43*rd* Annual Meeting

08-12 November 2011
Hermosillo, Sonora, México

Desert Fishes Council
Consejo de los Peces del Desierto

Dedicated to the Conservation of North America's Arid Land Ecosystems

Tuesday 08 November 2011

EVENTS WILL BE HELD AT HOTEL GANDARA

16:00 - 21:00 Registration - Hosted by DICTUS (Departamento de Investigaciones Científicas y Tecnológicas, University of Sonora (Universidad de Sonora).

18:00 – 21:00 Informal social

Wednesday 09 November 2011

08:00 - 9:15 **Ceremonia de Inauguración** Welcoming Ceremony and Opening Remarks
09:15 - 10:45 GENERAL SESSION - 1
10:45 - 11:00 BREAK
11:00 - 12:00 GENERAL SESSION - 2
12:00 - 14:00 LUNCH
14:00 - 16:00 GENERAL SESSION - 3
16:00 - 18:00 POSTER SESSION

Thursday 10 November 2011

09:15 - 10:30 GENERAL SESSION - 4
10:30 - 10:45 BREAK
10:45 - 11:45 GENERAL SESSION - 5
11:45 - 14:00 LUNCH
14:00 – 16:00 OPEN DISCUSSIONS
16:00 - 17:30 BUSINESS MEETING
18:00 - open BANQUET - **Xochimilco Restaurant**

Friday 11 November 2011

OPEN

Saturday 12 November 2011

08:00 - 17:00 FIELD TRIP

43*rd* Annual Meeting
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Hermosillo, Sonora, México

Wednesday 09 November 2011

8:00 Ceremonia de Inauguración — Welcoming Ceremony

8:45 Opening Remarks — Heidi Blasius, Desert Fishes Council President

GENERAL SESSION 1: Moderator— Brandon Albrecht

09:15 A New Species of *Cycleptus* (Cypriniformes: Catostomidae) from North America

Mayden, Richard L.[1] (1-Department of Biology, Saint Louis University)

For a very long time the Blue Sucker (*Cycleptus elongatus)* was referred to as a single species and descriptions of the species in reports or faunal books characterized its descriptive characters morphology as if they had simply been copied from one account to another. The species is a large river fish, extremely fast swimmer, moves up torrential currents and has been known to leap over low-head dams to reach spawning grounds. Morphological studies beginning in the 1980's by Mayden and Burr and biochemical studies by Buth and Mayden revealed concealed, or rather previously unstudied diversity across the large range of the species. Following continued study of the genus *Cycleptus* morphological and biochemical evidence revealed a divergent evolutionary lineage in the Mobile Basin of the Southeastern US described as *C. meridionalis*. Additional study focusing on diversity within remaining populations of *C. elongatus* using morphological, coloration, allozyme, and molecular techniques reveals a new species endemic to the Rio Grande system and can be diagnosed using any of the above character suites. Herein, we present evidence for and describe this new species of *Cycleptus*.

09:30 Bonneville Basin Area Report

Albrecht, Brandon [1]. (1-BIO-WEST).

With many thanks to a number of co-authors (not all were available at time of abstract submission, but to be acknowledged during the presentation); I present this year's brief summary of activities and highlights associated with native aquatic species found within the Bonneville Basin. The June Sucker Recovery Program continues to be very active. June sucker (*Chasmistes liorus*) are propagated from brood stock held at Utah Division of Wildlife Resources hatchery facility at the Fisheries Experiment Station (FES), Logan, Utah. Record numbers of June sucker are returning to the Utah Lake tributaries to spawn. Least chub (*Iotichthys phlegethontis*) was petitioned to list in 2008. The Fish and Wildlife Service's 12-month finding was released in June 2010 as warranted, but precluded. The states of Utah, Wyoming, Nevada, and Idaho and Federal agencies formed the range-wide team for the northern leatherside chub (*Lepidomeda copei*) and continue to remain very active. Founding of this team has spurred various sampling efforts to document this unique species, and in Idaho, several populations are being studied within historic Snake/Bear River drainages. Preliminary genetics data from efforts in Idaho suggest a fairly recent connection between Bear River and Snake River northern leatherside chub populations. The Wyoming Game and Fish Department is conducting a two year State Wildlife Grant funded project to determine the current distribution of northern leatherside chub in the Bonneville Basin in Wyoming. Specific objectives are to determine baseline abundances for major populations of northern leatherside chub in Wyoming, identify species of sympatric fishes, identify habitat relationships, and collect tissue samples from major populations for genetic analyses. The northern leatherside chub was also petitioned to list and is undergoing a 12-month status review. At time of abstract submission this finding remained pending. The southern leatherside chub (*Lepidomeda aliciae*) team is also finalized and the Southern Leatherside Chub Conservation Agreement and Strategy is supported by signatory agencies solely within Utah.

09:45 Oregon / Northern California Area Report

Scheerer, Paul [1], Miller, Stephanie [1], Reid, Stewart [2], Markle, Doug [3], Hoekzema, Kendra [3], Smith, Roger [4], Schreder, Marci [5]. (1-Oregon Department of Fish and Wildlife, Corvallis, 2-Western Fishes, Ashland OR, 3-Oregon State University, Department of Fisheries and Wildlife, 4-Oregon Department of Fish and Wildlife, Klamath Falls, 5-Lake County Watershed Council, Lakeview OR).

The northwestern extreme of the desert region includes several endorheic drainage subbasins in Oregon, northeastern California, and northwestern Nevada (Fort Rock, Chewaucan, Goose, Warner, Catlow, Alvord, Malheur Lakes, Coyote Lakes, and Quinn). This region supports remnant fish faunas that once inhabited extensive pluvial Pleistocene lakes. Oregon Department of Fish and Wildlife: 1) conducted distribution surveys and obtained population estimates for Interior redband trout, *Oncorhynchus mykiss*, in six subbasins in SE Oregon, 2) estimated Warner Sucker, *Catostomus warnerensis*, abundance in Honey Creek and at Summer Lake Wildlife Area, 3) obtained a population estimate for Borax Lake Chub, *Gila boraxobius*, in the Alvord subbasin, 4) obtained a population estimate and evaluate habitat conditions for Foskett Spring Speckled Dace, *Rhinichthys osculus* ssp., in Foskett and Dace Springs. Stewart Reid, Western Fishes, continued to: 1) suppress nonnative fishes from Modoc Sucker, *Catostomus microps*, habitats in Modoc County, 2) work on lamprey systematics / distribution in the Pit/Goose/Klamath basins, and worked with Jason Baumsteiger (UC- Merced) on western sculpin phylogenetics project, including Pit Sculpins, *Cottus pitensis*. Drs. Doug Markle, Oregon State University (OSU), and Stewart Reid synthesized available taxonomic data and photo-documented listed or list-able Oregon desert fishes for a book-in-progress "Freshwater fishes of Oregon". Dr. Markle (OSU) with help from Paul Scheerer (ODFW) continued collections of fish for a study of the taxonomy and distribution of Alvord and Borax Lake Chub in the Alvord basin. Kendra Hoekzema (OSU), in collaboration with BLM and ODFW, initiated a study of species limits and population structure in speckled daces across the arid drainages of Oregon using phylogenetics, microsatellite analysis, and morphometrics. The work will produce a systematic assessment

of the taxonomic status of the threatened Foskett Speckled Dace, reveal patterns of genetic connectivity across the landscape, and test for the presence of cryptic species or subspecies. Roger Smith (ODFW) and the Miller Lake Lamprey Science Team collected Miller Lake Lamprey, *Entosphenus minimus*, from Miller Creek in the Klamath River subbasin and re-introduced them into Evening Creek, Miller Lake, and Miller Lake below the lake outlet. The team also conducted a survey of Miller Creek and collected maturing lamprey. The team will also sample Miller Lake later this fall to look for evidence of lamprey predation on trout. The Lake County Watershed Council completed several watershed enhancement projects in the Goose Lake subbasin including fish passage and riparian fencing projects.

10:00 **Top predator extinctions in drying streams modify community structure and ecosystem functioning**

Boersma, Kate S. [1], Bogan, Michael T. [1], Lytle, David A. [1]. (1-Oregon State University, Department of Zoology).

Climate change and anthropogenic water withdrawals are causing many once-perennial streams to experience fragmentation or complete drying for portions of the year. One of the most notable changes associated with this transition is the disappearance of large aquatic predators, such as fish and large-bodied aquatic insects. In arid-land streams of southeastern Arizona, habitat contraction and complete drying have been associated with local extinctions of the invertebrate top predator *Abedus herberti* (Hemiptera: Belostomatidae). These extinctions likely cause changes in stream community structure and functioning, however manipulative experiments are necessary in order to disentangle the effects of local predator extinctions from other co-occurring environmental changes. We used mesocosms to represent fragmented stream pools, seeded them with stream invertebrates and then removed *Abedus herberti* as a treatment. We found that the removal of *Abedus herberti* initiated a trophic cascade resulting in decreased algal biomass in treatment mesocosms. This indirect effect of the top predator on algal biomass was likely caused by *Abedus herberti* predation on the mayfly *Callibaetis*, an algae-grazing taxon. *Abedus herberti* removal also affected overall invertebrate community structure. Both the abundance and diversity of secondary predators were higher in mesocosms without *Abedus herberti*, suggesting a competitive release of these smaller predators. The results of our experiment demonstrate that the indirect biotic effects of stream drying can be as important as abiotic drying effects and must be considered when planning conservation efforts in arid-land streams.

10:15 **Drought, top-predator extirpations, and community changes in aridland streams.**

Bogan, Michael [1], Boersma, Kate [1], Lytle, David [1]. (1-Oregon State University, Department of Zoology).

