

December 14, 2009

Draft Summary
NONNATIVE FISH MANAGEMENT WORKSHOP: 2009

December 8–9, 2009
Doubletree Inn, Horizon Drive
Grand Junction, Colorado

Purpose of Workshop.—Provide a forum for principal investigators of nonnative fish management projects and other interested parties to: a) discuss new developments, findings and progress related to the Recovery Program’s efforts to reduce the threat of nonnative fishes in 2009, and identify recommendations for the 2010 work plan; and b) collaborate on data presentations that synthesize results from 2009 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 26-27, 2010. These presentations will synthesize field data collected during 2009 and previous years as they relate to: a) smallmouth bass (SMB) 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 2010 and out-years. (We should strive to roll these recommendations into the collaborative presentations.)
3. Review and evaluation of prioritized recommendations and progress towards implementation (posted to list server on Nov 10, 2009)

Materials to Review In Preparation for the Workshop:

- 2009 Project Annual Reports (posted to the Recovery Program’s website).
- Discussion topics (from NNFSC, 11/30/09 – Attachment A)
- Other supplemental information identified with the attached discussion topics.
- Suggested approach for developing the collaborative presentations – Attachment B.

December 8: Convene 8:00 AM

1. Introduction and welcome (Dave Speas; 10 min)

- A) Workshop purpose and desired outcome. Dave Speas provided an introductory presentation that included a review of past hydrology and thermal regimes throughout the Upper Basin. This information was intended to set the stage for discussions of cohort strength and what we might expect in terms of SMB population dynamics in 2010.
- B) Workshop structure, process, rules (annual reports received Nov 13; NNFSC review Nov 13-30; NNFSC formulation of study questions Nov 30, posted Dec 1).
- C) Workshop participants' roles, responsibilities, expectations
- D) Housekeeping

Krissy Wilson distributed table of recommendations accrued from nonnative fish workshops since 2004 for participants to help participants review what we've accomplished and what we still need to work on.

- ### **2. Standardization of EF fleet (Martinez, 30 min)**
- The Upper Colorado River Endangered Fish Recovery Program is unique in the level to which we've taken electrofishing standardization. Pat reviewed ambient conductivities in various UCRB rivers and the three aspects of fleet standardization: 1) anode configuration & deployment; 2) electrofishing waveform; and 3) electrofishing operations. The goals of standardization are to: 1) promote consistent methods for data comparability; 2) optimize waveform regardless of water conductivity; 3) minimize fish mortality due to electrofishing or handling; and 4) maximize effectiveness for removal or monitoring. Pat described the metering limitations of the Smith-Root GPP electrofishers and the need to measure peak volts or peak amps. Pat reviewed results of field data collected in 2009. Pat believes we're very close to having our electrofishing fleet standardized now. Pat reviewed the goals for standardization with the FLUKE 87V meter. In conclusion, they found mixed results with meters (due to minimal training or misuse); the i200 clamp must account for current to BOTH anodes; recording GPP 5.0 settings is essential for assessment; 2009 fish capture, response and conditions were generally favorable; theoretical and calculated amps were similar up to $\sim 750 \mu\text{S}/\text{cm}$; the GPP 5.0 is unable to maintain power output at $> 750 \mu\text{S}/\text{cm}$; we should consider smaller anodes for electrofishing at $> 750 \mu\text{S}/\text{cm}$; VVP users also must record voltage to optimize data utility. Rich Valdez asked about the effect of boat age/amount of paint on resistance and Pat said that the boats should be clean and unpainted. Vertical position of the anodes should be adjustable to keep them properly positioned in the water. Pat said they will ask researchers to do this data collection again in 2010. > The Program needs to consider expanding this standardization process to the raft electrofishing fleet in the future.

- ### **3. Project updates (20 minutes each, including Q/A).**
- Principle investigators should assume that their annual reports have already been read by participants and needn't summarize annual reports in their entirety. Instead, focus on (1) project highlights, such

as important trends in data, new developments, observations linking target species response to environmental variables (especially flows, temperature), recommendations to improve efficiency or changes to 2010 SOW's, etc; (2) implementation of new projects or changes to existing projects. Describe preliminary observations on implementation of changes to 2009 scopes of work. What worked? What didn't? What should be changed for 2010; and (3) be prepared to address questions identified by NNFSC (following review of annual reports received on Nov 13) and distributed on December 1, 2009. While it may not be necessary to tailor your presentations to these questions, be at least prepared to discuss them at the workshop.

