

**NONNATIVE FISH MANAGEMENT WORKSHOP: 2008**  
**Draft Summary**  
**December 9–10, 2008**  
**Grand Junction, Colorado**

**Purpose of Workshop.**—Provide a forum for principal investigators of nonnative fish management projects and other interested parties to: a) discuss issues related to the Recovery Program’s ability to reduce the threat of nonnative fishes; and b) collaborate on data presentations that synthesize results from 2008 and previous years.

**Expected Outcomes:**

1. Clear direction on the types of analyses needed for three collaborative presentations to be given at the Annual Researcher’s Meeting in Grand Junction, Colorado, on January 13-14, 2008. These presentations will synthesize field data collected during 2008 and previous years as they relate to: a) smallmouth bass management; b) northern pike management; and c) native fishes responses to those management actions.
2. Recommendations, with justification, to the Biology and Management Committees on how the Recovery Program could more effectively reduce the threat of nonnative fish in 2009 and out-years. (We should strive to roll these recommendations into the collaborative presentations.)

**WORKSHOP SUMMARY**

**TUESDAY, DECEMBER 9**

1. **Introduction:** Workshop purpose and desired outcome; introductions (Attachment 1).
2. **Open Discussion**
  - Gear efficiency, e.g., VVP vs GPP – Tom Chart discussed proposals from the field to switch from GPP 5.0 to VVP-15B electrofishers. Tom recalled that Pat Martinez and Larry Kolz are implementing a [scope of work in place to standardize our current hard-bottomed boat fleet](#) (with GPP 5.0 electrofishers). This work is helping us determine how to get the most out of this configuration and the PD’s office would like to stay the course with the GPP’s and implement the recommendations that Pat Martinez and Larry Kolz have made. John Hawkins said their Coffelt unit sometimes seems to out-perform their Smith-Root GPP 5.0. Cameron said he reviewed what small amount of comparative data they have and it showed the Coffelt caught 9 bass/hour and the Smith-Root 7 bass/hour. They’ve had a gut feeling that they often catch more fish with the Coffelt. Anita countered that she and Lori Martin have seen dramatically different catch rates on opposite sides of the river with identical equipment. In addition to the type of unit used, many, many variables affect electrofishing efficiency, including: crew experience; netter strength, size, and enthusiasm; habitat structure, fish density, anode configuration,

cleanliness of the boat hull, temperature, and more. Pat Martinez gave a short presentation on the electrofishing standardization work (see Attachment 2). Current research and evaluation on electrofishers is on GPP units. Pat proposes to test external meters this year (units will be set to avoid tetany or mortality, output and conductivity will be measured), and then may recommend external meters for all boats in the fleet. Pat and others noted that collecting permits need to be updated to reflect the current GPP technology. John Hawkins suggested that someone should evaluate the new Smith-Root VVP unit. Before meaningful field information could be collected, Larry and Pat would need to test the wave-form with an oscilloscope with the boat in dry-dock. The group discussed potential VVP testing and the unique conditions on the Yampa River at some length. **The group agreed with Pat's recommendation to standardize anode sphere size (to 9", with the >PD's office facilitating the order) and anode spacing on all hard bottom boats this year and to put external meters on 4 boats (2 in Utah and 2 in Colorado). >The PD's office will work with Pat & Larry to develop other operational recommendations. >Pat and Larry will discuss the VVP and its future availability with Smith-Root (and its comparability to the old Coffelt VVP), test a VVP in dry-dock (after which Cameron will test the S-R VVP-15B in 2010). Meanwhile, in 2009, Cameron will continue to use the Coffelt VVP and gather comparative (Coffelt vs S-R GPP) catch rate data. >Dave Speas will send Cameron a suggested comparative study design.**