Droughts and anthropogenic water abstractions are reducing stream flows across the world, and especially so in aridland streams. In larger streams, flow reduction can lead to increased water temperature, decreased dissolved oxygen, and habitat fragmentation, negatively impacting fish and invertebrate populations. The effects of drought in small, fishless streams, however, are less understood. Through a variety of observational and experimental studies, we found that drought-induced habitat loss in small headwater streams of Arizona is causing a number of population and ecosystem level changes. Arguably, the most important effect of stream drying is the extirpation of the system's top predator, the giant water bug *Abedus herberti*, along with several other taxa requiring perennial water to survive. Drying events at multiple sites within a mountain range may also reduce the pool of nearby colonists when flows recover following drought, and thus may reduce the resilience of local communities. In two of our long-term study streams where drought-induced habitat contraction and extirpation events occurred, *A. herberti* and several other perennial taxa were unable to reestablish local populations, even 6-8 years after the initial extirpation event, while smaller, more vagile secondary predators flourished. Additionally, results from experimental mesocosm studies in which *A. herberti* were removed as a treatment suggest that the loss of this species alone can cause a trophic cascade. Comparing the results of our regional stream surveys over the last 10 years with historical collection records of *A. herberti*, it appears that this top predator may be disappearing from multiple streams across the region, and perhaps from entire mountain ranges. Our observational and experimental studies document current extirpations happening in headwater aridland streams, demonstrate the ecosystem-level impacts these extirpations may be having, and highlight the need for regional conservation planning to prevent the extinctions of perennial stream species like *A. herberti*.

10:30 **Characterizing predictive models of climate change and agricultural intensification on *Oncorhynchus mykiss* (steelhead) in the Umatilla River, Oregon, USA.**

McMullen, Laura E. [1], Wooster, David [1], DeBano, Sandy [1], Schwartz, Jesse [2]. (1-Oregon State Univerity, 2-ICF International).

The Umatilla River in the high desert of northeastern Oregon is home to populations of Chinook salmon (*Oncorhynchus tshawytsha*), coho salmon (*Oncorhynchus kisutch*), and summer steelhead (*Oncorhynchus mykiss*). This threatened river has experienced intense agricultural development that historically extirpated some salmonid species while severely reducing others. Measures were installed to restore salmonids, however future pressures from climate change and agricultural intensification may increase stress on the ecosystem and again challenge fish populations. Predicted effects of climate change in the region include temperature increases, increases in winter precipitation, increases in late fall and winter flow, and decreases in summer flow. Agricultural intensification is predicted to reduce the number of stream miles protected by riparian buffers. As part of a larger project examining how the Umatilla River drainage can be managed to support multiple ecosystem services under future pressures, we are using mathematical models to simulate stressor effects on steelhead populations. One approach we are using to predict effects of environmental changes on steelhead is EDT, or 'Ecosystem Diagnosis and Treatment'. This is a species-specific, habitat-based model that relates environmental conditions to productivity and carrying capacity of life-stages, resulting in overall predictions of population productivity and capacity. Currently, we are parameterizing the model for alternate future scenarios. Results of this work will aid in long-term planning of Umatilla River management and protection of habitat for steelhead.

10:45 – 11:00 BREAK

GENERAL SESSION 2: Moderator—Clayton Crowder

11:00 **Razorback sucker (*Xyrauchen texanus*) monitoring on Lake Mead Nevada and Arizona, 2011**

Rogers, Ronald [1], Shattuck, Zachary [1], Albrecht, Brandon [1], Holden, Paul [1]. (1-BIO-WEST Inc.).

For the 15th consecutive year, distribution, recruitment, and population trends of wild razorback sucker (*Xyrauchen texanus*) in Lake Mead Nevada and Arizona were monitored with funding provided by the Bureau of Reclamation and Southern Nevada Water Authority. In order to assess this unique, wild

razorback sucker population, several techniques including: sonic surveillance, trammel netting, and larval fish surveys were employed during the winter/spring spawning season in 2011. Razorback sucker appeared to have had a successful spawning year in 2011. A total of 86 wild razorback sucker were captured from three long-term monitoring sites and 72 new, wild razorback sucker fin rays were collected for aging analysis. To date, 608 wild razorback suckers have been captured from Lake Mead. Additionally, 360 fin ray sections have been collected and analyzed; helping to illustrate the continued recruitment of wild razorback sucker from 1978 to 2008. The 2005 year-class continues to be a strong year for recruitment in Lake Mead. Increases in lake level due to high flow events in 2010-2011 may have helped to provide cover in the forms of turbidity, inundated vegetation, and large woody debris for all life stages of razorback sucker. The increase of lake level may provide physical and environmental factors necessary to allow a pulse in recruitment for the 2011 year-class. Future research will provide data to lend comprehension into this possibility. While current studies have provided a great deal of insight into the habitat use of adult fish, only limited information pertaining to subadult and young of year razorback sucker nursery habitat has been identified in Lake Mead. Continued study should focus on this critical life stage to aid in the understanding of recruitment on Lake Mead and perhaps enable this trend within the Colorado River Basin.

11:15 **Using telemetry as a tool to locate razorback sucker (*Xyrauchen texanus*) spawning aggregates and identify wild recruitment in Lake Mead NV, AZ**

Kegerries, Ron [1]. (1-BIO/WEST).

Sonic telemetry was first implemented in the Lake Mead razorback sucker (*Xyrauchen texanus*) studies during the 1996-1997 study year. During the past 15 years a total of 82 razorback sucker have been equipped with coded sonic transmitters. It was thought that telemetry would provide valuable biological data regarding movement, habitat use, and spawning locales throughout Lake Mead, much as it has throughout the Colorado River Basin with other native fishes. Recognizing patterns of habitat use and using these individuals to locate wild razorback sucker spawning aggregates have increased sampling efficiency and effectiveness and has helped to identify wild recruitment of this unique population in Lake Mead. Additionally, the use of sonic telemetry in the Lake Mead razorback sucker studies resulted in the discovery of two previously unknown spawning aggregates. Not only do these findings help confirm the overall utility of this method in locating spawning locations, but also underscore how telemetry techniques have helped in better understanding the overall size and habitat use of wild Lake Mead razorback sucker populations. Sonic telemetry has been a valuable tool in tracking spawning aggregate shifts in this highly dynamic reservoir as water levels have fluctuated over time. Although sonic telemetry technology has been used for many years as a method to study various fish species, it has proved to be a valuable tool in the Lake Mead razorback sucker studies when combined with other methods to evaluate wild recruitment. Furthermore, these methods may be applicable in locating other unknown spawning aggregates, or establishing a new population of razorback sucker elsewhere in the Colorado River Basin.

11:30 **Evaluation of spikedace *Meda fulgida* and loach minnow *Tiaroga cobitis* repatriations**

Robinson, Anthony T. [1], Crowder, Clayton D. [1]. (1-AZ Game & Fish Dept., 2-AZ Game & Fish Dept).

Spikedace *Meda fulgida* and loach minnow *Tiaroga cobitis*, two federally-threatened species, have extant populations in few streams in Arizona and New Mexico and therefore repatriations are primary actions to recover these species. Since 2007, these two species have been repatriated to four streams in Arizona: Hot Springs Canyon, Redfield Canyon, Fossil Creek, and Bonita Creek. Success (population establishment) of these repatriations has been hard to judge because of the adherence to a strategy of annual stockings and difficulty in detecting individuals during monitoring. In Hot Springs Canyon, numbers of spikedace and loach minnow captured increased each year from 2008 thru 2010, and young-of-year were captured each year indicating that both species may have established populations in this stream. Numbers of spikedace or loach minnow captured or observed in the other three streams were much more variable during the same time period, and often only adults were captured, so it is far less certain if either species have established populations in these streams. Environmental features such as gradient or amount of suitable mesohabitat may influence the likelihood that either of these species establishes a population in repatriation streams. Gradient over a 5 km distance at historically occupied sites was less than about 2% for loach minnow and less than about 1.0% for spikedace. However, gradient over 5 km was greater than 1% through all of the repatriation streams: 1.1% in upper Bonita, 1.3% in lower Bonita, 1.5% in Hot Springs Canyon, 2.0% in Redfield Canyon, and 2.7% in Fossil Creek. Hot Springs Canyon has more cobble riffles and sandy runs than the other three streams, and so may have the best habitat for loach minnow and spikedace. Presence of green sunfish may have affected the likelihood of population establishment in Redfield Canyon and lower Bonita Creek; efforts to eradicate this nonnative species are ongoing. After cessation of repatriation efforts, continued annual monitoring for at least three years (the approximate life-span of these species) will be necessary to determine if these two species have established populations in the repatriation streams.

11:45 **An update of Fossil Creek native fish management actions since 2007**

Crowder, Clayton D [1], Robinson, Anthony T [1], Rogers, Roland S [1], Benedict, Charles [1], Rinker, Matthew [1]. (1-Arizona Game and Fish Department).

Fossil Creek, a warm-water perennial tributary of the Verde River in central Arizona, is known as an iconic native fish restoration project. The stream was restored as a native fishes system in 2004, and since 2007 the Arizona Game and Fish Department (AGFD) in coordination with a multi-agency partnership has stocked longfin dace *Agosia chrysogaster*, federally threatened spikedace *Meda fulgida* and loach minnow *Tiaroga cobitis*, and federally endangered Gila topminnow *Poeciliopsis occidentalis* and razorback sucker *Xyrauchen texanus*. During subsequent monitoring, longfin dace abundance increased over the years, but the listed-species have either been present or absent, so it is still unclear if any of those will establish populations. In an effort to increase public awareness and appreciation of native fish and native fish conservation efforts in Arizona, AGFD opened Fossil Creek as a catch-and-release chub-only fishery in October 2009. A 4.5 mile section of Fossil Creek was designated as a headwater chub *Gila nigra* and roundtail chub *Gila robusta* fishing area. Sampling by AGFD within this 4.5 mile stretch has shown that overall chub abundance, distribution and age class has not been negatively impacted by the catch-and-release season. Likewise, the overall impact of hooking injury has also notably decreased within the special regulation fishing reach. Overall, Fossil Creek appeared to be a continuing success story for both native fish repatriations and a native chub fishery. However, in July 2011, smallmouth bass *Micropterus dolomieu* were discovered above the constructed fish barrier. Subsequent surveys indicated that smallmouth bass were distributed up to about 2.5 miles upstream of the barrier. Agencies reacted and volunteers were recruited. Arizona Game and Fish led removal efforts throughout the smallmouth bass inhabited section using gill nets, snorkeling and hook-and-line fishing. To stop the upstream invasion, a temporary barrier was built by Bureau of Reclamation approximately 200 meters upstream of the upper-most location where smallmouth bass were observed. No smallmouth bass have been observed upstream of the temporary barrier, and AGFD continues to perform removal in the invaded stretch.

12:00 – 14:00 LUNCH

GENERAL SESSION 3: Moderator— Kathryn Boyer

14:00 **Piscine tuberculosis in Chichencanaab, a case study**

Valdes-Gonzalez, Arcadio [1]. (1-Laboratorio de Acuacultura, Facultad de Ciencias Biologicas, UANL).