A) Smallmouth bass

- a) 98a & 125 (Hawkins/Walford/Wright). John noted that smallmouth bass were nonexistent or rare in the Yampa River prior to the 1990's. Removal intensity has been steadily increasing (number of miles and hours of electrofishing). Fyke nets this year caught no bass (pike only). In 2009, crews collected 11,907 smallmouth bass with electrofishing boats and angling; of those 10,118 were removed. In addition, more than 8,000 smb were removed with electric seines. Catch rates on first three passes in April were very low, so they deferred marking until pass 4. John believes the fish weren't near the river margins and accessible before pass 4. John reviewed results primarily from Little Yampa Canyon (LYC) and Lily Park. Generally, abundance has decreased in Little Yampa Canyon and remained about the same in Lily Park (which has a very high smallmouth bass density). CPUE has declined over time in both reaches. Based on male bass caught over nests, reproduction appears to be in Little Yampa Canyon rather than Lily Park. Nests were found in areas of no velocity, ~1 meter deep, and clean of silt. Backwaters or shoreline embayments were common nesting sites. In 2009, they recaptured 32 smallmouth bass that escaped from Elkhead Reservoir (28 of which were placed in Elkhead in 2007). John displayed graphs of growth of age-0, age-1, and age-2 smallmouth bass growth over the past three years. In conclusion: 1) abundance declined in LYC and maybe Lily Park; 2) bass can move throughout river (up and down); 3) reaches with high adult abundance may not have local reproduction; and 4) bass can escape from Elkhead Reservoir; 5) it is apparent that this project affords the program a good tool for tracking SMB cohorts through time. The escapement issue was revisited later in the workshop.
- b) Elkhead fishery status (Wright) – Northern pike are not part of CDOW's lake management plan for Elkhead. The cohort of smaller pike they've been following in Elkhead were hatched in 2004 & 2005 when the reservoir was drawn down to the conservation pool. Conclusions: Medium sized pike currently abundant and risk for escapement high, but long term threat much lower due to lack of significant recruitment;

CPUE of adult smb hasn't increased, despite increased stocking rates; ~50% of adult smallmouth bass in reservoir in 2009 are a result of translocation efforts; However, expected to decrease as abundant juvenile bass recruit to larger size classes; Harvest rates of SMB poorly understood without creel data; Entrainment into spillway documented in 2008 and 2009, but significantly reduced for SMB in 2009; 2009 pike tagging effort ineffective due to timing conflicts with Yampa River work and inaccessibility of inlet area – solution needed (e.g. public fishing contests coordinated with marking effort). Rich asked about escapement, recognizing that we don't have an accurate estimate, but that it could be quite significant. Aaron asked if it would be possible to rotenone Elkhead and start over with a new fishery. Boyd said he could not provide an agency perspective on that.

- c) 110 (Jones) – Early April sampling was conducted this year to try to assess the population structure and possibly capture more adults. However, the water temperature was very cold and captures were few. The smallmouth bass population estimate declined from 2008. SMB removal efforts resulted in a 30% exploitation rate for subadults and 37% for adults; adding removed bass to the estimates result in a 40% subadult; 51% adult exploitation rate. All *Gila* observed during electrofishing were captured (401) and PIT-tagged this year. There was a wide range of sizes and they were distributed throughout the canyon. The 2007 cohort dominates the smallmouth bass population. SMB high densities were in the top reaches (1&2). Recommendations: 1) start sampling based on water temperatures or perhaps a flow trigger; 2) continue tagging SMB, decide whether to coordinate with Proj 125 (upstream) or Proj 123a (downstream); 3) define objectives for PIT-tagging roundtail chub in order to refine sampling; and 4) increase removal effort from Lily Park to Deerlodge Park by overlapping passes with Proj 125 or incorporate low flow passes. NPS approval will be necessary if jet boats use is proposed. The 2007 bass cohort can be expected to recruit into adulthood in the next year or so and could reproduce significantly, depending on river conditions.
- d) FR-115 (Bestgen) – Smallmouth bass abundance in Lodore and Whirlpool were lower in 2008 and 2009 than 2007. They've found evidence of SMB predation on stocked bonytail and believe they're preying heavily on roundtail chub, also. Red shiner distribution expands upstream with warmer temperatures. Recommendations: 1) continue to remove predator fishes; 2) continue to monitor fish community response; and 3) consider flow or water temperature management to disadvantage SMB reproduction. Otolith work has shown onset of SMB spawning at ~16°C (just before in the Yampa, just after in the Green). Spawning occurs under declining or stable base flows, with the annual onset dictated by water temperatures. Peak hatching occurs ~3 weeks after

onset, reproductive season is relatively short. SMB reproduction was again very late in 2009. Factors known to disadvantage SMB include increased flows, reduced temperatures, and increased turbidity.