- 2<sup>nd</sup> level synthesis (see summary of the Nonnative Fish Subcommittee's (NNFSC) November 3, 2008, conference call.) – Tom Chart said we hope to get an RFP out in early 2009. The proposed approach will likely identify data gaps (e.g., age/growth; predation rates; rates of recruitment). Dave Speas recommended the RFP not focus only on the Haines-Modde model.
- Data files — Because the NNFSC will recommend that the 2<sup>nd</sup> level synthesis include 2008 data, we'll need an estimate of when PI's can submit their 2008 data files to Chuck and Travis. The degree of "standardization" in the 1<sup>st</sup> round of data submittals (2004–2007) varied greatly. Travis said we're very close to having complete datasets through 2007. Travis will not have the time to clean up anyone's 2008 data, so it's critical that 2008 data submittals follow the standard format and that **>PI's will submit their 2008 data NO LATER THAN MARCH 1, 2009**. Are all of the SMB and NP captures from other studies also being submitted to Chuck and Travis? Some data have been submitted, but Travis doesn't know if everything is being submitted. >PI's will make sure they are submitting complete, inclusive data sets to Travis. Bill Atkinson emphasized the importance of including data on other native fish abundance can help answer questions regarding whether our removal efforts are having a positive effect on native fishes (especially, for example, on the Colorado River, where there isn't a native fish response study). Melissa suggested that we need a master native fish database in addition to the RARE database.
- Other Nonnative Species, e.g., walleye (should we be more concerned?); channel catfish (Vernal CRFP, and perhaps Moab UDWR, are not removing channel catfish in Whirlpool / Island Pk / Split Mtn Canyon. In 2008, and possibly previous years, crews could have

been removing a lot of channel catfish with negligible effect on SMB removal). With regard to walleye, Paul Badame said he's seen a substantial increase (still only seeing adults); Trina said they've also seen an increase. Trina noted they caught most walleye *before* Starvation Reservoir spilled (Red Fleet Reservoir is another potential source). Tom Chart will make sure the isotope study is getting fish from all the reservoirs in the Duchesne drainage. Bob Burdick said walleye captures are only incidental in the Colorado River. All walleye captured are being removed. With regard to channel catfish in Echo Park-Island Park – Split Mtn., are we missing an opportunity (especially when very few bass are being caught)? Trina said she thinks UDWR would support this if there's a sound argument that it might help native fishes. Tildon Jones indicated that the increased number of passes we're doing now would represent significantly greater effort than what was expended for catfish removal in the past. Smallmouth bass removal would remain the priority, so smallmouth removal would not be compromised. Trina said permit changes would be needed, and perhaps some additional public relations work; she will raise this proposal within UDWR. Tildon noted there's less angling within Dinosaur, so it might be more palatable there. > **Vernal CRFP will work with UDWR to incorporate an experimental channel catfish removal aspect into Project 123a.** Cameron raised the possibility of white sucker and carp removal in the Yampa River. Carp removal has been successful in the San Juan and white suckers are a threat to native suckers. Again, smallmouth bass removal would remain the priority. Little Yampa Canyon might be the best place to try. Trina said Utah has been removing white suckers (to prevent hybridization with native suckers, including razorback suckers); their measure of success is to keep white sucker average total length below 275 mm (sexual maturity). Cameron would like to explore pilot removal of carp and white sucker in Little Yampa Canyon. >**The PD's office will work with LFL and CDOW on a proposal in Little Yampa Canyon for CDOW's consideration.** Kevin Bestgen cautioned that changing another aspect will affect our ability to interpret results in the experimental control/treatment reach. Anita said white sucker removal would reduce their effort for smallmouth bass on the Colorado River. Carp removal might find angler favor in the Grand Valley, but both Anita and Bob Burdick agreed that removing white suckers or carp would create a disposal problem. Pat Martinez emphasized a food web perspective, noting that we may be making a big mistake by overlooking nonnative invertebrates in the system (crayfish). Also, we don't know how establishment of gizzard shad may affect a large cyprinid like Colorado pikeminnow (they are known to be detrimental to salmonids due to their high levels of thiaminase, an enzyme that destroys thiamine).

- Review the NNFSC's attempt to prioritize recommendations from past nonnative fish workshops (Not discussed at the workshop - document posted to listserver; provide comments through your Biology Committee member).