Micobacteriosis in fish (PTB) is a disease greatly misunderstood. Cosmopolitan, ubiquitous, present in all sorts of bodies of waters, even in swimming pools, it is capable of free-living and doing all kind of damage once inside a host. When a host is subsequently stressed on multiple occasions, it causes symptoms from small skin blisters or reddening, skin darkening, popped eyes, cartilage destruction, backbone distortion, tremors and swimming unbalanced, apathy, lack of appetite, emaciation, or even death without symptoms. This opportunistic pathogen can attack all kinds of marine and freshwater fish and many other animals. This program began in 2004 to breed *Cyprinodon simus*, believed to be extinct in the wild, under captivity for massive captive production for a reintroduction effort lead by Dr. Juan Jacobo Schmitter. This fish originated at the Lagoon of Chichancanab, a body of water in the central region of Quintana Roo, Mexico, about 30 km long, 1-3 km width, narrowed and intermittent during dry season. We attempted to maintain this species in 2006, 2008, 2009, however they soon became sick and died without any descendants. In 2010 we visited locations from Presumida, Dziuché, Parque de Chichancanab, and Cenegosa, to verify if fish are contaminated from origin with *Mycobacterium*. We found the different areas completely altered: very shallow, with native Mangrove bush and vegetation scarce and dying, in full agricultural and Mayan urban development. Most fish collected had PTB symptoms, many died by 24 hrs. A total of 7 species were sampled with the methodology of vent-mucus smears and preserved, showing all sampled material had Micobacteria and a variety of Gram-positive bacterias in it. Once the situation was understood, we are in position to handle our fish appropriately in order to keep the specimens collected alive and avoiding any stressing events to get descendants from *C. simus* and *Cyprinodon labiosus*.

La Micobacteriosis en peces (PTB) es una enfermedad fuertemente malentendida, capaz de existir en vida libre, cosmopolita presente en todo el mundo, desde aguas marinas hasta en albercas, invade a su hospedero solamente cuando es estresado sucesivamente, causando una diversidad de síntomas, desde pequeñas lesiones en la piel, enrojecimiento y úlceras, decoloración u obscurecimiento, ojo saltón, destrucción de cartílago, deformación de la columna, apatía, falta de apetito, emaciación, estremecimiento y nado errático, o fallece sin ningún síntoma. éste proyecto inicia en 2004 para reproducir al *Cyprinodon simus* en cautiverio para su posible reintroducción, bajo la sugerencia del Dr. Juan Jacobo Schmitter, puesto que esta especie se supone extinta. ésta especie es originaria de la Laguna de Chichancanab, Quintana Roo, México, con 30 km de largo y de 1-3 de ancho con angusturas e intersecciones en la temporada de sequía. Se intentó mantener esta especie en cautiverio en 2006, 2008 y 2009, perdiendo todos los ejemplares bajo una diversidad de síntomas, sin poder identificar el patógeno se supuso la presencia de PTB. En 2010 se visita la zona muestreando las localidades de Presumida, Dziuché, Parque Chichancanab y Cenegosa, para verificar la hipótesis de que los peces son portadores de *Mycobacterium* desde su origen. El área se encuentra fuertemente alterada, los cuerpos de agua muy someros, los manglares y vegetación riparia nativa escasa, extinguiéndose y las comunidades Maya en pleno desarrollo urbano y agrícola. La mayoría de los peces colectados mostraron síntomas de PTB, muchos no sobreviven las 24 hrs en cautiverio. Un total de 7 especies fueron muestreadas en improntas de mucus-ventral y se fijaron, obteniéndose en todas las laminillas bacilos ácido-alcohol resistentes caracterísitcos de *Mycobacterium spp*., así como una variedad de bacterias Gram-positivas. Una vez que fue comprobada la hipótesis, fuimos capaces de proporcionar un manejo más adecuado y menos estresante a nuestros peces para lograr mantenerlos vivos y obtener descendencia de *C. simus* y *Cyprinodon labiosus*.

14:15 ***Mycobacterium* in native protected fishes**

Carreon-Zapiain, Maria Teresa [1], Valdes-Gonzalez, Arcadio [1]. (1-Laboratorio de Acuacultura, Facultad de Ciencias Biologicas, UANL).

Mycobacterium spp. are free-living bacteria and opportunistic pathogens with cosmopolitan distribution; the disease manifests only in stressed individuals. Several antibiotics have been tried without results; therefore, it is recommended to sacrifice the infected fish and aquariums and ponds disinfection with sodium hypochlorite. We consider this a very drastic measure when working with native endangered fishes. Chichancanaab, Quintana Roo, is a heavily impacted habitat that caused the collected specimens to die of piscine tuberculosis. In balanced environments fish live infected with *Mycobacterium* yet healthy, but subjecting them to capture stress advances the disease. Thus, the early diagnosis of *Mycobacterium* is essential to prevent this malady. Ziehl-Neelsen stain (ZN) of vent smears is a non-invasive technique that without sacrificing the specimen provides for rapid detection of *Mycobacterium spp.*, and therefore take preventive measures on the spread of the disease to the rest of the facility. 20 symptomatic specimens of *Lucania parva* and 20 healthy *Poeciliia mexicana* whose place of origin is a known carrier of *Mycobacterium* were anesthetized. The sample was taken from the specimen cloacal area, pressing lightly against a slide, releasing mucus and excreta, then proceeding with ZN and observed under the microscope at high resolution; considered positive when at least one Gram-positive rod was observed. All *L. parva* and 15 of 20 specimens of *P.mexicana* were positive for tuberculosis, finding also a variety of other Gram-positive bacteria. Our detections are supported by the morphology described by Noga et al. (1990), Frerichs (1993) and Yanong et al. (2003) for Gram-positive bacteria. ZN staining of slides from vent smears can provide early detection of Micobacteriosis and allow for measures to avoid further spread of the disease. We recommend extreme caution at handling to reduce the excessive and unnecessary stress events.

Mycobacterium spp. es un patógeno oportunista de vida libre y distribución cosmopolita, provocando infección en múltiples especies, se desarrolla sólo cuando existe estrés en los individuos. Se han probado varios antibióticos sin lograr controlar esta afección. Por lo tanto recomiendan sacrificar a los organismos y desinfectar con hipoclorito de sodio las instalaciones; medida muy drástica cuando se trabaja con especies nativas en peligro de extinción. En Chichancanaab, Quintana Roo, el hábitat está fuertemente impactado causando que al colectar los ejemplares mueran. En ambientes equilibrados los peces viven saludables aún infectados con la micobacteria, pero al someterlos en cautiverio, el estrés permite avanzar a la enfermedad. Así, el diagnóstico temprano de *Mycobacterium* se hace imprescindible. La tinción de Ziehl-Neelsen (ZN) de improntas cloacales para la detección rápida de *Mycobacterium spp.* de manera no invasiva y sin sacrificar al ejemplar, permite tomar medidas de prevención que eviten la diseminación de la enfermedad al resto de las instalaciones. Fueron anestesiados 20 ejemplares de *Lucania parva* sintomáticos y 20 de *Poeciliia mexicana* sanos cuya localidad de origen es portadora de *Mycobacterium*. La muestra fue tomada del área cloacal, presionando ligeramente al ejemplar contra una laminilla liberando mucus y excretas, procediendo con ZN y observar al microscopio en 100X, considerando positivo el obtener al menos un bacilo Gram-positivo.El total de *L. parva* y 15 ejemplares de *P.mexicana* fueron positivos para tuberculosis, encontrando además una variedad de bacterias Gram-positivas. Nuestros hallazgos son respaldados por la morfología de los bacilos Gram-positivos descrita por Noga et al. (1990), Frerichs (1993) y Yanong et al. (2003). La tinción de ZN en improntas cloacales permite llevar a cabo medidas preventivas para evitar la diseminación de la enfermedad, recomendando el disminuir al máximo el manejo excesivo y eventos de estrés innecesarios.

14:30 **Plecos threatens mexican biodiversity and economy**

Renteria-Faz, Rutilio [1], Valdes-Gonzalez, Arcadio [1]. (1-Laboratorio de Acuacultura, Facultad de Ciencias

Biologicas, UANL).

In commercial inland fisheries, Mexico places 4th in the American continent, this being one of the most important commercial activities in the country. Mexico is home to nearly two-thirds as many freshwater fishes as those that swim the waters of the United States and Canada combined. The invasive pleco (*Loricarids spp.*) has widely expanded to reservoirs and local rivers of Michoacan, Tamaulipas, Nuevo Leon, and Tabasco and it has been reported in south and middle Texas. The pleco is one of the most dangerous introduced species to the biodiversity known to date; it should not be taken lightly that the stability of cichlids in the central- south, middle and north-eastern zones of mexican commercial fisheries has already decreased almost by half, impacting the biodiversity and economy of the country. According to the Mexican fishing annuary of CONAPESCA the production of "mojarra" and tilapia decreased by almost 35 percent from the years 2005 to 2009. Interviews with the groups of fishermen in the "Falcon" dam say that almost half of their total catch is armadillo catfish. Fishermen are calling for help in Michoacan, Tabasco and Tamaulipas, and there is no one to answer their quest for a solution to this invader. "Mojarras" are disappearing, been replaced by the "armored catfish" or "Devil fish". Its common name describes a creature as coming from hell to destroy their nets and hurt their hands. Fish Department official staff have only offered partial solutions for the seriousness of the destruction at Infiernillo Dam, and made bylaws and fishing regulations limiting the amount of daily catch to five specimens of tilapia per fisherman, and all the armored catfish they want, in one attempt to recover the commercial catch. They also prepared a Recipe Book with over "fifty ways to cook the Devil Fish" recommending to make some positive use of the menace, instead of doing something to control the advance of the destruction by this invasive species. Talking to the society about this big problem is the first step in this battle to avoid future expansion of the pleco's invasive territory.

