), Data production (20%), Interpretation (80%), Writing (80%).
9. **Archdeacon, T.P., A. Iles, J. Kline, and S.A. Bonar. 2010. Asian fish tapeworm *Bothriocephalus acheilognathi* in the desert southwestern United States. *Journal of Aquatic Animal Health* 22:274–279.** Describes Asian tapeworm movement across the southwestern United States. Concept and design of study (30%), Data production (20%), Interpretation (20%), Writing (20%).
10. **Bonar, S.A., N. Mercado-Silva, and D. Rogowski. 2010. Habitat use by the fishes of a southwestern desert stream: Cherry Creek, Arizona. Research Report. USGS Arizona Cooperative Fish and Wildlife Research Unit Report, University of Arizona.** Reports results of study developing habitat suitability indices for desert fishes. Used in litigation by U.S. Forest Service to protect instream flows for native desert fishes from surface mining. Concept and design of study (40%), Data production (20%), Interpretation (30%), Writing (30%).
11. **Kuzmenko, Y., T. Spesiviy, and S.A. Bonar. 2010. Mechanical suppression of northern pike (*Esox lucius*) populations in small Arizona reservoirs. USGS Arizona Cooperative Fish and Wildlife Unit Fisheries Research Report 01-10.** Describes use of Ukrainian and U.S. methods to control nuisance northern pike. Concept and design of study (40%), Data production (20%), Interpretation (30%), Writing (30%).
12. **Bonar, S.A. and M. Fraidenburg. 2010. Communications in fisheries. In W. A. Hubert and M. Quist, Editors. *Inland Fisheries Management in North America*. 3rd Edition. American Fisheries Society, Bethesda, Maryland.** Overview of communication techniques useful for fisheries scientists. Concept and design of study (50%), Data production (10%), Interpretation (30%), Writing (50%).
13. **Archdeacon, T.P. and S.A. Bonar. 2010. Intraspecific predation in endangered Mohave tui chub. *California Fish and Game* 96(3):213-215.** Discusses feeding behavior of the highly endangered Mohave tui chub and implications for management. Concept and design of study (10%), Data production (10%), Interpretation (30%), Writing (20%).

14. **Bonar, S.A., W.A. Hubert, and D.W. Willis. 2009. *Standard Methods for Sampling North American Freshwater Fishes*. American Fisheries Society, Bethesda, Maryland. 459 pp.** First text of continent-wide standard freshwater fish sampling methods in the history of fisheries science. Now used for fisheries standard sampling procedures for various states and provinces. Concept and design of study (50%), Data production (20%), Interpretation (20%), Writing (20%).
  
15. **кузьменко, ю. г., т. в. спесивый, с.а. боннар. 2009. морфологическая характеристика и рост щуки (*Esox lucius L.*) некоторых водоемов сша. рибне господарство міжвідомчий тематичний науковий збірник випуск 67:131-135. (Kuzmenko, Y.G., T.V. Specivy, and S.A. Bonar. 2009. *Morphological characteristics and growth of northern pike in waters of the United States. Fisheries (Ukrainian Academy of Agrarian Sciences) 67:131-135.*** Compares northern pike populations in the United States with those in Dneiper River system, Ukraine and discusses management implications. Concept and design of study (25%), Data production (20%), Interpretation (25%), Writing (0%).
  
16. **Archdeacon, T.P. and S.A. Bonar. 2009. Captive breeding of endangered Mohave tui chub. *North American Journal of Aquaculture 71:360-362.*** Discusses methods to captively-breed for the first time one of the most highly endangered fishes in North America. Concept and design of study (30%), Data production (20%), Interpretation (30%), Writing (30%).
  
17. **Kline, S.J., T.P. Archdeacon, and S.A. Bonar. 2009. Effects of praziquantel on eggs of the Asian tapeworm *Bothriocephalus acheilognathi*. *North American Journal of Aquaculture 71:380-383.*** Shows treatments currently used for eliminating Asian tapeworm in fish may leave viable eggs to be transported to other water bodies. Concept and design of study (30%), Data production (20%), Interpretation (30%), Writing (35%).
  