### 3. Collaborative Presentations (Attachment 3)

- a. Native Fish Responses to Nonnative Fish Management (Lead: Kevin Bestgen and the PD's office) – Kevin Bestgen reviewed data collected on the Yampa River from 2003-2008 and Matt Breen gave an overview of the middle Green River 1986 – 2008 dataset he's begun to look at. No removal effects have yet been demonstrated in the

Yampa or Green river native fish response studies. Trina, Tildon, and Leisa discussed a proposal to remove nonnatives from middle Green River backwaters and then block the backwaters off with nets to prevent nonnative entry and improve pikeminnow survival. One question is whether any significant number of pikeminnow larvae make it through the “gauntlet of mouths” to reach the backwaters (we know the larvae are in the drift for the first ~17 miles).

### WEDNESDAY, DECEMBER 10

#### b. Smallmouth Bass (Lead: Paul Badame and the PD’s office).

##### SMB presentation information for Paul:

- 2008 Yampa sampling map
- Break adults and juveniles at 200 mm; extend this analysis back to ‘04
- Account for exploitation (perhaps on the map that shows #fish/mile & #fish/hour)
- Relate to exploitation to the interim criteria of 30 fish / mile (the group recognized that this metric was based on Rick Anderson’s classification of SMB >150mm)
- Compare SMB size structure longitudinally (South Beach on the Yampa down through Uintah Basin); consider how this varies through time; how it is affected by flow/temp. PI’s need to work with Paul to determine the most appropriate time of the year to focus on and *then break out in 25mm increments from 0-525mm* and present as relative (percent) frequency. Consider a separate analysis for young fish.
- Explain how the sampling effort has increased through time; preferably on the maps.
- Show % of population removed on each pass (Bruce); calculate probability of capture
- Perhaps calculate estimate of exploitation 3 different ways (or at least 2: percent of point est., percent of tagged fish removed)
- The group recognized that not all PI’s have (or needed to) correct for recruitment through the sampling season – where available present catch corrected for recruitment.
- Kevin Bestgen offered that he and Gary White could take data over all passes, throw in recapture rate, then look at turbidity covariate, which might explain differences between exploitation rates (% of the pop est removed vs % of tagged fish removed)
- *PI’s need to provide Paul with specific dates of mark and removal passes by project*
- Colorado R. – info from Burdick for map
- Characterize movement of fish tagged in Little Yampa Canyon (among and within years), because we have several years of sampling in contiguous reaches up – and downstream. Among and within years for Little Yampa Canyon. (Chart lead w NNFSC)
- Add recommendations to presentations.
- Longitudinal distribution of SMB (some measure of density) by year from Yampa through Green; e.g., #/pass/10-mi bracket.
- *CDOW still needs to submit measures of exploitation for project 98a.*
- Roll 98b data into longitudinal distribution.

## Modifications for '09 and beyond

- Sample Green R. in April to determine if adult bass are more susceptible. Bass may shock sluggish – look behind boat.
- Sampling boundaries don't represent population boundaries. Expand removal in project 98a to include Yampa River miles 100-90.
- Consider applying NP approach (coordinate sampling schedules across Projects to allow for more robust data analysis) to SMB in Yampa: at least from RM 134 downstream thru Lily Park. PI's recognized the need to mark more fish – consider shifting the marking effort to the third pass or whenever past catch rates have been greatest. CO has insisted on first pass marking in the past, therefore this needs to be approved by them. **>Group recommended expanding SMB removal throughout YR critical habitat.**
- Maybe CDOW could get out on Yampa earlier (consider using Elkhead Res. releases to benefit sampling conditions?)
- Cross Mtn. – ~ 3-mile section sampled via angling, but doesn't seem worth the effort; netting won't work. Could consider tagging as many fish as possible angling. **>Group agreed to discontinue nonnative fish removal in Cross Mtn canyon for now.**
- Yampa Canyon – perhaps add a pass(es) before the peak. **> Add an April removal pass then repeat the 2008 protocol, including the pop. est.**
- Project 123b – change tagging pass to pass 3. Re: tag retention study, recommend using old pit tags if available instead of fin clips (crew doesn't reliably look for fin clip). Aaron suggested incorporating a hole-punch to the caudal fin because it's so obvious.
- **Project 154 – > the group agreed to discontinue Desolation Canyon removal, but continue monitoring the Ouray to Sand Wash reach. Also, continue Duchesne removal, because it is a potential source of smb to the Green River** (requires continued coordination with Jay Groves). Tom Chart suggested that we consider the Duchesne River as a potential site for flow manipulation to disadvantage SMB.
- Project 126 – Colorado River largemouth bass remain a concern, but no changes recommended. Assessment of the fish community (particularly small-bodied fish) would be informative. (CDOW considering repeating R. Anderson's work.) **>Bob Burdick and the group considering reducing the # of removal passes based on the reduction in SMB catch rates, but agreed to maintain current levels because of the lmb issue.**