México se posiciona en el 4to lugar del continente Americano en la pesca continental comercial, siendo esta una de las actividades comerciales más importantes para la nación. México es hogar de cerca de dos tercios de peces de agua dulce como los que nadan en las aguas de los Estados Unidos y Canadá juntos. El pez invasor Pleco (Loricáridos) está totalmente expandido en Michoacán, Tabasco, Chiapas, Nuevo León, Tamaulipas y ha sido reportado en el centro y sur de Texas. Siendo ésta es una de las especies introducidas más peligrosas conocidas hasta la fecha, no debería de tomarse a la ligera el hecho de que la estabilidad de los cíclidos en las zonas comerciales del centro-sur, centro, y noroeste de México ya ha disminuido a la mitad, impactando y alterando la biodiversidad y economía de la nación. De acuerdo al anuario de pesca mexicana de CONAPESCA la producción de "mojarras" y tilapias se ha disminuido en un 35% en el período 2005-2009. Los pescadores de la presa "Falcon" argumentan que la mitad del total de su pesca diaria es el "bagre armado". Los pescadores solicitan ayuda para solucionar la problemática con este invasor en Michoacán, Tabasco y Tamaulipas pero no han recibido respuesta alguna. Las "mojarras" están desapareciendo para ser reemplazadas por el pez diablo o bagre armado. Sus nombres comunes describen a esta creatura como proveniente del infierno para destruir los nidos de las especies y lastimar las manos de los pescadores. Los funcionarios del departamento de pesca han ofrecido evaluaciones parciales de la gravedad de la destrucción en la presa de Infiernillo, y han regulado leyes limitando la pesca de solo 5 especímenes de tilapias por pescador, y todo el pez diablo que puedan capturar en un intento por recuperar el potencial de pesca; crearon y distribuyen el libro "50 maneras de cocinar el pez diablo" recomendando dar un uso positivo a este invasor, en vez de hacer algo para controlar a esta especie invasora. Hablar a la sociedad sobre esta problemática es el primer gran paso para evitar la expansión del territorio invadido por el pleco.

14:45 **Genetic evaluation of San Bernardino springsnails, *Pyrgulopsis bernardina,* in the San Bernardino River watershed of Sonora, México**

Varela-Romero, Alejandro [1], Myers, Terry [2], Sorensen, Jeff [3], Abarca, Francisco [4]. (1-Universidad de Sonora, 2-167 E 7th Street, Eagar, AZ, 3-Arizona Game and Fish Department, Native Fish and Invertebrate Program, 4-Arizona Game and Fish Department, International and Borderlands Program).

Distributional and genetic studies of San Bernardino springsnail, *Pyrgulopsis bernardina,* have been very limited and, genetic relationships between populations of *Pyrgulopsis* within the upper San Bernardino River basin in Sonora, Mexico in relation to those from the type locality in Arizona, have not been evaluated. To evaluate distribution, we visited sites historically occupied by *Pyrgulopsis*. At each site we searched for *Pyrgulopsis* in different microhabitats, and various substrates, and collected 20 to 30 individuals of various sizes. We obtain a partial sequence of the Cytochrome Oxidase I gene (COI) of the mitochondrial DNA to evaluate the identity of the native springsnails populations in relation to sequences previously obtained from the type locality of *P. bernardina* in Arizona. In this study, we documented the continued existence of *Pyrgulopsis*, at all sites where the springsnails previously had been reported in the upper San Bernardino River basin of Sonora, México. We also documented the occurrence of *Pyrgulopsis*, at one previously unreported location. Three of the sites where we found *Pyrgulopsis*, were in the Arroyo San Bernardino drainage, and two of the sites were in the Arroyo Cajón Bonito. The COI sequence fragment from all four sites in Sonora were coherent with COI fragments previously deposited at GenBank from *P. bernardina*, collected from the type locality, and reveal monophyly of Mexican populations in the San Bernardino and Cajon Bonito sub-basins. Major threats to Mexican populations detected were habitat alterations, water depletion and control, introduction of exotics, and aquatic vegetation control issues. Presently protection of these populations of *P. bernardina* does not exist in México. Regulations to protect and conserve the species in both the United States and Mexico do not reflect adequately the conservation needs of San Bernardino springsnail.

Los estudios de distribución y genéticos del caracol de manantial de San Bernardino *Pyrgulopsis bernardina*, son muy limitados y las relaciones genéticas entre las poblaciones de *Pyrgulopsis* dentro de la cuenca alta del San Bernardino en México en relación a las de la localidad tipo en Arizona no han sido evaluadas. Para evaluar la distribución visitamos los sitios históricos ocupados por *Pyrgulopsis*. En cada sitio buscamos *Pyrgulopsis* en diferentes microhábitats y en varios sustratos donde recolectamos de 20 a 30 individuos de varias tallas. Obtuvimos la secuencia parcial del gen Citocromo Oxidasa I (COI) del ADN mitocondrial para evaluar la identidad de las poblaciones de caracoles nativos en relación a las secuencias previamente obtenidas de la localidad tipo de *P. bernardina* en Arizona. En este estudio documentamos la existencia actual de *Pyrgulopsis* en una localidad previamente no reportada. Tres de los sitios donde encontramos *Pyrgulopsis* estuvieron en la cuenca del San Bernardino y dos de estos sitios se encontraron en el Arroyo Cajón Bonito. Los fragmentos de las secuencias del COI de todos los sitios en Sonora fueron coherentes con los fragmentos de COI previamente depositadas en el Gen Bank de *P. bernardina* recolectados en la localidad tipo, y revelan la monofilia de las poblaciones Mexicanas en las subcuencas del San Bernardino y el Cajón Bonito. Las principales amenazas detectadas para las poblaciones Mexicanas fueron las alteraciones de hábitat, reducción y control del agua, introducción de exóticos y los temas relacionados con el control de la vegetación acuática. La protección actual de estas poblaciones de *P. bernardina* no existe en México. La reglamentación para la protección y conservación de la especie en Estados Unidos y México no refleja adecuadamente las necesidades de conservación del caracol de manantial de San Bernardino.

15:00 **Population genetic variability of Yaqui trout (*Oncorhynchus* sp) in the Mesa Tres Rios area, Sonora**

Ballesteros-Cordova, Carlos [1], Grijalva-Chon, Manuel [1], Camarena-Rosales, Faustino [2], Castillo Gamez, Reyna [1], Brooks, James E [3], Varela-Romero, Alejandro [1]. (1-Universidad de Sonora, Departamento de Investigaciones

Científicas y Tecnológicas, 2-2. Universidad Autonoma de Baja California, Facultad de Ciencias, 3-3. U.S. Fish and Wildlife Service, Albuquerque).
The Yaqui trout is one of the undescribed native trouts of genus *Oncorhynchus* recorded in the Northwest of Mexico. Initial molecular studies suggest the Yaqui trout as a close form of the rainbow trout, but recent molecular and morphological studies of native trouts of Sierra Madre Occidental recognize the specific identity of the Yaqui trout and propose it as the native trout of the Yaqui and Mayo rivers. However, the knowledge of the natural history of this fish still scarce, and this is the reason to study the population genetic structure and the conservation status of the Yaqui trout populations in the Mesa Tres Rios, Sonora. Two creek drainages from the Mesa Tres Rios area were sampled to compare the intraspecific genetic structure. We collected 62 specimens in both creek drainages from which we obtained 49 complete Control region sequences of the mitochondrial DNA for the analysis of the genetic variability. Of a total of 24 haplotypes, only two of them were found in both drainages. Results show a lower population genetic differentiation and a high migrants number per generations resulting in a lacking of population structure, and supporting that there is only one trout population in the sampled drainages.

La trucha Yaqui es una de especies nativas del género *Oncorhynchus* registradas para el Noroeste de México que aún no han sido descritas formalmente para a ciencia. Estudios moleculares iniciales consideran a la trucha del Río Yaqui como una forma muy cercana a la trucha arcoíris, pero estudios genéticos y morfológicos recientes de truchas nativas a la Sierra Madre Occidental reconocen su identidad específica, sugiriéndola como nativa de las cuencas de los Ríos Yaqui y Mayo. Sin embargo el conocimiento de este pez es escaso por lo que este trabajo propone determinar la estructura genética y el estado de conservación de las poblaciones de la trucha Yaqui en la región de Mesa Tres Ríos, Sonora. Se muestrearon dos vertientes geográficas de la región de Mesa Tres Ríos para así comparar su estructura genética intraespecífica. Se recolectaron 62 ejemplares de las dos vertientes de las que se obtuvieron 49 secuencias de la región control del ADN mitocondrial para el análisis de variabilidad genética. Se detectaron un total de 24 haplotipos, dos de ellos encontrados en ambas vertientes. En base a los resultados se obtuvo un bajo índice de diferenciación genética poblacional y un alto número de migrantes evidenciando la ausencia de estructura genética, sugiriendo la existencia de una sola población de truchas habitando los arroyos muestreados.

15:15 **Population genetic variability of the Yaqui catfish (*Ictalurus pricei* (Pisces: Ictaluridae) in the Yaqui River Basin, Sonora, and Chihuahua**

Trujillo-Villalba, María Irais [1], Grijalva-Chon, Manuel [1], Brooks, James E. [2], Varela-Romero, Alejandro [1]. (1-Universidad de Sonora, Departamento de Investigaciones Científicas y Tecnológicas, 2-2. U.S. Fish and Wildlife Service, Albuquerque).
The Yaqui catfish (*Ictalurus pricei*) is the native species recorded in Yaqui, Sonora, and Mayo, Fuerte, and Casas Grande basins in Northwest Mexico. Actually, it now only occurs in the Yaqui and Fuerte rivers. Official conservation status is threatened. Because of the impact of the introduction of exotic catfishes (*I. punctatus, I. furcatus*) which occurs in their natural habitats, and records of hybridization with the former exist, the status of this species is proposed to change to endangered. Beyond actual and potential threats to the Yaqui catfish by the use of congeneric catfishes for aquaculture, the knowledge of genetic population structure is required for the conservation of this national native genome. This work evaluates the genetic variability between Bavispe and Aros-Papigochic-Sirupa (Tutuaca) subbasins in the Yaqui basin to know the population genetic structure for conservation and potential uses in aquaculture. The genetic variability was estimated by analysis of the nucleotidic sequences of the control region (CR) of the mitochondrial DNA in the Bavispe and Tutuaca subbasins in Sonora and Chihuahua. From 33 specimens collected in the Tutuaca River, and 30 of the Bavispe; fin clips were obtained for DNA amplifications by specific primers. The complete sequence of the CR was obtained from 63 specimens to conduct the analysis of the population structure by means of Arlequin software. Control region sequences genetic variation at the level of nucleon diversity, nucleotide diversity, haplotype diversity, homogeneity of genetic frequencies, and differentiation between populations.