18. **Bonar, S.A., S. Contreras-Balderas, and A.C. Iles. 2009. An introduction to standardized sampling. In S. A. Bonar, W. A. Hubert, and D. W. Willis, Editors. *Standard Methods for Sampling North American Freshwater Fishes*. American Fisheries Society, Bethesda, Maryland.** Introduces the concept of standardization and discusses its importance in fisheries management. Concept and design of study (70%), Data production (10%), Interpretation (30%), Writing (70%).

19. **Brouder, M., A.C. Iles, and S.A. Bonar. 2009. North American averages of length frequency, condition, growth, and catch per effort. In S. A. Bonar, W. A. Hubert, and D. W. Willis, Editors. *Standard Methods for Sampling North American Freshwater Fishes*. American Fisheries Society, Bethesda, Maryland.** Provides comparative condition, length-frequency, catch per effort, and growth summaries by water body type and sampling method for 15 common fish species from analysis of over 4000 data sets from across North America. Concept and design of study (70%), Data production (20%), Interpretation (30%), Writing (30%).
20. **Bonar, S.A. 2009. Book review: Burbot: Ecology, management, and culture. V.L. Paragamian and D.H. Bennett, eds. *The Quarterly Review of Biology* 84: 210-211** Review of recent book on burbot. Concept and design of study (100%), Data production (0%), Interpretation (30%), Writing (100%).
21. **Bonar, S.A., W.A. Hubert, and D.W. Willis. 2009. The North American freshwater fish standard sampling project: Improving fisheries communications. *Fisheries* 34:340-344.** Overview of the North American standard sampling project. Concept and design of study (70%), Data production (20%), Interpretation (30%), Writing (70%).
22. **Kline, S.J. and S.A. Bonar. 2009. Captive breeding of Yaqui topminnow and Yaqui chub. *North American Journal of Aquaculture* 71:73-78.** Describes captive-breeding techniques developed for two highly endangered fish species. Concept and design of study (30%), Data production (20%), Interpretation (30%), Writing (30%).
23. **Kubecka, J., U.S. Amarasinghe, S.A. Bonar, J. Hateley, P. Hickley, E. Hohausova, J. Matena, J. Peterka, P. Suuronen, V. Tereschenko, R. Welcomme, and I.J. Winfield. 2009. The true picture of a lake or reservoir fish stock: a review of needs and progress. *Fisheries Research* 96: 1-5.** Overview of progress in lake and reservoirs fish stock assessment reported in an international conference. Concept and design of study (10%), Data production (10%), Interpretation (10%), Writing (10%).
24. **Schultz, A.A. and S.A. Bonar. 2009. Growth and survival of larval and juvenile Gila chub at different temperatures. *North American Journal of Aquaculture* 71:1-5.** Growth and survival of endangered Gila chub by water temperature. Implications for climate change management and captive breeding. Concept and design of study (30%), Data production (20%), Interpretation (30%), Writing (25%).

25. Rogowski, D.L., S. Sitko, and S.A. Bonar. 2009. **Optimizing northern crayfish (*Orconectes virilis*) control methods in Arizona streams.** *USGS Arizona Cooperative Fish and Wildlife Unit Fisheries Research Report 2-09*. Through field studies and models shows how trapping and other non-native crayfish control methods can be optimized for southwestern streams. Concept and design of study (35%), Data production (20%), Interpretation (30%), Writing (30%).
26. Kuzmenko, Y., T. Spesivy, and S.A. Bonar. 2008. **Comparative analyses of northern pike (*Esox lucius* L.) growth rates from reservoirs of Ukraine and USA.** *Сучасні Проблеми Теоретичної Та Практичної Іхтіології. Канів, 2008:91-92*. Examines morphology of Northern Pike in Ukrainian reservoirs versus that in U.S. waters. Concept and design of study (30%), Data production (20%), Interpretation (25%), Writing (0%).
27. Flinders, J.M. and S.A. Bonar 2008. **Growth, condition, diet, and consumption rates of northern pike in three Arizona reservoirs.** *Lake and Reservoir Management 24:99-111*. Describes biology and management implications of introduced northern pike in Arizona reservoirs. Concept and design of study (30%), Data production (20%), Interpretation (30%), Writing (30%).