- e) 123a (Jones/Badame) – SMB population estimates were high in 2004, with a significant decline in adults, but a fluctuating or stable number of subadults since that time. Adult exploitation rate 57% subadults 30%. In summary, the 2007 SMB cohort is still strongly represented. 2009 CPE was half of that in 2008 (lowest yet). Catfish are very abundant (a low precision estimate suggest ~3,000/mile) and crews were only able to remove 3.8% of the population (11% of the adults). It will take considerable work to ever make a dent in catfish abundance.
- f) 123b (Monroe) – Exploitation rates of 43.6% for juveniles and 66.3% for adults. 2009 population estimate and fish/mile estimates more reliable than previous years. 2009 down to 27 adults/river mile, so are reaching the goal of <30. Highest abundance was at Sand Wash. Recommendations: remove SMB from the Green River from the Duchesne River down to Sand Wash (note that 15 of the 43 walleye captured also came from the Sand Wash reach); continue using pass 4 as the marking pass. Need to be consistent with how Tildon is adjusting for growth in the three size classes.
- g) 126a, b (Burdick/Wright-CDOW) – SMB CPE has been declining over the last 6 years. CPE increases during periods of high turbidity. Population estimates decreased from 2006 to 2008, and then increased somewhat in 2009 (however there were few recaptures in 2009, so the reliability of this estimate is suspect). Currently, there are fewer than 30 adult SMB per mile in the sampled Colorado and Gunnison River reaches. Fruita State Park to Corn Lake is an area of high concentration. SMB relative year class strength appears to correlate with the number of days water temperature exceeds 14° C. LMB <100mm have increased in relative abundance each year, but do not appear to be recruiting to larger size classes in main channel habitats. Bob believes that largemouth bass population dynamics may be controlled primarily to environmental conditions in off-channel floodplain habitats and do not seem to persist in the mainchannel environment. Bob doesn't expect any changes in project methods, etc. for 2010-2011.
- h) 154 (Groves): Duchesne/White river updates – Recommendations: 1) Temperature (maintain cool water fishery, establish native vegetation, increase minimum flows); 2) hydraulics (provide passage on the Myton diversion, prolong peak flows, increase minimum flows); nonnative interactions (adult nonnative control, prevent nonnative migrations in and out of drainage with a weir, determine nonnative use of Green

River.) Mark believes installation of a floating weir in the Duchesne may have merit.

- i) C18/19 (Johnson): (Dr. Johnson was not present at the workshop.)

B) Smallmouth bass group discussion (1 hr) to address:

- a) Response to NNFSC questions. (Most discussion on these questions is associated with individual projects, below).

- b) Conclusions, recommendations

Yampa (125, 98a)– John suggests determining areas of SMB production by rapid assessment (nests are hard to see, so go through with backpack shocker, seine or electric seine to determine where have greatest concentration of age-0 fish to identify where reproduction is most concentrated). Cameron Walford emphasized that intensive late-season removal is important, especially in areas of high spawning activity. This strategy would be especially important if the 2007 year class becomes sexually mature this year and hydrologic conditions favor increased SMB reproduction. Dave Speas asked John Halkins (project 125) that, knowing the 2007 year class could be maturing and spawning this year, what would he do differently regarding SMB removal effort allocation? John suggested that maybe Boyd (project 98a) could continue his sampling during the SMB spawning season, which would increase overall exploitation. How to fill gap after end of CDOW sampling? Bob Burdick said they have a slow period during the latter half of June during which they could assist with removal during the SMB spawning season. Tom Chart asked that if we have a dry year, should we be prepared to increase electric seine sampling as well? Cameron said possibly, but the group was most interested in trying to affect the spawn. **>PI's for 98a, b, 125, 126 will work together to determine how/if extra effort could be expended during the descending limb of the hydrograph.** Dave Speas asked that given the parameters of capture probability and marked and unmarked fish, escapement of SMB from Elkhead Reservoir could be significant, especially when considering natural reproduction and recruitment occurring in-lake. **How much escapement is too much? >NNFSC, w/ Colorado as the lead should tackle this concern over the next year.** Rich Valdez observed that since marked fish are being put in reservoir, we **could conduct a mark-recapture abundance estimate in the reservoir, and then estimate proportion of fish leaving the reservoir.** **>NNFSC should consider this, also.** Melissa noted that we need to compile data for fish translocated to Elkhead over all years; **>the NNFSC will discuss how to do this as well.** Boyd speculated that perhaps something changed in the reservoir configuration with enlargement that's attracting bass to the spillway. We maybe need to look at a weir or an electric screen or other options.

Aaron noted that anglers are clipping tags and researchers may need to do fin-clips in addition to tagging fish. We simply can't have a source population of these nonnative fish in the drainage.

110 – Tildon doesn't think April sampling was very effective; however, he is considering **coordinating bass marking with other Yampa work in April/May (as opposed to work downstream in the Green River)**. >**Tildon will review and coordinate as appropriate with aforementioned upper river researchers**. Probably will recommend discontinuing channel catfish removal in light of workload and lack of effectiveness. As for *Gila* PIT-tagging, need to refine purpose (and consider handling stress, especially with PIT-tagging as the water warms). Aaron noted that we may need the population data for roundtail; Krissy agreed, saying it's likely they'll be the next species proposed for listing in the upper basin. Tom Chart suggested getting input from Tom Czaplak, but thought Tildon's recommendation was a good one. Rich recommended continuing PIT-tagging all chubs because it contributes to capture history. >**BC needs to resolve question of PIT-tagging chubs in Yampa Canyon**.