c. Northern Pike (Lead: Boyd Wright and the PD's office).

### NP presentation information for Boyd:

- Aaron will provide corrected 2008 NP dataset to Billy Atkinson.

## Modifications for '09 and beyond

- **>Combine the NP datasets from Projects 98a and 98b / 125 for more robust analysis.**
- Backwater @ RM 151 continues to be problematic and is a likely source of NP spawning. CDOW & BOR continue to communicate with the landowner and investigate options to disconnect the habitat from the river.
- The group discussed the need to expand NP removal efforts upstream of Hayden, CO. CDOW needs to provide an update of ongoing and planned future efforts to control NP in the Upper Yampa River prior to Upper Basin Researcher's Mtg in Jan., 2009.
- Synchronize passes b/tw agencies

**4. Wrap-up:**

- a.** Review conclusions/recommendations from the open discussion the previous day.
- b.** Collaborative Presentations – review assignments and deadlines
  - i. Review recommendations for changes to the 2009 Work Plan and out-years – To BC after Researchers Meeting, then SOWs revised.
- c.** Discuss the “take home” points of this workshop to share with the Management Committee the next day.

ATTACHMENT 1  
Workshop Participants

Tom Chart, USFWS, Upper Colorado River Endangered Fish Recovery Program  
Angela Kantola, USFWS, Upper Colorado River Endangered Fish Recovery Program  
Melissa Trammell, National Park Service  
Dave Speas, Bureau of Reclamation  
Trina Hedrick, UDWR  
Matt Breen, UDWR  
Leisa Monroe, UDWR  
Angela Hill, Larval Fishes Laboratory, CSU  
Tate Wilcox, Larval Fishes Laboratory, CSU  
Bob Burdick, USFWS  
Scot Durst, USFWS, San Juan River Recovery Implementation Program  
Michelle Morgan, USFWS (Vernal – CRFP Acting Project Leader for Dave Irving)  
Aaron Webber, USFWS  
Tildon Jones, USFWS  
Mark Fuller, USFWS  
John Hawkins, Larval Fishes Laboratory, CSU  
Kevin Bestgen, Larval Fishes Laboratory, CSU  
Bruce Haines, USFWS, retired  
Anita Martinez, CDOW  
Jenn Logan, CDOW  
Cameron Walford, Larval Fishes Laboratory, CSU  
Boyd Wright, CDOW  
Travis Francis, USFWS  
Chuck McAda, USFWS  
Pete Cavalli, Wyoming Game and Fish Department  
Bill Atkinson, CDOW  
Bob Muth, USFWS  
Paul Badame, UDWR  
Dean Riggs, CDOW  
Shane Capron, Western Area Power Administration  
Lori Martin, CDOW  
Doug Osmundson, USFWS  
Tom Iseman, The Nature Conservancy  
Tom Czaplá, USFWS, Upper Colorado River Endangered Fish Recovery Program

## ATTACHMENT 2

### Electrofishing Standardization

Burkhardt, R. W. & S. Gutreuter. 1995. Improving electrofishing catch consistency by standardizing power. NAJFM 15:375-381.