**--Date of Last Promotion--**

28. Archdeacon, T.P., S.A. Bonar, S.J. Kline, A.C. Iles, and D. Hughson. 2008. Effects of Asian Tapeworm on the Endangered Mohave Tui Chub. *Arizona Cooperative Fish and Wildlife Research Unit Fisheries Research Report 02-08*.
29. Bonar, S.A. 2007. *The conservation professional's guide to working with people*. Island Press, Washington D.C. 208 pp.
30. Carveth, C.J., A. M. Widmer, S.A. Bonar, and J. R. Simms. 2007. An examination of the effects of chronic static and fluctuating temperature on the growth and survival of spinedace, *Meda fulgida*, with implications for management. *Journal of Thermal Biology 32:102-108*.
31. DuBey, R., S. Schrader, C. Caldwell, D. L. Winkleman, P. Budy, and S.A. Bonar. 2007. Southwest regional risk assessment for whirling disease in native salmonids: Data assembly and conceptual model development. Pages 47-48 *In Proceedings of the 13<sup>th</sup> Annual Whirling Disease Symposium "Resistance on Two Fronts"*. Denver, Colorado, February 12-13, 2007.
32. Kline, S.J., T.P. Archdeacon, A.C. Iles, and S.A. Bonar. 2007. Factors influencing distribution of introduced Asian tapeworm and effects on selected Southwestern fishes (Yaqui topminnow and Yaqui chub). *Arizona Cooperative Fish and Wildlife Unit Fisheries Research Report 01-07*.

33. Schultz, A.A. and S.A. Bonar. 2007. Spawning and culture of Gila chub. *Arizona Cooperative Fish and Wildlife Unit Fisheries Research Report 02-07*.
34. Carveth, C.J., A.M. Widmer, and S.A. Bonar. 2006. Comparison of upper thermal tolerances of native and nonnative fish species in Arizona. *Transactions of the American Fisheries Society* 135:1433-1440.
35. Choudhury, A., E. Charipar, P. Nelson, J. R. Hodgson, S.A. Bonar, and R.A. Cole. 2006. Update on the distribution of the invasive Asian fish tapeworm, *Bothriocephalus acheilognathi*, in the US and Canada. *Comparative Parasitology* 73(2): 269-273.
36. Schultz, A.A. and S.A. Bonar. 2006. Selected aspects of the natural history of Gila chub. *Arizona Cooperative Fish and Wildlife Unit Fisheries Research Report 02-06*.
37. Widmer, A.M., C.J. Carveth, J.W. Keffler, and S.A. Bonar. 2006. Design of a computerized, temperature-controlled, recirculating aquarium system. *Aquacultural Engineering* 35(2):152-160.
38. Widmer, A.M., C.J. Carveth, S.A. Bonar, and J.R. Simms. 2006. Upper temperature tolerance of loach minnow under acute, chronic, and fluctuating thermal regimes. *Transactions of the American Fisheries Society* 135:755-762.
39. Bonar, S.A., B.D. Bolding, M. Divens, and W. Meyer. 2005. Effects of introduced fishes on wild juvenile coho salmon using three shallow Pacific Northwest lakes. *Transactions of the American Fisheries Society*. 134(3)641-652.
40. Bonar, S.A., C.J. Carveth, A.M. Widmer, and J. Simms. 2005. Upper temperature tolerance of loach minnow and spikedace under acute, chronic, and fluctuating thermal regimes. *Arizona Cooperative Fish and Wildlife Unit Fisheries Research Report 04-05*.
41. Schade, C.B. and S.A. Bonar. 2005. Distribution and abundance of nonnative fishes in streams of the western United States. *North American Journal of Fisheries Management* 25:1386-1394.
42. Widmer, A.M., C.J. Carveth, and S.A. Bonar. 2005. Transport and care of small desert fishes. *Arizona Cooperative Fish and Wildlife Research Unit Fisheries Research Report 03-05*.
43. Bolding, B., S.A. Bonar, and M. Divens. 2004. Use of artificial structure to enhance angler benefits in lakes, ponds, and reservoirs: A literature review. *Reviews in Fisheries Science* 12:75-96.

