

**Draft Summary
NONNATIVE FISH MANAGEMENT WORKSHOP: 2011**

**December 7–8, 2011
Clarion Inn, 755 Horizon Drive (970) 243-6790
Grand Junction, Colorado**

Assignments are indicated by “>”. **Recommendations indicated by red text.**

Purpose of Workshop.—Provide a forum for principal investigators of nonnative fish management projects and other interested parties to: a) discuss findings and progress related to the Recovery Program’s efforts to reduce the threat of nonnative fishes in 2011; b) elevate discussion and implementation of preventive strategies to combat nonnative aquatic species impacts and invasions; and c) identify new developments and formulate draft recommendations for the 2012 work plan.

Expected Outcomes:

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 24-25, 2012. Please focus on annual data summaries, population estimates, synthesis of environmental or population trends that have been pursued, or any noteworthy events we should know about (population. shifts, extraordinary environmental, etc.)

1. These presentations will summarize field data collected during 2011 and previous years as they relate to: a) smallmouth bass management; b) northern pike management; and c) native fish 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 2012 and out-years. (We should strive to roll these recommendations into the collaborative presentations.)

Materials to Review in Preparation for the Workshop:

- Agenda – note 15-minute limit for many presentations, plus Q&A. There will be additional time for discussion following each topic category.
- 2011 Project Annual Reports (posted to the Recovery Program’s website). <http://www.coloradoriverrecovery.org/documents-publications/work-plan-documents/project-annual-reports.html#III>.

- Draft Yampa River Basin Aquatic Wildlife Management Plan, October 2010 (posted to the Recovery Program's website).
<http://coloradoriverrecovery.org/general-information/program-elements/nonnative-fish-management.html>
- Draft Upper Colorado River Basin Nonnative and Invasive Species Prevention and Control Strategy sent to Biology and Management Committees on August 29, 2011.
- Approach for developing the collaborative presentations by topic category (Attachment A).

Presentations for project updates (15 minutes each, including Q/A). Principal 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 2012 SOW's, etc; (2) implementation of new projects or changes to existing projects. Describe preliminary observations on implementation of changes to 2011 scopes of work. What worked? What didn't? What should be changed for 2012; and (3) be prepared to address questions identified by the Nonnative Fish Subcommittee (NNFSC) following review of annual reports received on Nov 14, 2011 and distributed by early December 2011. While it may not be necessary to tailor your presentations to these questions, be at least prepared to discuss them at the workshop.

Wednesday, December 7, convene 8:00 AM

8:00 AM

1. Introduction and welcome (P. Martinez; 10 min)

- A) Workshop purpose and desired outcome
- B) Workshop structure, process, participation, expectations
- C) Housekeeping

8:10 AM (moderator - Brandon Albrecht)

2. Development of the Upper Colorado River Basin Nonnative and Invasive Species Prevention and Control Strategy & preliminary discussion of efforts to combat illegal fish stocking in the UCRB (Martinez et al., 20 min., including discussion)

Illegally-stocked fish are broadly distributed in basin reservoirs and incidences of illegal stocking appear to have escalated over time (especially smallmouth bass, northern pike, and walleye). Pat emphasized the need to prevent another scenario like we have in the Yampa River with northern pike and smallmouth bass. Recent meetings on illegal fish stocking to promote cooperation and consistency in interagency application of strategies to combat illegal stocking.