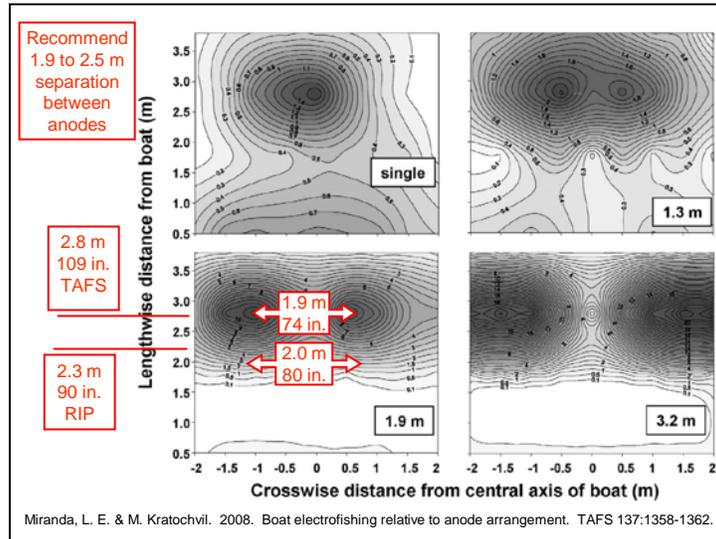
Bonar, et al. 2000. Standard fish sampling guidelines for Washington state ponds & lakes. WDF&W, Olympia. 28 pp.

Bonar, S. A. & W. A. Hubert. 2002. Standard sampling of inland fish: benefits, challenges, & a call for action. Fisheries 27:10-16

Miranda, L. E. 2005. Refining boat electrofishing equipment to improve consistency & reduce harm to fish. NAJFM 25:609-618.

Miranda, L. E. & C. R. Dolan. 2003. Test of a power transfer model for standardized electrofishing. TAFS 132:1179-1185.

Miranda, L. E. & M. Kratochvil. 2008. Boat electrofishing relative to anode arrangement. TAFS 137:1358-1362.



## Electrofisher Operation

Pope, et al. 2001. Assessment of outputs from Smith-Root Model-5.0 & Model-7.5 GPP electrofishers. NAJFM 21:353-357.

Dolan, C. R. & L. E. Miranda. 2004. Injury & mortality of warmwater fishes immobilized by electrofishing. NAJFM 24:118-127.

Martinez, P. J. & A. L. Kolz. 2009. Evaluating the power output of the Smith-Root GPP 5.0 electrofisher to promote electrofishing fleet standardization. NAJFM : In Press.

Miranda, L. E. & C. R. Dolan. 2004. Electrofishing power requirements in relation to duty cycle. NAJFM 24:55-62.

Miranda, L. E. & A. B. Spencer. 2005. Understanding the output of a Smith-Root GPP electrofisher. NAJFM 25:848-852.

Van Zee et al. 1996. Comment: clarification of the outputs of a Coffelt VVP-15 electrofisher. NAJFM 16:477-478.

**FLUKE 87V True RMS Multimeter**



**FLUKE i200 AC Current Clamp**



Figure 2. Measurement Setup for i200

### **Electrofishing Data**

Dauwalter, D. C. & W. L. Fisher. 2007. Electrofishing capture probability of smallmouth bass in streams. NAJFM 27:162-171.

Gatz, A. J. & R. S. Linder. 2008. Effects of repeated electrofishing on condition, growth & movement of selected warmwater stream fishes. NAJFM 28:792-798.

Hansen, M. J. et al. 2004. A reexamination of the relationship between electrofishing catch rate & age-0 walleye density in northern Wisconsin lakes. NAJFM 24:429-439.

LaPointe, W. R. et al. 2006. Point sampling by boat electrofishing: a test of the effort required to assess fish communities. NAJFM 26:793-799.

Schoenbeck, C. W. & M. J. Hansen. 2005. Electrofishing catchability of walleyes, largemouth bass, smallmouth bass, northern pike & muskellunge in Wisconsin lakes. NAJFM 25:1341-1352.