123b –The group supported the proposal to extend removal to Sand Wash (and Trina later recommended extending down to just above Desolation Canyon). 154 –Trina said we've documented large fish in the Duchesne, many may move out at low flows; suggest tagging larger these fish instead of removing them so we can detect whether they move into the Green. Mark suggested telemetry. Melissa and others agreed it would be helpful to determine emigration from the Duchesne. The group generally agreed to investigate movement of Duchesne River SMB in 2010.

With regard to the Green River, Dave Speas suggested it may be time to propose experimental flows. Tildon suggested the possibility of extending a cold peak with Flaming Gorge releases *after* the Yampa peak.

126 - Dynamics between SMB and LMB in the Colorado River (discussed previously, under project 126 above).

- c) overview of collaborative presentations (not discussed; NNFSC members later identified speakers for the Researchers Meeting and advised them to collaborate with respective project PI's to develop collaborative projects using 2008 presentations as a guide).

C) Northern pike project updates:

- a) 98b (Webber) – Aaron reported 31% exploitation of adults in 2009. No statistically significant decline, but there do seem to be fewer fish. CPE has declined steadily since 2009. Length frequency has shifted down and there are fewer large fish. Concern regarding escapement from Loudy-Simpson and Craig Justice Center ponds. Escapement happens every year and the SMB from Craig Justice Center pond had to have been transferred by an angler. Aaron believes we need to consider euthanizing instead of translocating fish (or at least discuss translocation sites and tagging protocol – marks in addition to tags that anglers can remove). Aaron put all the fish he captured this year into State Park Headquarters Pond. Aaron also suggests removing fish from Loudy-Simpson as part of his project. Aaron recommended sending several people to the biocontrol symposium. Tom Chart agreed that translocation has been a tough issue for many biologists. Based on the recent information from Loudy-Simpson (e.g. escapement; in-situ reproduction; and overwinter survival) we should re-evaluate Loudy-Simpson as a translocation site. John Hawkins asked if there's a way to prevent escapement from Loudy-Simpson. Billy suggested that we need a better understanding of the relative contribution of each source. Krissy suggested that we need to use the protocol outlined in the Nonnative Fish Stocking Procedures to address this.
- b) 98a (Wright) – Overall decrease in larger fish since 2004. Exploitation rate ~65% this year, similar to last year. Conclusion: little change in abundance since 08, but new size class 250-450mm documented. Increased confidence interval resulted from poor coordination btw PI's and removal prior to tagging. Abundant YOY documented at upper edge of CH during CSU late season sampling. CPUE in Lily Park continues to decline (25% of 2004). Escapement from Loudy-Simpson was documented. Recommendations: continue abundance estimates. Improve coordination between PI's – separate tagging dates for 2 species may not be possible. Continue CSU late season effort. Continue translocating majority of pike to State Park HQ and stock Loudy-Simpson only after runoff peaks.
- c) Other CDOW projects (Atkinson) – Stagecoach and Catamount reservoirs and Yampa R. down to Steamboat. Stagecoach CPE has been declining. Proposed expansion of Stagecoach includes agreements to control pike. Billy very concerned about a proposed Morrison Creek Reservoir which would be conducive to rapid expansion of pike. Billy has removed 6,031 pike from Lake Catamount (private) since 2007; full scale removal underway and numbers of pike dropping in Catamount. Billy has expressed concern about another gravel pit proposed near Catamount and has suggested a pike excluding pre-pond for this development. Habitat modification work – working with COE to deal with pike. Chuck Lewis SWA backwater slough begin rehabilitated.
- d) 123, Green River (Monroe/Bestgen/Jones) – UDWR removed 38 pike via pike specific sampling in '09. A total of 78 pike were removed

throughout all sampling. Average length smallest this year: 546 mm. A few Age-0 pike were collected; UDWR believes these fish were spawned upstream of the Uintah Basin. However, Dave Speas and Melissa Trammell advised that given spawning activity observed in the Ouray Reach in previous years and pike reproduction in Browns Park, spawning in the Uintah Basin should not be ruled out.

D) RM 151 backwater site visit (Wernke, 15 min.) – The Yampa River has been quite mobile over the last several decades and has a number of oxbows in this area. Considerable survey work, data collection, and engineering studies (\$100K-\$150K) would be required before any habitat modification could be done. Options considered: 1) construct dikes at the two entrances and the exit (\$1M+); 2) construct a grade control structure at the exit and allow the oxbow to fill in naturally (\$300K - \$500K, but there are several concerns with this one). A historic landslide upstream has the potential to become active again. Any work in this section of river would be considered high risk with potential of creating other problems in adjacent reaches.