8:30 AM

3. Smallmouth bass (SMB) & Walleye (WLY)

- A) 161: SMB abundance and trends in the UCRB (Breton et al., 20 min.)
Annual report at: <http://www.coloradoriverrecovery.org/documents-publications/work-plan-documents/arpts/2011/nna/161.pdf>
André is conducting a two-part assessment: descriptive & in-depth. The Program removed ~165K bass from 20 reaches from 2001-2020. The in-depth analysis of six reaches uses the von Bertalanffy growth function to age fish back to May 1. Capture probabilities were affected by size and pass. Recapture probabilities are much lower than capture probabilities. Colorado-Gunnison abundance estimates declined and remained fairly flat. Density (fish/rivermile) also declined. The Middle Green abundance estimate showed an initial decline, an increase in '09, (likely '07 year class) then an apparent decline in 2010. The population recovery from '09 to '10 was less than from '07-'08 and '08-'09. 2010 was a good year for smallmouth bass exploitation overall. Echo-Split also showed an initial decline, an increase in '07 and '08, and then declined again. There was no recovery from '09 to '10. **Given potential reproduction and recruitment from a population estimate of ~33 fish/river mile, we probably need to rethink our interim target of 30 adults/river mile (too high).** Yampa Canyon appears to have continuing downward trend the last few years. Bass seem to like to hang out in Little Yampa Canyon, where immigration has kept pace with exploitation (though

the effect of immigration was much lower from 2009 to 2010 than in recent years). André has developed some draft “success criteria” for the six in-depth reaches to develop overall score (using a structured-decision type process) and showed increasing success through '07, not so good in '08 and '09, but then 2010 was the most successful year to date. Melissa commented that the environmental criteria may have helped us in 2010. Conclusions: smallmouth bass adult declines likely due to combined effects of removal and reduced recruitment. This appears to have translated into some improvement in native fishes. Despite recruitment and immigration, decline in adults appears to be ongoing in Lily and Echo-Split where the number of passes increased in '07 or '08. The environment also is playing a role in decline. The experimental level of effort recommended by Haines & Modde and applied to the Echo-Split reach appears to be driving and maintaining adults and sub adults below 30 adults/rmi.

- B) 161: UCRB SMB population dynamics modeling (Breton et al., 15 min.)
The model is coming together well to predict effects of different exploitation rates, nest disturbance, etc. In learning-integration-development phase at this point.

9:05 AM

- C) Smallmouth bass synthesis group discussion (35 min.)

- 1) Insights from SMB Synthesis. **André recommended that a group may want to discuss the success score table to add or subtract criteria, weight criteria differently, etc., since that is how structured-decision making is generally done.** André emphasized that when we look at effects in a reach (e.g. Middle Green and # of fishes declining), we also need to consider the exploitation (# of passes) being done upstream (and downstream).
- 2) Discerning environmental vs. removal effects on SMB density. Tom Chart asked if some thresholds are starting to show up in environmental conditions in the model given the fairly good range of environmental conditions we've had. André said we first need to define what we mean by spring flow (Haines and Modde used July averages). André's reevaluating this, and then will be able to pick it for any reach; he's doing this for five different environmental effects. **We do need a proxy parameter to discern environmental vs. removal effects. Tildon said Bruce has been considering a parameter of the number of days earlier (+) or later (-) than average peak flow (which affects growing season). André asked that folks send him any other ideas they may have along these lines.**
- 3) Setting target removal densities for SMB (propagule based?) **The group concurred that we will need to revisit our interim target of 30 adults/river mile.**

- 4) Future utility & utilization of SMB synthesis database formats, models, analyses, projections & outputs. Pat asked about overcompensatory response (what brings the numbers of fish down). André said he doesn't know for certain what the stock-recruitment relationship looks like at this point, but he's working on it and also making this as flexible as possible in the model. André said Kevin Bestgen and John Hawkins have pointed out that fairly low densities of adults have produced very large numbers of recruits. Kevin noted that the counter is that when environmental effects were strong, there was little recovery of the population from one year to the next. Kevin cautioned that stock-recruitment models are largely built on salmonids, but warmwater fishes are much more fecund.