El bagre Yaqui (*Ictalurus pricei*) es la especie nativa para las cuencas de los ríos Yaqui, Sonora, Mayo, Fuerte y Casas Grandes en los estados de Sonora, Chihuahua y Sinaloa en el Noroeste de México. Actualmente sólo habita las cuencas de los ríos Yaqui y Fuerte. Su estatus de conservación oficial en México es amenazado. Debido al impacto por la introducción de bagres exóticos (*I. punctatus, I. furcatus*) que ocupan sus hábitats naturales y del primero se han registrado eventos de hibridación se ha propuesto cambiar su estatus a en peligro de extinción. Dadas las amenazas actuales sobre el bagre Yaqui y las potenciales por el uso de bagres congéneres exóticos para acuicultura, urge conocer la estructura genética poblacional de este representante del germoplasma nacional. Este trabajo evaluará su variabilidad genética en las subcuencas de los ríos Bavíspe y Aros-Papigochic-Sirupa (Tutuaca) en la cuenca del río Yaqui para conocer la estructura genética poblacional con fines de conservación y utilización acuícola potencial. La variabilidad genética se estimará por PCR-RFLP y análisis de las secuencias nucleotídicas de la región control (RC) del DNA mitocondrial de las subcuencas de los ríos Bavíspe en Sonora y Tutuaca en Chihuahua. De los 33 especimenes recolectados en la subcuenca del río Tutuaca y 11 del Bavíspe se tomó tejido de aleta pélvica y se extrajo el DNA para la amplificaron de la RC utilizando cebadores específicos. Para su análisis por PCR-RFLP se utilizaron 9 endonucleas de restricción y se secuenció cada producto de PCR para el análisis de su variación. Para el procesamiento de la información se utilizarán Arlequín, PHYLIP y PAUP. La variabilidad genética se calculará por la estimación de la diversidad de nucleón y la diversidad de nucleótido, por el número de sustituciones netas de nucleótidos, la homogeneidad de las frecuencias de haplotipos, el porcentaje de divergencia de secuencias entre haplotipos y el análisis Gst entre muestras. Hasta el momento se logró obtener la región control completa de las 33 muestras pertenecientes al Río Tutuaca y de 5 de las 11 muestras del río Bavíspe.

15:30 **Conservation and management of the Rio Sonoyta pupfish (*Cyprinodon eremus*) in Sonora**

Izaguirre Pompa, Izar [1]. (1-CONANP).
The Rio Sonoyta pupfish (*Cyprinodon eremus*) is an endangered species that is extremely rare and threatened. The pupfish, formerly considered a subspecies of the endangered desert pupfish, occurs at only two sites in the wild; a one-acre pond at Quitobaquito Springs on Organ Pipe Cactus National Monument in Arizona, and just across the border in a one kilometer-long reach of the Río Sonoyta, in northern Sonora. The risk of extinction for the Rio Sonoyta pupfish is very high because its distribution is so limited. Excessive groundwater pumping in a dry year combined with predation from nonnative fish species could easily eliminate the Río Sonoyta populations of Rio Sonoyta pupfish and longfin dace. The recovery plan for the pupfish calls for the creation of three reestablished populations in the Río Sonoyta drainage. In the last four years, a partnership led by the La Reserva de la Biosfera El Pinacate y Gran Desierto de Altar has created and stocked several refuge sites with Rio Sonoyta (Agua Dulce reach) pupfish and longfin dace from the Río Sonoyta. Two are located at the Pinacate Reserve, one at the Intercultural Center for the Study of Deserts and Oceans (CEDO) in Puerto Peñasco, and one in the town of Sonoyta, at the high school (COBACH). Other conservation actions include an additional refuge population at the Quitovac Indigenous Community, monitoring of the river, and fish monitoring and maintenance of the refuge ponds. Future plans also include addressing vegetation management at the refuge ponds, working with partners on education, augmenting existing pupfish refuges in the U.S, and creating of one or two refuges in the U.S. for the longfin dace.

15:45 **Refuge populations of Rio Sonoyta pupfish (*Cyprinodon eremus*) and longfin dace (*Agosia chrysogaster*) in COBACH Campus Sonoyta.**

Lopez Mendez Prof., Jaime [1]. (1-Cobach Plantel Sonoyta).

The Rio Sonoyta, or Quitobaquito pupfish (*Cyprinodon eremus* and longfin dace (*Agosia chrysogaster*) of the Sonoyta River are endangered species and are extremely rare and threatened. The Quitobaquito pupfish is a subspecies of the Desert pupfish (*Cyprinodon macularius*). It is found wild in only two places - in a natural pond, Quitobaquito springs, in Organ Pipe Cactus National Monument in southern Arizona in the U.S. and on a stretch of 1 to 5 km of the Sonoyta River in northwestern Sonora State. Although the longfin dace is more widely distributed as a species, this population may differ from other populations and taxonomy may be modified due to its isolation. Currently the risk of extinction of the species Quitobaquito pupfish and longfin dace in the Sonoyta region has increased considerably over the last decade; climate change, excessive pumping of water, pollution of the Rio Sonoyta, predation by nonnative species, reductions in the flow of water from springs and potential risks of biological or chemical contamination are primary threats to these native species of Sonoyta. One proposal for the conservation of these species was building fish pond refuges in different parts of the Sonoyta River region. This is why a pond refuge was established within the premises of the College of Bachelors of Sonora Campus. Sonoyta populations of the Desert pupfish and Longfin dace were collected from Sonoyta River watershed for protection. Several species of plants characteristic of the Sonoyta River region were also introduced. The pond is not only helping the recovery of the species mentioned above, it is also used as a conservation tool to educate students and residents on the importance of preserving our exotic and rare natural resources of the desert. Currently students from the College of the State of Sonora High School Graduates in coordination with school authorities are carrying out maintenance and improvements to the pond refuge which has approximately 1,000 fish of both species. In addition to this project was a joint effort between institutions such as U.S. Fish and Wildlife Service, the Biosphere Reserve of Pinacate and Gran Desierto de Altar, CEDES, H. Municipality of Gen. Plutarco Elias Calles, Arizona Game and Fish Department, CEDO, Lions Club "Sonoyta AC", Caldwell Design, Organ Pipe Cactus National Monument, UofA, University of Arizona Cooperative Extension and students of Oregon State University Fish and Wildlife Club.

El pez Pupo de Quitobaquito y el Charal de Aleta larga del Río Sonoyta son extremadamente raras , se encuentran amenazadas y en peligro de extinción. El pez pupo de Quitobaquito es una subespecie del Pupo del Desierto que se encuentra solamente en dos sitios silvestres; en un estanque natural en los manantiales de Quitobaquito en el Parque Organ Pipe Cactus National Monument al sur de Arizona en Estados Unidos y en un tramo de 1 a 5 kilómetros del Río Sonoyta en el Noroeste del Estado de Sonora. Aunque el charal de Aleta Larga está más distribuido como especie, la población de éste pudiera diferir de otras poblaciones y haber modificado se taxonomía debido a su aislamiento. Actualmente los riesgos de extinción de las especies de Pupo del Desierto y Charal de Aleta Larga en la región de Sonoyta se han incrementado considerablemente durante la última década; el cambio climático, el bombeo excesivo del agua, la contaminación del Río Sonoyta, la depredación de especies no nativas, fallas en el flujo de agua de los manantiales y posibles riesgos de contaminaciones biológicas o químicas son amenazas primordiales para éstas especies nativas de Sonoyta. Una de las propuestas para la conservación de éstas especies de peces fue la construcción de estanques refugios en diferentes puntos de la región del Río Sonoyta. Es por esto que se estableció un estanque refugio dentro de las instalaciones del Colegio de Bachilleres del Estado de Sonora Plantel Sonoyta con poblaciones del Pez Pupo del Desierto y Charal de Aleta Larga, mismos que fueron recolectados de las cuencas del Río Sonoyta para su protección. Además de la introducción de varias especies de plantas características de la región del Río Sonoyta. El estanque no solo está ayudando a la recuperación de las especies antes mencionadas, sino que también es utilizado como una herramienta en materia de conservación para educar a estudiantes y los habitantes en la importancia de preservar nuestros exóticos y raros recursos naturales del desierto. Actualmente los estudiantes del Colegio de Bachilleres del Estado de Sonora en coordinación con las autoridades escolares son los que llevan a cabo labores de mantenimiento y mejoras al estanque refugio el cual cuenta aproximadamente con 1,000 peces de ambas especies. Además de que este proyecto ha sido un esfuerzo conjunto entre instituciones como U.S. Fish and Wildlife Service, la Reserva de la Biósfera del Pinacate y Gran Desierto de Altar, CEDES, H. Ayuntamiento de Gral. Plutarco Elías Calles, Arizona Game and Fish Department, CEDO, Club de Leones “Sonoyta A.C.”, Caldwell Design, Organ Pipe Cactus National Monument, UofA, University of Arizona Cooperative Extension y estudiantes de Oregon State University Fish and Wildlife Club.

Wednesday 09 November 2011, CONTINUED

16:00-18:00 POSTER SESSION

Northwestern Mexico Area Report: current population status of some native fishes from the Baja California Peninsula

Ruiz -Campos, Gorgonio [1], Andreu-Soler, Asunción [2], Flores-Galván, Miguel A. [1], Solís-Carlos, Fernando [1], Camarena-Rosales, Faustino [1]. (1-Universidad Autonoma de Baja California, Facultad de Ciencias (Mexico), 2-Universidad de Mucia, Facultad de Biología (Spain)).

This report provides information on the current population status of four native fishes (*Cyprinodon macularius*, *Fundulus lima*, *Gasterosteus aculeatus* and *Oncorhynchus mykiss nelsoni*) in the Baja California Peninsula. The abundance of the desert pupfish (*C. macularius*) was monitored in the most important remnant population in Baja California (Cerro Prieto Geothermal ponds) in July 2010, March 2011 and September 2011. This population is still abundant and exhibits seasonal fluctuations in abundance by the dynamics of water levels that determine the availability of marginal habitats for colonization and dispersion among ponds. The CPUE (individuals/minnow-trap/hour) was 3.2 in July 2010, 0.96 in March 2011 and 4.05 in September 2011. On the other hand, the extirpation of Baja California killifish (*F. lima*) was confirmed for the populations of San Javier [mission] and Bebelamas drainages based on intensive sampling in June 2010. Respect to threespine stickleback (*G. aculeatus*), its abundance in the southernmost site of its distributional range (Río El Rosario) during November 2010 and March 2011, was 0.38 and 0.89 individuals/minnow-trap/hour, respectively. Fish sampling through the lower parts of the streams of northwestern Baja California during March 2011 revealed the rediscovery of the threespine stickleback in Río Cantamar (Médano). Finally, the population abundance of San Pedro Mártir rainbow trout (*O. mykiss nelsoni*) in the type locality was 22 individuals/200 meters of stream (September 2010), while in Arroyo San Rafael the abundance was 15 ind./200 meters of stream (January 2011).