E) Northern pike group discussion (1 hr) to address:

- a) Response to NNFSC questions (most of these were discussed under specific projects).
- b) Conclusions, recommendations – **>PI's will coordinate on marking trips (Boyd lead for pike and John Hawkins lead for bass)**. Dave Speas asked if marking on the second or third pass improved precision. John Hawkins asked whether it's really appropriate to add back in the fish removed in the previous passes (technical issue – need to be sure everyone is evaluating this the same way – especially in the synthesis reports). Rich said it's important to do it the same way each year for indices. Rich asked if the tag losses between the mark and recapture passes is significant enough to affect population estimates. Based on tag loss investigations conducted in 2008 the group did not feel this was an issue for our single mark / single recap design. However, André suggested the best way to minimize CV is to improve recapture rates, so he recommends using all the recapture data. We're concerned about bias, yet we are constrained by the assumptions of the one model (MT) we're using. A solution would be to select some other models and compare them. [Later in the workshop Andre clarified that the M(t) model is appropriate in a single mark / single recap design.] Dave Speas noted that closure may be less of a concern since we're now doing river-wide estimates. On a related note Bruce Haines suggested continuing to consider exploitation of tagged fish as a measure of our effectiveness – as this provides a minimum estimate.

Loudy-Simpson translocation viewpoints: 1) discontinue (put all fish in Headquarters pond – it's a put-and-take fishery, anyway); 2) continue

(important for public relations); 3) reduce. Krissy re-emphasized the need to review this on the basis of the Nonnative Fish Stocking Procedures. Tom Chart said the Service's ES office views the potential downside of escapement from translocation in the context of the Program's overall nonnative fish management strategy. Trina pointed out the need to protect the entire native fishery downstream. Aaron asked if we could achieve the necessary public relations by stocking ten rainbow trout for every northern pike we remove. Dave Speas suggested that the **>NNFSC, with Colorado as the lead, using all available information will re-evaluate Loudy-Simpson as a translocation site**. Dave Speas suggested that both the Non-native Stocking Procedures and the Aquatic Management plan should be reviewed in advance of these discussions. Tom Chart emphasized the importance of taking the opportunity to comment on Colorado's Yampa River Aquatic Management Plan. Tom suggested that escapement from L-S may not be as important as continuing the focus on sources of nonnatives.

- c) Overview of collaborative presentations (See item B(c) above.)

Adjourn 6:00 PM

December 9: Convene 8:00 AM

- F) Native fish response and other species project updates (1 hr)

- a) 140, Yampa River (Bestgen) – Because of smb accelerated growth rates, a smb hatched on the same day as a native fish is capable of eating the native fish at 11 days. Slight increase in native fishes in 2008 and 2009. Mixed results between treatment and control reaches. Proportion of native fishes in isolated pools much higher than in the main channel in all years, with a slight increase in native fishes in the main channel in 2008 and 2009. Frequency of native fishes in the main channel habitats has been increasing since 2005. High flows/cooler temperatures in 2008 and 2009 appear to have depressed smb overwinter survival. Conclusions: Native small-bodied fish reduced, especially in mainstem Yampa as recently as 1999; SMB abundance increased markedly since 1999; fish community changes associated with lower flows and warmer water that began in 2000; Significant reduction (5X) of age-0 SMB achieved in treatment reach, but still abundant; Control & treatment isolated pools support native fish, but only when few/no SMB present; Mottled sculpin reappeared in 2007 & 2008, mountain whitefish in 2008; Abundant sand shiners (05-08) in treatment reach may indicate a removal effect; Positive response of small-bodied native fish in Yampa mainstem detected in 2008; Reach-wide response due to flow/temp benefit; Higher treatment reach response due to removals. Information needs: year class strength related to timing of spawning and flow and

- thermal regimes; year class strength and length effects on overwinter survival; removal effects related to same. Recommendations: continue earlier sampling; continue work in Lily Park; investigate base flow supplementation effects; continue to investigate smb early life history.
- b) 144, Green River (now 138; Breen/Hedrick) – Increases in native fishes since 2005. 641 YOY CPM this year (half from one backwater). Some CPE increases in nonnatives in '08 and '09. Analyzed correlations btw species abundance and several environmental factors. Distribution of pikeminnow and bluehead sucker varied by river reach. Natives did well in 2009, shiners and fathead minnow still low; when CPM numbers high, a different distribution is seen in the middle Green than when CPM numbers are low. Can't yet show a statistical correlation between nonnative removal efforts and native fish response. Recommendations – continue sampling YOY; continue monitoring the 3rd backwater in each 5 mile reach; use information from larger, more comprehensive analysis (CSU /Argonne) to identify important variables for the middle Green.
- c) 158 (new start), Green River backwater NNF removal (Monroe/ Jones) – Tildon Jones indicated that larval drift sampling at Split Mountain did detect CPM in low numbers; correlations with catch at Echo Park still need to be made. 68% of the backwaters FWS sampled had at least one CPM. CPM capture increased later in the day as backwaters became warmer than the main channel. Trina reported that depletion of nonnatives from backwaters was only attempted on the first 2 passes and discontinued / diminished once CPM were identified. Block nets may not have been completely effective. UDWR changed their study plan and kept block net up in backwaters where CPM were abundant in an effort to protect them. Also reduced sampling intensity after CPM were detected. Conclusion: document abundance of larval CPM; reduce densities of nonnative fishes; successful at excluding nonnative fishes? Recommendations: focus on different block techniques (Bruce Haines said that we may not need block protection after CPM reach 20-30mm, and removing block net allows CPM to move from one backwater to another. Tom Chart thought the original intent was to reduce predators / competitors prior to CPM arriving in the backwaters. UDWR's proposal to delay depletion and blocking until CPM were identifiable is changing the focus. UDWR thought they could begin the study later in the year (based on flow/temperature and presence of larvae in the drift); and then do more rigorous depletion effort. Rich Valdez said that this is probably the most critical CPM life stage; recommend sticking with the experimental design (don't worry about stressing fish, etc.). Rich noted we have CPM backwater data back to the 60's; and Paul Badame said they're beginning to look at that. Paul noted that we're not differentiating between nonnative sizes (whether they are prey base or predator, for example), but Kevin Bestgen said this may be important to determine effects of red shiners, for example.