44. Bonar, S.A. 2004. The basics of sampling fish in lakes and ponds. *Lakeline* 24(1):22-26.
45. Bonar, S.A., L.L. Leslie, and C.E. Velez. 2004. Influence of species, size class, environment, and season on introduced fish predation on native fishes in the Verde River System, Arizona. *Arizona Cooperative Fish and Wildlife Research Unit Research Report* 01-04.
46. Didenko, A.V. and S.A. Bonar. 2004. Standard weight (Ws) equations for four rare desert fishes. *North American Journal of Fisheries Management* 24:697-703.
47. Flinders, J.M. and S.A. Bonar. 2004. Biology and foraging demands of northern pike in three Arizona reservoirs and their distribution and status in the southwestern United States. *Arizona Cooperative Fish and Wildlife Research Unit Fisheries Research Report* 03-04.
48. Leslie, L.L., C.E. Velez, and S.A. Bonar. 2004. Utilizing volunteers on fisheries projects: Benefits, challenges, and management techniques. *Fisheries* 29(10):10-14.
49. Schade, C.B. and S.A. Bonar 2004. Factors associated with the distribution and abundance of non-native fishes in streams of the American west. *Arizona Cooperative Fish and Wildlife Research Unit Fisheries Research Report* 02-04.
50. Schultz, A.A. and S.A. Bonar. 2004. Selected aspects of the natural history of Gila chub. 2002-2004 progress report. Arizona Cooperative Fish and Wildlife Research Unit Fisheries Research Report 04-04.
51. Schultz, A., E. Maughan, W. Matter, and S.A. Bonar. 2003. Effects of Flooding on Abundance of Native and Nonnative Fishes Downstream From a Small Impoundment. *North American Journal of Fisheries Management* 23:503-511.
52. Ward, D.L and S.A. Bonar. 2003. Effects of cold water on susceptibility of age 0 flannelmouth sucker to predation by rainbow trout. *The Southwestern Naturalist*. 48(1):43-46.
53. Bonar, S.A., J. Flinders, O.E. Maughan, and W.J. Matter. 2002. Factors associated with razorback sucker recruitment in a small southern Arizona pond. *Arizona Cooperative Fish and Wildlife Research Unit Fisheries Research Report* 01-02.
54. Bonar, S.A. and W.A. Hubert. 2002. Standard sampling of inland fish: benefits, challenges, and a call for action. *Fisheries* 27(3):10-16.
55. Bonar, S.A. 2002. Relative length frequency: A simple, visual technique to evaluate size structure of fish populations. *North American Journal of Fisheries Management* 22:1086-1094.