El presente reporte ofrece información sobre el estatus actual de cuatro peces nativos (*Cyprinodon macularius*, (*Fundulus lima*, *Gasterosteus aculeatus* y *Oncorhynchus mykiss nelsoni*) en la península de Baja California. La abundancia del pez cachorrito del desierto (*C. macularius*) fue monitoreada en la población remanente más importante en Baja California (lagunas de la Geotérmica de Cerro Prieto) en Julio 2010, Marzo 2011 y Septiembre 2011. Esta población aún es abundante y exhibe fluctuaciones estacionales en abundancia debido a la dinámica de los niveles de inundación que determina la disponibilidad de hábitat litoral para colonización y dispersión entre las lagunas. La CPUE (individuos/trampa/hora) fue 3.2 en Julio 2010, 0.96 en Marzo 2011 y 4.05 en Septiembre 2011. Por otro lado, la extirpación de la sardinilla peninsular (*F. lima*) fue confirmada para las poblaciones de los drenajes de San Javier [misión] y Bebelamas basada en muestreos intensivos en Junio 2010. Referente al pez espino (*G. aculeatus*), su abundancia en la localidad más sureña de su ámbito de distribución (Río El Rosario) durante Noviembre 2010 y Marzo 2011, fue 0.38 y 0.89 individuos/trampa/hora, respectivamente. Muestreos de peces en las partes bajas de los arroyos del noroeste de Baja California durante Marzo 2011 reveló el redescubrimiento del pez espino en el Río Cantamar (El Médano). Finalmente, la abundancia poblacional de la trucha de San Pedro Mártir (*O. mykiss nelsoni*) en la localidad tipo fue 22 individuos/200 metros de arroyo (Septiembre 2010), mientras que en el Arroyo San Rafael la abundancia fue 15 ind./200 metros de arroyo (Enero 2011).

Refuge Center for Endangered Fish Species (CRPPE) Project: Conservation and Research of freshwater Mexican fishes.

Castillo Ontiveros, Yolanda [1], Valdés González, Arcadio [1], Ángeles Villeda, Mariaelena [1], Carreón Zapíain, María Teresa [1], Lira Morales, David Azael [1]. (1-FCB, UANL).

The main objective is the safeguarding, maintenance, reproduction and research of our native fishes that are in special position within or outside of Nuevo Leon. The "Refuge Center for Endangered Fish Species" (CRPPE) was born in the year 1986 within the premises of the Laboratory of Aquaculture (FCB, UANL), main program and axis of the aquaculture laboratory. In 2007 it obtained official permission to be registered as a Management Unit for Wildlife Conservation PVSNL-UMA-IN-0198-NL. Currently we host 43 species: 3 are probably extinct in wild, 23 endangered, 9 threatened, and 1 subject to special protection, according to Annex III of the Standards NOM-059-ECOL-2010. There are four fish families included in our program: Cyprinidae, Cyprinodontidae, Goodeidae and Poecilidae. The CRPPE contributes to the education of students, social service trainees, and graduate students, all of them learning about research, and some of them do their thesis work with us. It also has the support of volunteers connected to the aquarium such as hobbyists and associates from our state and abroad. Other activities carried out at the Center are: Studies on the biology and ecology of native fish; developing future conservation planning and strategies; possible reintroduction programs to their natural environment; nutritional analysis and diets for captive fish; gathering data on aspects of the biology and habitat requirements; studies on the impact of the introduction of exotic species into our environment; and in general all activities that contribute to knowledge of the fish fauna of our country.

El objetivo principal es el resguardo, mantenimiento, reproducción e investigación de los peces nativos, que se encuentren en situación especial dentro o fuera de Nuevo León. El “Centro de Resguardo para Peces en Peligro de Extinción” (CRPPE) nace en el año de 1986 dentro de las instalaciones del Laboratorio de Acuicultura (FCB, UANL), como proyecto central y eje del laboratorio. En el 2007 se obtiene el permiso para su registro como Unidad de Manejo para la Conservación de la Vida Silvestre PVSNL-UMA-IN-0198-NL. En la actualidad se resguardan 43 especies: 3 probablemente extintas en el medio silvestre, 23 en peligro de extinción, 9 amenazadas, y 1 sujeta a protección especial, de acuerdo al Anexo Normativo III de la NOM-059-ECOL-2010. Las familias incluidas en el programa son 4: Cyprinidae, Cyprinodontidae, Goodeidae y Poecilidae. El CRPPE contribuye en la formación de estudiantes, prestadores de servicio social, tesistas de licenciatura y posgrado, todos ellos aprendiendo sobre investigación y algunos haciendo su trabajo de tesis.También cuenta con el apoyo de personas voluntarias conectadas a los aficionados al acuarismo y a las asociaciones de nuestro estado y del extranjero.Otras actividades que se llevan a cabo en el Centro son: Estudios sobre la biología y ecología de los peces nativos, lo cual nos permitirá desarrollar en un futuro medidas y estrategias de conservación; programas de reintroducción a su medio natural; análisis nutricional y dietas para peces en cautiverio; recopilación de datos sobre los aspectos de la biología y requerimientos del hábitat; estudios sobre el impacto de la introducción de especies exóticas en nuestro medio; y en general todas aquellas actividades que contribuyan al conocimiento de la fauna íctica de nuestro país.

Research and monitoring efforts target recovery variables of the Devils Hole pupfish *Cyprinodon diabolis* and its ecosystem.

Wilson, Kevin [1], Gaines, Bailey [1], Goldstein, Jeffrey [1], Wullschleger, John [2]. (1-National Park Service, Death Valley National Park, 2-National Park Service, Fish Program).

The Devils Hole pupfish population began to decline in the mid-1990s and remains well below historic levels. Autumn adult counts from 2009, 2010, and 2011 were 125, 118, and 118, respectively; Spring adult counts for the same period were slightly lower or similar (2009 = 70, 2010 = 120, and 2011 = 104). Historically, counts ranged from 400 and 550 adults in the Autumn and from 200 to 300 in the Spring. Program staff from Death Valley National Park (DEVA), in cooperation with the US Fish and Wildlife Service (USFWS), Nevada Department of Wildlife (NDOW) and several academic institutions have been conducting research into ecological changes that may have contributed to reduced population size of the Devils hole pupfish. Hypotheses are driven by an ecosystem model and a Devils Hole population influence model. A Long Term Ecosystem Monitoring Plan (LTEMP) was implemented in August 2011 by DEVA staff following completion of peer-review and compliance. The LTEMP focuses on abiotic and biotic variables that influence ecosystem processes and composition. Development of a thermodynamics model was initiated in winter 2009by the University of Nevada Reno (UNR). This model is based on data from fiber-optic cables that measure temperatures vertically to a depth of 40 meters and over the shallow shelf. These data will be used to answer questions related to the relationship between water temperature, water level and climate change. A metabolism/nutrient/ecosystem production study started in August 2011 by Ball State University (BSU). This project is using microelectrode technology to measure hydrogen sulfide (H2S), dissolved oxygen (DO), pH, and temperature (°C) in dominant biofilms found in Devils Hole. to investigate the effects of the increased presence of the bacterium Beggiatoa sp. This bacterium has filaments that contain elemental sulfur which removes dissolved oxygen from the sediment-water interface. Reduction in DO could ultimately reduce egg hatching success of pupfish. A Devils Hole pupfish population-modeling project through Iowa State University is nearing completion. The population model is incorporating data collected from early-life Stage (fish larvae) monitoring, a length-frequency study using stereo-video, and adult counts. Using both applied and basic research should provide managers with data to make informed recovery decisions for the Devils Hole pupfish and its ecosystem.

Fishes of Texas Project – compilation and standardization of museum-vouchered fish collection data, online database, and related research

Hendrickson, Dean A. [1], Cohen, Adam E. [1], Labay, Ben [1], Martin, F. Douglas [1], Sarkar, Sahotra [2], Sissel, Blake [2], Harrison, Jeremy [1], Casares, Melissa [1]. (1-University of Texas Austin, Texas Natural Science Center, 2-University of Texas Austin, Section of Integrative Biology).

We documented spatial and temporal distributions of Texas' freshwater fishes by compiling museum specimen occurrence records from 33 institutions. The resulting 81,218 records include nearly all of the approximately 280 species found in Texas at 5,729 total localities sampled by 10,954 discrete collecting events from 1854 to 2009. Precise manual georeferencing of 87% of records (with estimates of placement error) facilitated discovery of probable identification errors via mapping and flagging of geographic outliers, then identification verification by specimen inspection. In some collections up to 70% of flagged records proved misidentified. Looking beyond records suspected on the basis of location to be mis-identified, we examined all 9,000 specimens of 15 species held in one collection and found mis-identification rates > 20% for 7 species, emphasizing that unvouchered observations should always be interpreted cautiously. Corrections of locations and identifications resulted in 36 new occurrence records of 25 species in major river basins from which they had not been previously recorded. The database continues to improve. In the last year we added data from 7 more institutions, greatly accelerated cataloging of backlogged specimens at Texas Natural History Collection, and acquired previously uncataloged specimens from other collections. Once georeferenced and added in phase 2, these new data will increase total occurrence records to > 103,000 (=27%growth). Scans of collectors' fieldnotes are linked to the records, as is an extensive gallery of fish images. Species Distribution Models (=Ecological Niche Models) that we have generated (using Maxent) from these data for the majority of Texas' species are accurate predictors of distributions and useful for research and management. We are also using them in explorations of faunal reactions to future climate scenarios and in computerized conservation network planning incorporating climate change and socio-economic data. A new, interactive, extensively illustrated identification key is in development, as are species accounts that link dynamically to independent online sources of knowledge about Texas' species and habitats. We invite potential users to explore www.fishesoftexas.org and to help improve the site by commenting and uploading additional photos, fieldnotes, etc. We hope all who collect fishes voucher their collections in collections that contribute data to this resource.