- d) Colorado River: - Jenn Logan said CDOW did something of a pilot study to evaluate methods they could use (single mark/recapture of large-bodied fish in Anderson's 2 reaches). Data not analyzed yet. May look at adding in small-bodied fish next year.

G) Native fish response group discussion (30 min) to address:

- a) Response to NNFSC questions (see individual project discussions, conclusions, recommendations).
- b) Conclusions, recommendations – Rich recommended maintaining 3x3 block design on #158. Trina believes they could make a few changes (eliminate treatment A, use smaller mesh size for block) and still maintain an experimental design. Melissa concurred with eliminating treatment A. Bruce suggested the block protection might be very effective for just a short 2-week period. Paul Badame noted that most of these CPM come from the Yampa and already passed the nonnative gauntlet. What are relative sizes between native and nonnative arriving in the backwaters? Kevin Bestgen noted that it is important to document size of nonnative fishes and also that we know we have some recruitment in some years in the Green R., but need to get at question of CPM vulnerability, esp. to nonnative cyprinids. Paul Badame said we have same assemblage minus bass in the lower Green, but seeing positive correlation between CPM and sand shiners. Paul Holden observed that 2009 was very interesting, i.e., an incredible year for native fish and threw experiments off a bit (and we may be asking how we can re-create those conditions in future years). Tildon said that this study allows us to see where the fish are “in the middle” between when we see them in the drift and then in fall samples. Rich suggest that we should stick with objective of determining if we can reduce nonnative fish in these backwaters regardless of whether CPM are present. Could follow Bruce's suggestion of blocking the backwaters for a shorter period of time, but need to be sure we know the right time. Kevin suggested an intentional experimental approach of manipulating a backwater when CPM are present. Melissa asked if larval drift was followed up with larval seining along the shoreline? Tildon said yes, samples are still being processed. Rich suggested that maybe one short-period experimental design could be followed by and another design to look at backwaters over time. **>PI's will discuss and revise SOW #158.**
- c) Overview of collaborative presentations (see item B(c), above.)

H) Other species (1 hr)

- a) 150, Green River white sucker removal (Monroe) – White suckers removed as part of three UDWR projects; highest CPE during northern pike removal. No shift in size structure seen yet. Don't know if hybridization is being reduced. Kevin said that he's seeing increasing

numbers of white suckers and hybrids in Lodore, especially in 2009. Would be important to determine downstream abundance in areas where razorback sucker occur and spawn. Tom Chart asked if we should gather fish community information in the Island/Rainbow/Split reaches? – unresolved. Rich said that this type of information collected in the Animas (best habitat for flannelmouth and bluehead sucker) downstream of Durango has been very useful. In that river they have documented the expansion of white sucker hybridization from earlier. localized captures of white sucker .

- b) Results from expanded effort: carp/sucker removal (125; Hawkins/Walford) – First year for this work; concurrent with SMB and pike removal; control/treatment. Recommendations: continue removing nonnative suckers and carp and control-treatment approach in little Yampa Canyon.
- c) Discussion

> For revised SOW's: PI's provide suggested changes to the BC by January 8, 2010. The NNFSC will review this information and provide their recommendations to the BC prior to, or at their January 14 meeting. The BC may need to meet or conference call shortly after the researchers meeting to finalize decisions regarding revised SOWs.

4. Review of prioritized list of recommendations from past NNF workshops and their implementation (Krissy Wilson, UDWR, 15 min including Q/A).