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57. Peterson, J., J. Dunham, P. Howell, R. Thurow, and S.A. Bonar. 2002. Protocol for Determining Bull Trout Presence. *American Fisheries Society Bull Trout Committee Special Publication*.
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59. Ward, D.L., O.E. Maughan, and S.A. Bonar. 2002. A variable speed swim tunnel for testing the swimming ability of age 0 fish. *North American Journal of Aquaculture* 64:228-231.
60. Bolding, B., S.A. Bonar, and M. Divens. 2001. Use of artificial structure to enhance freshwater sportfish communities in lake, ponds and reservoirs: a literature review. Washington Department of Fish and Wildlife Science Division, Technical Report Number: FPT01-06.
61. Bonar, S.A., L.G. Brown, P.E. Mongillo, and K. Williams. 2000. Biology, distribution and management of burbot *lota lota* in Washington State. *Northwest Science* 74:87-96.
62. Buckley, R., B. Bolding, and S.A. Bonar. Inland Fisheries Research D.J. Report, FY 1999-2000. *Washington Department of Fish and Wildlife Technical Report*.
63. Divens, M., S.A. Bonar, and B. Pfeifer. 2000. Trout stocking in high lakes: Reported impacts and implications for Washington State. *Washington Department of Fish and Wildlife Research Report*.
64. Bonar, S.A., B. Bolding, and M. Divens. 2000. Sampling Guidelines for Washington State Standardized Pond and Lake Surveys. *Washington Department of Fish and Wildlife Research Report*. 38 pp.
65. Bonar, S.A., B. Bolding, and M. Divens. 1999. Management of aquatic plants in Washington State using triploid grass carp. In ODFW and NMFS. 1999. *Management Implications of Co-occurring Native and Introduced Fishes: Proceedings of the Workshop. October 27-28, 1998, Portland, Oregon*. 243 pgs.



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67. Loch, J.J. and S.A. Bonar. 1999. Occurrence of grass carp in the lower Columbia and Snake rivers. *Transactions of the American Fisheries Society* 128:374-379.
68. Bolding, B., S.A. Bonar, and M. Divens. 1998. Walleye diet in a shallow impoundment: relative importance of pumpkinseed sunfish and yellow perch. *Journal of Freshwater Ecology* 13:9-14..
69. Bonar, S.A., G.B. Pauley, and G.L. Thomas. 1998. Effects of triploid grass carp (*Ctenopharyngodon idella*) grazing on the aquatic macrophytes in Big Chambers Lake and Little Chambers Lake. In G.B. Pauley and seven coauthors eds. *The Biology and Effects of Triploid Grass Carp (Ctenopharyngodon idella) on the Plant Community, Fish Assemblage and Water Quality of Big Chambers Lake and Little Chambers Lake, Washington.* Technical report. Washington Cooperative Fishery Research Unit. Chapter 1:1-35.
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72. Pauley, G.B., S.A. Bonar, K.L. Bowers, and G.L. Thomas. 1998. Triploid grass carp (*Ctenopharyngodon idella*) feeding preferences for aquatic macrophyte species from Big Chambers Lake and two other Pacific Northwest lakes. In G.B. Pauley and seven coauthors eds. *The Biology and Effects of Triploid Grass Carp (Ctenopharyngodon idella) on the Plant Community, Fish Assemblage and Water Quality of Big Chambers Lake and Little Chambers Lake, Washington.* Technical Report. Washington Cooperative Fishery Research Unit. Chapter 4:1-52.

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74. Veicht, S.A., G.B. Pauley, S.A. Bonar, and G.L. Thomas. 1998. Growth rates of triploid grass carp (*Ctenopharyngodon idella*) in Big Chambers Lake and three other Washington State lakes. In G.B. Pauley and seven coauthors eds. The Biology and Effects of Triploid Grass Carp (*Ctenopharyngodon idella*) on the Plant Community, Fish Assemblage and Water Quality of Big Chambers Lake and Little Chambers Lake, Washington. Technical report. Washington Cooperative Fishery Research Unit. Chapter 5:1-57.
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#### **b. REPORTS ACCEPTED FOR PUBLICATION**

1. **Zeigler, M. P., S. F. Brinkman, C. A. Caldwell, A. S. Todd, M. S. Recsetar, and S. A. Bonar. In Press. Upper thermal tolerances of Rio Grande cutthroat trout under constant and fluctuating temperatures. Transactions of the American Fisheries Society.** Concept and design of study (20%), Data production (5%), Interpretation (5%), Writing (5%).