Current Outlook of the Churince, Cuatrociénegas, Coahuila

Hector S. Espinosa Perez[1], Villalobos S. Eduardo[1], Sepúlveda J. Daniel[1], Lambarri M.[1], Christian and Hernández M. Ariana[1]. (1-Coleccion Nacional De Peces Instituto De Biologia, Unam Ciudad Universitaria**).**

Churince, at Cuatrociénegas, Coahuila is a small area with relatively small productivity in the desert. Five years ago, this aquifer system arose as a spring and formed several well filled waterways and pools that fell into an intermediate lagoon and finally into a larger lagoon. Unfortunately, Churince is suffering a serious decrease in water (especially since 2006) that is causing its disappearance. Now, the system consists only of the spring, some waterways and semi-dry pools and the intermediate lagoon, all of them with depleted water levels. At present there are many research groups involved in the study of the ecosystem, all of them collaborating with the local communities, in order to protect and preserve the area. The decline of the Churince system because of the water depletion of the entire Cuatrociénegas system also leads to the decline or loss of several endemic species and the loss of a treasured and unique landscape.

Safe Harbor Agreement for topminnows and pupfish in Arizona: Where are we now?

Timmons, Ross [1]. (1-Arizona Game and Fish Department).

In 2008, the Arizona Game and Fish Department (AGFD) entered into a Safe Harbor Agreement (SHA) with the U.S. Fish and Wildlife Service for the management of four endangered native fishes, the Gila topminnow, *Poeciliopsis occidentalis occidentalis*, Yaqui topminnow, *P. o. sonoriensis*, desert pupfish, *Cyprinodon macularius*, and Sonoyta pupfish, *C. eremus*. The SHA provides an instrument for the State to enroll state, county, municipal, and private, non-Federal bodies of water for the purposes of conserving these species. Soon after it was completed, interest in the SHA was high, and it was decided to prioritize larger, high quality habitats, due to their stability and potential to produce large populations, and perhaps as importantly, due to limited manpower and monitoring obligations incurred with the enrollment of each site. Currently, over 20 ponds of various sizes have been enrolled, and interest in the program remains high, with as many sites in various stages of the enrollment process. One group of private land owner that continues to show strong interest in the program is the small backyard pond owner in urban and suburban neighborhoods. Individuals with small backyard ponds are interested in native species for several reasons, including a desire to help with the conservation of local native species, and a desire to use native rather than exotic species as a source of vector control. Several alternatives are currently under consideration to address the needs of urban backyard pond owners.

En 2008, el Arizona Game and Fish Department (AGFD) entró en un Acuerdo de Refugio Seguro (SHA) con el EE.UU. Fish and Wildlife Service para la gestión de cuatro peces en peligro de extinción nativos, el topminnow de Gila, *Poeciliopsis occidentalis occidentalis*, Yaqui topminnow, *P. o. sonoriensis*, mojarras de zonas desérticas, *Cyprinodon macularius*, y Sonoyta cachorrito, *C. eremus*. El SHA proporciona un instrumento para el estado de inscribir cuerpos de agua estatales, de condado, municipales, privados y no federales con fines de conservación de estas especies. Poco después de que se terminó, el interés en el SHA fue alto, y se decidió dar prioridad a los hábitats mayores de alta calidad, debido a su estabilidad y su potencial para producir grandes poblaciones, y quizás igual de importante, debido a los limitados recursos humanos y las obligaciones de supervisión incurridos con la inscripción de cada sitio. En la actualidad, más de 20 lagunas de diversos tamaños se han inscrito, y el interés en el programa sigue siendo alto, con sitios en diversas etapas del proceso de inscripción. Un grupo de propietarios de tierras privadas que sigue mostrando un gran interés en el programa es el dueño del patio trasero con un pequeño estanque en los barrios urbanos y suburbanos. Las personas con estanques de jardín pequeño están interesadas en las especies nativas por varias razones, incluyendo el deseo de ayudar a la conservación de especies nativas locales, y el deseo de usar especies nativas en lugar de especies exóticas como fuente de control de vectores. Varias alternativas se están estudiando para hacer frente a las necesidades de los propietarios urbanos de estanques de patio trasero.

Thursday 10 November 2011

GENERAL SESSION 4: Moderator— Melissa Trammell

09:15 **Dead spring flowing: Witnessing death of the Churince system**

Carson, Evan W. [1]. (1-Department of Biology, University of New Mexico).

The Churince system was formerly a microcosm of the biotic and habitat diversity in the Cuatro Cienegas basin, Mexico. At ~3km long, Churince contained a headspring, rio, marshes, intermediate laguna, a diversity of peripheral habitats, and an expansive, terminal lake (Laguna Grande). Most but not all of the basin's endemic and native fishes are known from this system, though at least two species appear extirpated due to recent deterioration of this system. Slow decline of Churince began after the mid-1960's construction of Becerra irrigation canal; however, more recent, high volume groundwater water extraction in the adjacent Hundido Valley led to exceedingly rapid decline of Churince and at least one other system (to date) in the western basin. Photo-documentation that records transition from a vibrant system to effective loss will frame discussion.

09:30 **Seasonal distribution of native fishes of San Bernardino Creek**

Minckley, C.O. [1]. (1-Cuenca de los Ojos A. C.**).**

San Bernardino Creek is a northern tributary of the Yaqui River. Originating in the United States it crosses the Southern International Border just east of Douglas, AZ/Agua Prieta, Sonora, México, immediately south of the San Benardino/Leslie Canyon National Wildlife Refuge. The Yaqui River fishes occur in this system, and include minnows, a sucker, and a poeciliid. Information is presented on the seasonal distribution of these fishes during 2008 – 2011 and on the distribution of the Mexican chub, *Gila minacae*. A population estimate for the Yaqui chub, *G. purpurea* is presented. Also, a brief history of the area is given and the subsequent use of gabion construction to improve this stream during the last 3 decades is discussed.

09:45 **Humpback chub translocations in Grand Canyon National Park**

Trammell, Melissa [1], Healy, Brian [1], Omana Smith, Emily [1], Spurgeon, Jon [2]. (1-National Park Service, 2-University of Missouri Columbia).

The National Park Service partnered with the Arizona Game and Fish Department, Bureau of Reclamation, U. S. Fish and Wildlife Service, and the Museum of Northern Arizona to translocate endangered humpback chub *Gila cypha*, into Shinumo Creek in Grand Canyon National Park. Three hundred humpback chub originally collected from the Little Colorado River were released into Shinumo Creek each year from 2009 to 2011. In 2011, the first translocation of humpback chub in Havasu Creek was also made. About 240 humpback chub were released into Havasu Creek just below Beaver Falls. Prior to release, eight unique resident humpback chub were captured in Havasu Creek, the first to be found in several decades. Nonnative fish removal and fish community monitoring were conducted before and after each release. Humpback chub in Shinumo Creek continue to survive, be retained in the creek, and exhibit growth rates comparable to the Little Colorado River and hatcheries.

10:00 **Devils Hole Pupfish Interagency Team Update to the Desert Fishes Council**

Simons, Lee [1], Sjoberg, Jon [2], Wullschleger, John [3]. (1-U.S. Fish and Wildlife Service, 2-Nevada Department of Wildlfe, 3-National Park Service).

The only population of the Devils Hole pupfish (Cyprinodon diabolis) has been in decline or subsisting at low levels for more than a decade. Biannual counts for the last three years (2009 – 2011) suggest that numbers have risen above the historic low point but may no longer be increasing. We discuss management options in light of hypotheses regarding the ecological factors that may be limiting population size and risks associated with various alternative actions. We also provide updates on ongoing research, monitoring and management activities.

10:15 **Upper Colorado Basin Area Report**

Wilson, Krissy [1], Breen, Matthew J. [1]. (1-Utah Div. Wildlife Resources).

Activities continue in an effort to improve the status of many of the native fishes of the Upper Colorado River Basin. These activities are guided principally by four programs: the Upper Colorado River Endangered Fish Recovery Program (UCRRP), the San Juan River Basin Recovery Implementation Program, the range-wide Conservation Agreement for the Colorado River cutthroat trout, *Oncorhynchus clarkii pleuriticus*, and the Range-wide Conservation Agreement and Strategy for the roundtail chub, *Gila robusta*, bluehead sucker, *Catostomus discobolus*, and flannelmouth sucker, *C. latipinnis*. The two recovery programs, which work specifically towards recovery of the Colorado pikeminnow, *Ptychocheilus lucius*, razorback sucker, *Xyrauchen texanus*, bonytail, *G. elegans*, and humpback chub, *G. cypha*, use the protection of instream flow, habitat restoration, nonnative fish control, propagation, life history monitoring, and information and education to bring benefits to the four big river fishes. Examples of recent efforts include continued research into the use of floodplain habitats by razorback sucker and bonytail and increased effort towards removal of problematic nonnative species. Renovation of rainbow trout streams and reintroduction of the Colorado River cutthroat trout continues in Colorado, Utah, and Wyoming. Additional locations continue to be targeted for barrier placement and cutthroat reintroduction. Research into the movement and life history needs of the roundtail chub, bluehead sucker, and flannelmouth sucker continues in many locations in the upper basin.

10:30 – 10:45 BREAK

GENERAL SESSION 5: Moderator— Krissy Wilson

10:45 **An evaluation of liquid ammonia as a new candidate piscicide**

Ward, David L [1]. (1-US Geological Survey).

The continued decline of native fish in the southwestern United States is largely attributed to interactions with introduced fish species. Attempts to remove nonnative fish from areas with native fish are common, but success is limited because very few tools are available for managing invasive aquatic species. Currently licensed piscicides such as Rotenone are likely to become unpopular because of recent data linking Parkinson's disease to Rotenone use in agriculture. This creates the need to evaluate new chemicals that could be used as management tools for native fish conservation. At high concentrations, ammonia is known to be toxic to a wide variety of aquatic organisms and yet ammonia is the natural byproduct of fish metabolism and is naturally present in the environment at low levels. Natural bacteria in the environment rapidly convert ammonia to non-toxic nitrate. A suite of common nonnative fishes including smallmouth bass *Micropterus dolomieu*, largemouth bass *Micropterus salmoides*, green sunfish *Lepomis cyanellus*, fathead minnow *Pimephales promelas*, red shiner *Cyprinella lutrensis*, mosquitofish *Gambusia affinis*, black bullhead *Ameiurus melas*, channel catfish *Ictalurus punctatus*, flathead catfish *Pylodictis olivaris*, bullfrog tadpoles *Rana catesbeiana*, and crayfish *Orconectes virilis* were introduced into two experimental outdoor ponds located at the Rocky Mountain Research Station in Flagstaff, AZ. Each pond was treated with ammonium hydroxide (29%) at 0.5 ml of ammonia per gallon of water. Water quality was monitored for 30 days to determine how fast the natural bacteria in the environment converted the ammonia to non-toxic nitrate. After 30-days all water in both ponds were drained and no fish, crayfish or tadpoles were found to have survived the treatment, but red ear slider turtles *Trachemys scripta* and hatchling mud turtles *kinosternon baurii* remained alive and appeared unaffected.