New recommendations from this workshop:

Krissy: Recommend implementing the floating weir on the Duchesne or the Yampa

Paul Holden: Recommend going in when starting to spawn and really target the large adult bass in the Yampa around the spawning time and at locations where spawning is concentrated in light of the 2007 year class. Dave Speas stated that PI's are going to coordinate increased effort during that time period. Is there a possibility of doing something similar in other rivers/reaches? Rich agreed that this is an important opportunity. Question: is anyone going out just prior to spawning and using first pass as mark pass when they'll be catching fish before they spawn and then mark and release them? Paul Badame said potentially 123a. Boyd said CDOW should be involved in this late-season work; all agreed. By the fifth of their 7 removal passes, they know where they'll find pike and bass, so if they took a break in June, then really focused on concentration areas later (spawning times), that would work very well with their schedule. Brandon asked if the critical temperature for smallmouth bass is being considered in timing the sampling trips. Cameron said CSU is in the field constantly and noted that turbidity events also are critical. Billy asked if more temperature loggers would be helpful. John Hawkins said CSU records temperatures; he thinks more boats on the water – especially in the gap time – is what's critical. Important to identify the gaps. Tom Chart asked if the focus is on spawning bass in 2010 should we be directing more

effort at the lower end of the their distribution (Sand Wash and below) this year ? Trina reiterated the importance of to knocking back the 2007 cohort. Don't know what reproduction is occurring in their reach. Leisa said that we also need to consider the tradeoff of additional electrofishing effort with impact on native fish populations. NNFSC should work with PI's on this prior to the researchers meeting. **>Yampa PI's (Boyd & John & Cameron) and Green River PI's (Trina, Leisa, Paul Badame and Tildon Jones should draft a recommendation for NNFSC's consideration by Jan 8, 2010 (sooner if possible).** Hawkins – we have about a month where we're not sampling spawning bass as intensively as we should; Yampa PI's need to determine the staff and equipment needed to solve that.

> NNFSC needs to update the recommendations list.

Update on floating weir technology in the upper Green/Yampa sub-basins (UDWR, 30 min including Q/A). Members of the BC, other interested parties and a private consultant (Doug Demko) visited multiple potential locations on the Yampa and Duchesne in August 2009. We just receive the consultant's site visit assessment report. Because the Yampa has higher flows and sand mobility, the Duchesne sites were determined to have a higher likelihood of success. Cost on the Duchesne sites would be \$87K for design, construction, delivery & installation. Operating costs would be separate. The consultant recommended using weir in conjunction with electrofishing and angling and conducting a multi-year effort. He also recommended a rigid weir at Maybell Ditch. UDWR thinks a similar weir could work at Ashley, Stewart, Brush and Cliff creeks. Considerations include site selection, access, land management issues, river traffic, signs, and staffing. Dave Irving noted the potential need for protecting the equipment against vandalism. Dave Speas asked about another option that Doug Demko did not have time to address – deploying something like this in Elkhead Reservoir below the spillway to get a handle on escapement. **>BC needs to review Demko's report and decide how to proceed with this technology. NOTE: The Program realizes that deployment of a weir on the Duchesne River is contingent on Ute Tribal approval.**

5. **NNF database update (Francis, 30 min).** >Data from this past field season due no later than March 1, 2010. Travis reminded PIs to perform as much QA/QC on their data as possible prior to submission to him.
6. **Programmatic synthesis update and roundtable discussion between CSU and PIs (Bestgen/Winkelman; 60 min)** – Objectives are to assess effectiveness to date; predict ability to achieve removal targets. Four phases: 1) develop a relational MS Access database; 2) Revisit abundance estimation using all of the data, individual covariates, multi-model inference, assess applicability of other CMR models; formulate a flexible population dynamics model; and 4) develop a user-friendly interface that allows Program biologists to manipulate the population dynamics model. Once the relational database is built, the Program will want to use it going forward. Note: conductivity measures were missing from most records. André would be happy to lead a MARK workshop for Program participants. Only useful to try to fit more than one model if using more than the two (mark and first recapture) pass data.

7. Wrap-up: comments on workshop format, other issues.

Adjourn 3:00 PM

8. PIs may choose to follow-up on collaborative presentations if time permits.

ATTACHMENT A

MEMO

To: Presenters and PIs for the 2009 Nonnative Fish Control Workshop

From: NNFSC

Re: Additional guidance on workshop presentations and discussion

At the beginning of the workshop, Dave Speas will give quick hydrology and temperature overview for the last 3 or more years. The presentation will cover the Green and Yampa rivers, and time permitting, the Colorado River.

In addition to the Guidance given in the agenda*, the NNFSC recommends the PIs be prepared to present and discuss the following:

General Presentation Guidance:

- Each presentation should be given in a powerpoint, but it doesn't have to be fancy, just highlights and summary, no special effects needed
- Please include any positive results ;-)
- If possible, include recommendations to improve efficiency – how can we improve?
- Each presentation should end with summary of main points, bulleted
 - Such as three (or more) most important points that help us understand project progress
- Be prepared to discuss environmental variables; PIs are encouraged to look at their CPE and Pop. Estimates in relationship to flow and temperature (annual peaks as well as time of sampling)
 - limitations of SMB reproduction and growth in relationship to year (flow/temp)
 - early life history of SMB for last 4 years: Timing of when YOY show up in year, size at end of sampling (going into winter). Give **dates**
 - NP response to flow and temp variables
 - Native Fish response to Flow and temperature variables
- Make sure all presentations give density per mile of both adult and subadult
 - Where appropriate, compare to interim targets

Group Discussion guidance

- SMB and NP: Escapement: Address the concept of how much escapement is too much, as we've been working on this question for years
 - how do we set criteria
 - how do we measure it
 - what is response if determined to be excessive
- SMB and NP: How to deal with fish removed from river before pop estimates
 - Everyone deals with it differently – how to deal with it, and make sure everyone is consistent (i.e. Burdick calculating differently)
 - to be discussed at the workshop and done in the future.