Four other articles/reports undergoing FSP approval and being submitted to journals.  
Nine other articles currently in preparation.

#### **19. PUBLICATIONS – three most significant scientific impact**

**Bonar, S.A., W.A. Hubert, and D.W. Willis. 2009. *Standard Methods for Sampling North American Freshwater Fishes*. American Fisheries Society, Bethesda, Maryland.**

This is the first text of continent-wide standard freshwater fish sampling procedures in the history of fisheries science. I am lead editor of this book (and author of two chapters) and chair the Standard Sampling Committee, Fisheries Management Section, American Fisheries Society. I obtained funding and cooperation from ten federal, state and private agencies to fund the project and coordinated the work of two coeditors and 284 authors, reviewers and sponsors from 107 agencies, universities, private industry and organizations from across Canada, Mexico and the United States. *Standard Methods for Sampling North American Freshwater Fishes* describes standard methods and gear types to sample fish in specific environments so population indices can be more easily compared across regions and time. Environments include ponds, reservoirs, natural lakes, streams and rivers containing cold and warmwater fishes. This book also provides other information necessary for standard sampling programs such as tables of comparison data averaged from over 4000 data sets from 43 states and provinces; methods to convert nonstandard to standard data; statistical and database procedures for standard sampling, methods to calibrate electrofishing gear, and methods to prevent transfer of invasive species while sampling. Development of standard sampling methods across North America has been of interest since the 1980's or earlier. However, development was not completed earlier because of disagreements among scientists and managers as to best methods. I used social research reported in *Conservation Professional's Guide to Working With People* to help arrive at consensus and complete this project successfully.

Furthermore, this book led to development of **Bonar, S. A., M. Rahr, T. Torrey, A. Cate Jr., and N. Mercado Silva. 2012. <http://fisheriesstandardsampling.org> A simple web based tool to compare standard inland fish data. Version 1. American Fisheries Society.** Just as physicians need computer-generated reports to compare cholesterol, blood pressure and body temperature to human population means and percentiles when diagnosing illness in a patient; fisheries professionals need the same when diagnosing problems in fish communities. This website/analysis tool is companion to *Standard Methods*, and required considerable effort to construct; received as much – or more – review than a publication. I led team of three programmers to develop this web-based tool to analyze standard fish data with a simple click of a button. This was a collaborative project among AFS, two Universities and three agencies, and was also constructed since the last promotion. <http://fisheriesstandardsampling.org> (1) allows users to quickly compare condition, growth and abundance of fish collected in a particular water body with rangewide, ecoregion and state averages and percentiles based on thousands of data sets collected across North America; (2) allows easy entry of new standardized data, enabling crowd sourcing to constantly update and improve summaries similar to Wikipedia. The site is programmed in a Drupal framework, involving PHP and MySQL. How it works is as follows: The user selects what water body type and standard AFS fisheries survey type they used, they next upload a spreadsheet with fish length/weight/growth data; they click on a Google map the location (water body) where they collected the data; they click a button and the data from fish in their water body is automatically compared to state, region, and rangewide summaries. Graphical output and raw data is provided to the user.

#### Impact:

- First continental effort to standardize freshwater fisheries sampling in the history of fisheries science.
- Methods generally accepted by the fisheries community at large.
- Book of methods consistently in the top 1-4 bestsellers of the American Fisheries Society since publication in 2009.
- Methods being adopted by numerous state, provincial and federal agencies across North America.
- Work subject of three international fisheries symposiums: AFS Annual Meetings in Ontario, Minnesota; World Fisheries Congress, Edinburgh Scotland, U.K. Standing room only in last year's AFS symposium in St. Paul.
- I was invited to give Keynote addresses at two international fisheries sampling meetings in the Czech Republic, and address The European Committee for Standardization (CEN) in London, consisting of fisheries biologists from countries across Europe to inform of the contents of this book.
- Methods now subject of considerable research by others – validation, calibration studies, computer intensive techniques.
- Meeting at World Fisheries Congress, Edinburgh, Scotland held to investigate potential for international standardization.