### **Concluding comments**

- strive for same dimensional configuration (size & spacing) of anodes
- mixing electrofisher control boxes inconsistent with electrofishing fleet standardization
- recent research & electrofishing literature focused on Smith-Root (S-R) GPP electrofishers
- external metering offers promise for optimal selection of electrofishing setting & consistent power output
- Coffelt or S-R VVP-15 electrofishers likely have same metering, setting selection & power output questions
- consider factors affecting capture success; density dependence; catch-per-effort vs. population estimation

### **General Topics for Discussion**

- Gear efficiency, e.g., VVP vs GPP.
- 2<sup>nd</sup> level synthesis — Please review the summary of the Nonnative Fish Subcommittee's (NNFSC) November 3, 2008, conference call. We hope to get an RFP out in early 2009. The PI's need to weigh in on the proposed direction.
  - The proposed approach will likely indentify data gaps (e.g., age/growth; predation rates; rates of recruitment). The PI's should discuss what they think are the most critical data gaps and how we address these gaps.
- Data files — Because the NNFSC will recommend that the 2<sup>nd</sup> level synthesis include 2008 data, we'll need an estimate of when PI's can submit their 2008 data files to Chuck and Travis. The degree of "standardization" in the 1<sup>st</sup> round of data submittals (2004–2007) varied greatly. Travis will not have the time to clean up anyone's 2008 data.
  - Are all our SMB and NP captures from other studies also being submitted to Chuck and Travis?
- Other Nonnative Species, e.g., walleye (should we be more concerned?); channel catfish (Vernal CRFP, and perhaps Moab UDWR, are not removing channel catfish in Whirlpool / Island Pk / Split Mtn Canyon. In 2008, and possibly previous years, crews could have been removing a lot of channel catfish with negligible effect on SMB removal).
- Review the NNFSC's attempt to prioritize recommendations from past nonnative fish workshops (document posted to listserver). Whereas the PD's office values the input from individual researcher's here, we think it will be very difficult to get meaningful input in this setting. Therefore we would entertain a general discussion of this recent exercise and encourage individual researchers to communicate specific concerns through their BC representative.

## **Suggested Approach for Developing the Collaborative Presentations**

*General Approach* — PI's will need to come prepared for a productive workshop (please see Prep work below). At the workshop:

- Discuss 2008 Results.
- How do the PI's best get their message across?? Discuss additions, deletions, or modification of the 2007 data presentations. Please come prepared to discuss alternative approaches to data presentations. If we determine that the task this year largely consists of adding 2008 data to the 2007 analyses – our job is relatively easy.
- Provide Kevin, Paul, and Boyd with copies of raw data or commitments to provide them in the near future.
- We should encourage other PI's, or the PD's office, to take on specific analyses, which contribute to the collaborative presentations – document those commitments and schedule due dates.

### *Specifics*

- Prep work:
  - Everyone please review the 2008 Annual Reports prior to showing up and bring copies with you.
  - PI's please bring your data files/laptops if available.
  - Please review the 2007 collaborative presentations (posted on the Program's website).
- The 2007 presentations should serve as good templates, so let's start there. If there are better ways to tell the story let's make the necessary changes, e.g.:
  - Standardize the data presentations – population estimates and catch indices for  $SMB \geq 200\text{mm TL}$  and  $< 200\text{mm TL}$  from everyone – should make for more powerful comparisons.
  - Let's see if we can come up with a better description of size structure of smallmouth bass throughout the Upper Basin.
  - Let's take another look at the northern pike movement data.
  - Can we delve a bit more into time of spawn and cohort strength or does this need to be relegated to 2<sup>nd</sup> level?
- Start with the Native Fish response data. Considering the 2008 environmental conditions, the small bodied fish sampling (including Projects 138 and 22f) could be the Big News for 2008.
- Discuss observations and results as they relate to the 2008 water year. Answers to the following should be reflected to some degree in the collaborative presentations.

- a. How was your sampling affected?
  - b. How was habitat affected?
  - c. How were your target species affected? (Any and all observations are fair game.)
  - d. How might your observations relate to future experimentation on the use of flow/temperature manipulations to disadvantage nonnative fish?
- 2009 Work Planning – Because there may be less time for open discussion at the Researchers Meeting than we've had at previous NNF workshop, it will be important that the group focuses on their highest priority issues. As was done last year, let's try to close out each collaborative presentation with the pertinent recommendations. Please remember that any changes to the 2009 Work Plan will be approved by the BC and MC.