11:00 **Nevada Area Report**

Miskow, Eric [1], Weissenfluh, Darrick [2], Peterson, Jeff [3], Wright, Karie [3], Mellison, Chad [2], Syzdek, David [4], Goodchild, Shawn [5]. (1-Nevada Natural Heritage Program, 2-U.S. Fish and Wildlife Service, 3-Nevada Department of Wildlife, 4-Southern Nevada Water Authority, 5-North Dakota State University).

A summary, overview and status of Nevada's desert fishes, current research and management projects in the state are addressed. Nevada waters contain 16 endangered and 6 threatened species of fishes as well as numerous undescribed taxa. In southern Nevada ongoing habitat modifications and restoration projects in the Muddy River Warm Springs complex continue to increase suitable habitat for the endangered Moapa dace, *Moapa coriacea* in addition, semi- annual dace counts reveal that there has been a 54% increase in the population since the 2008 February low. An additional rotenone treatment is scheduled for late 2011 to further reduce the invasive blue tilapia, *Oreochromis aureus*. In far eastern Nevada, remnant populations of the relict dace, *Relictus solitarius*, are being genetically analyzed in preparation for a rehab project eliminating several ponds creating more stream-like habitat in the southern portion of the Ruby Valley National Wildlife Refuge. The creation of more suitable habitat as well as a rotenone application for removal of non-natives and relict dace/speckled dace, *Rhinichthys osculus ssp*. hybrids is scheduled for early autumn. Habitat for the undescribed Wall Canyon sucker, *Catostomus sp.* in northeastern Nevada is receiving funding from the Desert Fish Habitat Partnership to work toward the design and construction of a barrier site on Mt. View Creek, a tributary of Wall Canyon Creek. Non-native brown trout, *Salmo trutta* as well as signal crayfish, *Pacifastacus leniusculus*, continue to heavily impact the Wall Canyon sucker. One of the two remaining pluvial lakes from ancient Lake Lahontan is Walker Lake, sister lake to Pyramid Lake. Upstream water diversions of the Walker River began in the early 1900's, since this time the lakes surface level has dropped by over 150 feet. Salinity levels have increased to a lethal level for all native fishes of over 19,000 mg/L. This has decimated the fishery to the extent that the native Lahontan tui chubs, *Siphateles bicolor pectinifer* and *S. b. obesa* have failed to spawn, further compromising the fishery. A refuge was constructed at Rose Creek Reservoir in the Walker Lake basin in hopes of maintaining a viable population of Lahontan tui chub until further water appropriations and management actions by the Walker Lake Fisheries Improvement Team can be met. The restoration of North and South Indian springs in Ash Meadows National Wildlife Refuge began in 2009 and was completed in Spring 2011. Post-restoration effectiveness monitoring indicates red swamp crayfish, *Procambarus clarkii*, and western mosquitofish, *Gambusia affinis*, were successfully eradicated during the project. Endangered Warm Springs pupfish, *Cyprinodon nevadensis pectoralis*, have been reintroduced and monitoring has confirmed the population has more than doubled from its pre-restoration numbers. Additionally, four endemic aquatic invertebrates, all of which were extirpated prior to restoration activities (most likely by *P. clarkii*), have been recently repatriated. The Upper Carson Slough (UCS) includes Fairbanks, Soda, Rogers, Longstreet, Five, and Cold springs and is located downstream of a 385 square-mile drainage basin. Restoration of the Fairbanks (Phase 1) and Soda springs streams was completed in 2010. Phase 2 of the Fairbanks Spring stream restoration was completed in Spring 2011. Post-restoration monitoring indicates the population of endangered Ash Meadows speckled dace, *Rhinichthys osculus nevadensis*, introduced into the restored Phase 1 Fairbanks Spring stream in 2010, is stable and has expanded its range into the Phase 2 stream. The endangered Ash Meadows Amargosa pupfish, *Cyprinodon nevadensis mionectes*, is thriving throughout the restored outflow channel and the endemic Fairbanks springsnail, *Pyrgulopsis fairbanksensis*, has a slightly expanded range in the Fairbanks stream. The outflow streams of Rogers and Longstreet springs connect to the Fairbanks stream. The only population of non-native sailfin molly, *Poecilia latipinna*, occurring in the UCS was in Longstreet Spring and its outflow; that population was successfully eradicated in February 2011. In addition to these species updates, restoration efforts in Railroad Valley for the Threatened Railroad Valley springfish, *Crenichthys nevadae*, and the Endangered Clover Valley speckled dace, *Rhinichthys osculus oligoporus* will be discussed.

11:15 **Native fish conservation and management in the Upper/Middle Rio Grande, Pecos River, Canadian River, Tularosa and Guzman basins, New Mexico during 2011.**

Carson, E. W. [1], Remshardt, W. J. [2], Davenport, S.R. [2], Dudley, R.K. [3], Platania, S.P. [3], Monié, A. [4]. (1-University of New Mexico, 2-US Fish and Wildlife Service, 3-American Southwest Ichthyological Researchers, 4-New Mexico Department of Game and Fish).

Native fish conservation in New Mexico is accomplished through long term monitoring of protected species, captive propagation, stream restoration, and interagency water management. Long term monitoring and research programs track many rare native desert fishes including Pecos pupfish (*Cyprinodon pecosensis*), Rio Grande silvery minnow (*Hybognathus amarus*) in the Rio Grande, New Mexico, and Pecos bluntnose shiner (*Notropis simus pecosensis*) in the Pecos River, New Mexico. The year 2011 can be generalized as a drier than average year and subsequently resulted in lower flows which negatively impacted native species. Further, prolonged low flows and river intermittency likely threatened all life stages in a variety of ways (e.g., desiccation, reduced resource availability, stress). Annual monitoring of the Pecos pupfish was done in core habitats in New Mexico following the finalization of the Pecos pupfish monitoring plan. Pecos pupfish were sampled at 13 sites in the Pecos River drainage of New Mexico from 11 – 15 April 2011. A total of 30,182 Pecos pupfish were sampled using between 20 and 40 traps at each site. USFWS, BLM, NM State Land Office, NM State Parks, and NMDGF participated in the monitoring. Multiple research and monitoring projects for Rio Grande silvery minnow continued in 2011 including population monitoring, population estimation, reproductive monitoring, and fish passage monitoring. Fall surveys are used to determine annual trends in abundance and distribution. The most recent survey data available is from October 2010. Rio Grande silvery minnow was collected in low numbers at the 20 sampling sites during October 2010 (N=137; 12,080.2 m2). This species comprised 3.5% of the total catch and was present in 63 of the 299 (21.1%) seine hauls that yielded any fish. Rio Grande silvery minnow was present at 15 of 20 localities. Population monitoring efforts demonstrated that Rio Grande silvery minnow density in October was significantly lower ($p<0.05$) in 2010 than in recent years (e.g., 2007, 2008, and 2009) but that it was significantly higher ($p<0.05$) than in 2002 and 2003. Reach-specific population estimates of Rio Grande silvery minnow in 2010 were highest in the Isleta Reach (N = 137,486) and lowest in the San Acacia Reach (N = 49,319). The standard errors associated with population estimates for the three reaches were proportionally comparable for the Isleta and San Acacia reaches; standard error was notably higher in the Angostura Reach. The overall population estimate was 267,272 and had a standard error [SE] of 99,338. The overall population estimate for age-0 (N = 115,166) Rio Grande silvery minnow was not significantly higher than for age-1 (N = 112,387) individuals. United States Fish and Wildlife Service (USFWS) continued monitoring of a rock channel fish passageway in 2011 for Rio Grande silvery minnow. PIT-tagged Rio Grande silvery minnow were released at various locations upstream and downstream of the passage in 2011. To determine if Rio Grande silvery minnow would use in-stream fish passageways, we implanted 6,657 Rio Grande silvery minnows with PIT tags and a used passive scanning station to document movements from seven release locations, up to 19.7 km upstream and 13.5 km downstream of the fish passage, and to document successful ascension of an in-stream rock channel fish passageway on the Rio Grande, Albuquerque, New Mexico. Between 18 March, one week after release, and 21 August 2011, 157 individuals were detected (2.4% of total), with 61.1% fish detected upstream release sites and 39.9% from downstream release sites.

11:30 **Topminnow vs. mosquitofish: An update**

Duncan, Douglas K. [1].).

It has long been known, and thoroughly illustrated in the literature that the western mosquitofish, *Gambusia affinis*, has major deleterious effects on individual Gila topminnow, *Poeciliopsis occidentalis*, and their populations. It has been many years since information on this negative impact has been published in the literature. Therefore, I will list and discuss additional examples where mosquitofish have impacted topminnow. In addition, it appears that climate change and long-term drought have a synergistic and negative affect on this relationship. Since the last publications detailing the loss of Gila topminnow populations to mosquitofish, two natural topminnow populations have been lost in the Santa Cruz River basin: Redrock Canyon and Sheehy Spring. Drought and climate change likely assisted mosquitofish with extirpating these two natural populations. Lastly, climate change may facilitate expanded mosquito populations or expanded mosquito seasons within the range of the Gila topminnow. It has also been discussed in the literature that existing tropical and subtropical diseases, or novel diseases, may move north into current Gila topminnow range. If mosquitoes and diseases they carry become more prevalent, the desire and demand for vector control, particularly mosquitofish, will increase. I will discuss tools and programs such as Habitat Conservation Plans and Safe Harbor Agreements that can allow the use of native fish for vector control.

11:45 - 14:00 LUNCH

14:00 - 16:00 OPEN DISCUSSIONS

16:00 - 17:30 BUSINESS MEETING

18:00 - Open BANQUET

Friday 11 November 2011
OPEN

Saturday 12 November 2011

08:00 - 17:00 FIELD TRIP