- Unanimous vote from AFS Fisheries Management Section to increase international scope of standardization, and interest from a variety of European countries to collaborate. Collaboration outside North America currently underway.
- <http://fisheriesstandardsampling.org> was invited for demonstration at AFS Annual Meetings in St. Paul and Seattle; and at workshops and symposia at various AFS Division Meetings (Wichita, Nashville). Continuing education course on the program being offered at the 2013 Annual AFS Meeting in Little Rock, Arkansas.
- All fisheries biologists from some state agencies were required by management to attend workshops on website.
- Website demonstrations were allowed at the main table of AFS Publications throughout the entire trade show at the 2012 Annual AFS meeting in St. Paul, MN.

**Carveth, C.J., A.M. Widmer, and S.A. Bonar. 2006. Comparison of upper thermal tolerances of native and nonnative fish species in Arizona. *Transactions of the American Fisheries Society* 135:1433-1440.**

This is one of a series of articles, authored by my students/staff and me, that quantifies habitat requirements of desert fishes. Habitat requirements of critically endangered desert fishes are less known than those of fishes in other areas – and information on these requirements are needed now more than ever. Of the 150 full species included in the fish fauna of the West, as of 1990, 122 taxa west of Rocky Mountains have disappeared, or were listed as threatened or endangered. Although some of these taxa represent subspecies, not full species, the reduction in their numbers remains considerable. Previously, temperature tolerances of most desert fishes were thought to be higher than those of commonly-introduced species. Here we found that many desert fishes have upper temperature tolerances equal, or lower than nonnative fishes commonly introduced to desert ecosystems. This work has been especially important to climate change biologists to predict effects of increasing stream temperatures on native-nonnative fish interactions. It has also led to a variety of projects examining the habitat needs – especially temperature tolerances – of fishes of arid lands. These projects have been important for climate change managers and those protecting streams from mining activities, border operations, and urbanization.

Impact:

- Research results being used by state and federal agencies to develop temperature criteria for streams.
- Was a top-ten viewed article in AFS journals.
- Led to a series of research projects conducted with my students/staff on desert fish habitat requirements.
- This article and others in our laboratory quantified temperature tolerance/increasing water temperatures on 19 fishes of the Southwest.

- Article and associated research used to develop habitat suitability criteria for desert fishes to support USFS, Department of Justice and BLM litigation to protect water rights of stream fishes from excess water pumping and mining activity. According to the U.S. Department of Justice Attorneys, protection of water rights of native species in these streams will have landmark consequences on stream management across the nation.
- Article and associated research led to research testing effects of US/Mexico Border Operations on T&E fish habitat in streams crossing the US/Mexico border.
- Article led to research to investigate methods to cool streams through habitat alteration.
- Led to stream cooling investigations used by AZGFD, USFWS, and USFS to conserve Apache trout habitat.

**Bonar, S. A., B. D. Bolding, M. Divens, and W. Meyer. 2005. Effects of introduced fishes on wild juvenile coho salmon using three shallow Pacific Northwest lakes. *Transactions of the American Fisheries Society*. 134(3)641-652.**

Declines in Pacific salmon stocks have been blamed on hydropower, overfishing, ocean conditions and land-use practices; however, less is known about the impacts of nonnative fish. I was the principal investigator on a project examining impacts of predation and competition of common introduced fish species on wild coho salmon in shallow western Washington lakes. Largemouth bass were responsible for an average of 98% of the predation on coho salmon in all lakes. The proportion of smolt equivalents eaten by largemouth bass varied substantially among lakes and years, ranging from 4% to 293% of those exiting the system. Food competition with introduced fishes did not limit growth or food consumption of juvenile coho salmon rearing in lakes. Lowland lakes are important rearing areas and migration corridors for juvenile coho salmon. Anadromous salmonids have access to over 450 lakes and ponds in Western Washington alone. Largemouth bass are found in > 75% of the lowland warmwater lakes in Washington, Oregon, and the eight most northwestern counties of California. This research showed that predation by largemouth bass could be an important factor affecting juvenile coho salmon survival in these systems.