- SMB and NP: effect of growth recruitment on exploitation rates during all removal passes after the population estimates.
 - Everyone deals with it differently – how to deal with it, and make sure everyone is consistent
 - to be discussed at the workshop and done in the future.
- SMB and NP: Discuss difference between pop est exploitation rate and tagged fish exploitation rates and why they are often so different
- Colorado River SMB and LMB – Burdick - why differences in LMB and SMB? Relate to flow/temp? overbank flooding? Competitive interaction? Why more incidences of recruitment failure on Colorado?
- NP: Yampa River marking schedule for riverwide estimates,
 - work out a process to work it out next year. Someone has to make the call for marking timing for SMB and someone else for NP - Doesn't all have to be on same pass.
- NP – PIs discuss whether buffer zone is working or concept still valid, taking into account the efforts Colorado is making to reduce NP upstream.

ATTACHMENT B

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 2009 Results.
- How do the PI's best get their message across?? Discuss additions, deletions, or modification of the 2008 data presentations. Please come prepared to discuss alternative approaches to data presentations. If we determine that the task this year largely consists of adding 2009 data to the 2008 analyses – our job is relatively easy.
- Provide Leads 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 2009 Annual Reports prior to showing up and bring copies with you.
 - PI's please bring your data files/laptops if available.
 - Please review the previous years' collaborative presentations (posted on the Program's website).
- The 2008 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 $\text{smb} \geq 200\text{mm TL}$ and $< 200\text{mm TL}$ from everyone – should make for more powerful comparisons.
 - Continue to examine in detail the northern pike movement data.
- Start with the Native Fish response data. Considering the 2008 and 2009 environmental conditions, the small bodied fish sampling (including Projects 22f, 138, and 140) could be big news.
- Discuss observations and results as they relate to the 2009 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?
- 2010 Work Planning – as in 2009, there may be less time for open discussion at the Researchers Meeting than we've had at previous NNF workshops; 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 2010 Work Plan will have to be approved by the BC and MC.

Upper Colorado River Endangered Fish Recovery Program
2009 Nonnative Fish Workshop Participants

Dave Speas	U.S. Bureau of Reclamation Dave Irving
Tildon Jones	U.S. Fish and Wildlife Service
Aaron Webber	U.S. Fish and Wildlife Service
Bruce Haines	U.S. Fish and Wildlife Service
Angela Kantola	U.S. Fish and Wildlife Service, Upper Colorado River Recovery Program
Tom Chart	U.S. Fish and Wildlife Service, Recovery Program, Upper Colorado River Recovery Program
Anita Martinez	Colorado Division of Wildlife
Pat Martinez	Colorado Division of Wildlife
Kevin Bestgen	Colorado State University, Larval Fish Lab
Tate Wilcox	Colorado State University, Larval Fish Lab
Melissa Trammell	National Park Service
Shane Capron	Western Area Power Administration
Pete Cavalli	Wyoming Game and Fish Department
John Hawkins	Colorado State University, Larval Fish Lab
Rich Valdez	SWCA
Dana Winkelman	Colorado State University
Katrina Lund	Utah Division of Wildlife
Michelle Swayze	Utah Division of Wildlife
Leisa Monroe	Utah Division of Wildlife
Sara Jones	Utah Division of Wildlife
Trina Hedrick	Utah Division of Wildlife
Krissy Wilson	Utah Division of Wildlife
Brandon Albrecht	Environmental Groups
Bobby Duran	U.S. Fish and Wildlife Service
Scott Durst	U.S. Fish and Wildlife Service, San Juan River Recovery Program
Paul Holden	BioWest
Cameron Walford	Colorado State University, Larval Fish Lab
Andre Breton	Colorado State University
Bob Burdick	U.S. Fish and Wildlife Service
Lindsay Lesmeister	U.S. Fish and Wildlife Service
Lori Martin	Colorado Division of Wildlife
Mark McKinstry	U.S. Bureau of Reclamation
Angela Hill	Colorado State University, Larval Fish Lab
Boyd Wright	Colorado Division of Wildlife
Mark Fuller	U.S. Fish and Wildlife Service
Paul Badame	Utah Division of Wildlife
Travis Francis	U.S. Fish and Wildlife Service
Michelle Shaughnessy	U.S. Fish and Wildlife Service
Billy Atkinson	Colorado Division of Wildlife
Mark Wernke	U.S. Bureau of Reclamation

Doug Osmundson
Jen Logan

U.S. Fish and Wildlife Service
Colorado Division of Wildlife