Impact:

- Several PNW biologists informed me that this work is being used heavily and causing much discussion in the Pacific Northwest (Dr. Pete Bisson, USFS and salmonid expert and others; personal communication).
- One of the top ten articles viewed in any AFS journal when it was published.
- Research being used by U.S. Fish and Wildlife Service, Canadian Government Biologists, and State Agency biologists to manage lakes across the Pacific Northwest used by anadromous salmon.
- Research was communicated to users by meetings with agency biologists, and at two national (AFS) conferences.

- Methods reported in this publication used to examine predation by introduced fishes in desert stream systems and lakes. (Bonar et al. 2004). These results used by management agencies in the southwestern United States.

## (20) POSITION DESCRIPTION

Attached please find a copy of the current position description.

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Scott A. Bonar

### Privacy Act Notice:

Pursuant to Section 3(e)(3) of the Privacy Act of 1974 (Public Law 93-573), the individual furnishing information on this form is hereby advised as follows: 1. the authority for solicitation of the information is 5 USC 552(a). 2. The principal purpose for which the information is intended to be used is for the U.S. Geological Survey research and development peer panel review process. 3. The routine disclosure of the information is to scientific, management and administrative staff who are participants in the peer review process or who are in the human resources office. 4. The effect on the individual of not providing all or any part of the requested information is not having an up-to-date Research and Development Scientific Record for peer review thereby resulting in a delayed or no peer review. 5. This record and information in this record may be used by the Federal government in connection with the hiring of an employee, the issuance of a security clearance, the conducting of a security or suitability investigation of an individual, the classifying of jobs, the letting of a contract, and the issuance of a license, grant, or other benefits or awards to the extent that the information is relevant and necessary.

### REFERENCES:

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Joseph Margraf is my supervisor and a long-term Unit leader and biologist with considerable experience in fisheries management and ecology across North America. He is well-respected throughout the fisheries profession, winning the prestigious American Fisheries Society's Meritorious Service Award.

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David Willis is head of the Department of Natural Resource Management at South Dakota State University. He has extensive experience in fisheries management in North America, and has won the American Fisheries Society's Meritorious Service Award, Excellence in Public Outreach and Excellence in Fisheries Education Awards. I worked with him on inland fisheries and standard sampling projects.

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Wayne Hubert was Unit Leader of the Wyoming Cooperative Fish and Wildlife Research Unit and is now retired from that position, working as a fisheries consultant. He authored pivotal books in the fisheries management field including *Inland Fisheries Management in North America*. He served as president of the American Fisheries Society and has won many society awards. I worked with him on inland fisheries and standard sampling projects.

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Lawrence (Larry) Riley is Assistant Director of the Arizona Game and Fish Department, and former Chief of Fisheries. His work with desert fishes, introduced fishes, agency policy, and general natural resource issues has had considerable impact on policy and management of fish and wildlife in the southwestern United States. He is a former president of the Arizona-New Mexico Chapter of the American Fisheries Society. I have worked with him on many desert fish projects.

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William Mannan is chair of the Wildlife and Fisheries Program at the University of Arizona, and is an expert in wildlife-habitat relationships. He coordinates University and Arizona Unit activities and is instrumental in including the unit in program goals and objectives. I work closely with Dr. Mannan on integrating the Unit within the University.

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Nigel Lester was a Chair and Program planner for the AFS national meeting in Ottawa. He has considerable experience in lake fisheries management, northern fisheries, and agency research. He has authored a substantial number of publications on freshwater fisheries sampling. I have worked with him on fisheries sampling issues, conference planning and international issues.