9:40 AM: Break (20 min)

10:00 AM

- D) 125 & 98a: mid-Yampa R. SMB removal (Hawkins et al. 15 min.) Annual reports at <http://www.coloradoriverrecovery.org/documents-publications/work-plan-documents/arpts/2011/nna/125.pdf> and <http://www.coloradoriverrecovery.org/documents-publications/work-plan-documents/arpts/2011/nna/98a.pdf> High flows allowed sampling to be extended by another month. Little Yampa Canyon (LYC) is one of most important reaches. LYC adult abundance estimates (similar, but not identical to André's) lowest in 2011. However, even with intensive removal, the population rebounds from one year to the next. Where do the fish come from that recolonize LYC? LYC is an adult bass epicenter because it has abundant, complex habitat. Bass, immigrate from other reaches (including Elkhead) Canyons have abundant substrate and forage base for all life stages. Juveniles in Lily Park (LP) may be coming from upstream in LYC. Fish that moved from LYC to LP (7) were subadult size ($x=160\text{mm}$), fish that moved from LP to LYC (14) were adult size ($x=227\text{mm}$). Elkhead Reservoir escapees also are repopulating LYC. **LYC is an ideal location for intensive removal and removal from this reach could have a large influence on smallmouth bass abundance in other reaches. Uncertainties: how much more intensive should sampling be? Timing?**
- E) Interagency "surge" for SMB spawners (Hawkins et al., 15min.) Repeatedly electrofished spawning areas. In 2011, we requested a release of Elkhead fish water to extend the tail end of the sampling season in order to disrupt end of the spawning season. Removed 245 bass in 3 days (10% of fish captured all year) (John doesn't yet know the male/female ratio as these data are still being processed). Worked well this year because it didn't take much water to achieve flows necessary for sampling. The surge provides efficient removal technique and harassment of nesting bass increased. SMB production limited in 2011 by environmental conditions and removal efforts.

- F) 161: Elkhead Reservoir SMB escapement (Breton et al., 15 min.) Seven translocation cohorts 2003-2009 (2006-2009 post-enlargement). Expected escapement to be much lower post-enlargement. 264 total recaptured escapees, giving a *minimum* escapement rate of 5%. A conservative model was used to estimate a realistic escapement rate (since we know our ability to detect escapees is limited); that estimated rate is much higher (e.g., for the 2007 cohort, the model yielded an estimated escapement rate of 23% [averaging 9 different survival/tag retention scenarios], and that could be low, depending on actual survival and tag retention).

Results: All Scenarios and Average Escapement (2007)

		Annual Survival		
		0.85	0.75	0.65
Tag Retention	0.90	0.12	0.15	0.20
	0.75	0.17	0.21	0.27
	0.60	0.25	0.31	0.41

$$\hat{E}_j = \left[\sum_{k=1}^9 \hat{N}_{j,k}/n_{j,k} \right] / 9 = 0.23$$

In 2007, 871 tagged smallmouth bass were translocated to Elkhead Reservoir.

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In 2007, 871 tagged smallmouth bass were translocated to Elkhead Reservoir.

Estimates of escapement are similar to Lucas and White. Lower post-construction escapement, but escapement has continued at a relatively high rate. The estimates of escapement of more recent cohorts will increase over time as more of those fish are captured. André said the escapement estimates could be improved by weighting the 9 different scenarios of tag retention and survival.

Aaron asked if probability of escapement based on spill duration is accounted for in the model and André said it is, in part. Melissa noted in some years, fish were not translocated until after the spill.

- G) 2011 sampling & mark-recap in Elkhead Reservoir (Wright, 15 min.) Handled 590 pike (21% of estimated population) and found a high density of northern pike in Elkhead (concentrated in upper end of the reservoir), with more large fish than previously thought (population estimate of 2,872 pike >300mm). For smallmouth bass (concentrated in lower end of the reservoir), the population estimate was 1,997 fish >150mm and 1,029 fish >200mm. Estimated 111 SMB remaining of 1,604 translocated in 2009 and 2010. Billy asked how far the reservoir would need to be drawn down to make the upper northern pike area inaccessible; Ray Tenney explained why that wouldn't be possible based on timing and magnitude of inflow.
- H) 110: -Yampa R.- Dinosaur NM SMB removal & SMB encountered during White River Colorado pikeminnow population estimate (Jones, 15 min)
Annual report at <http://www.coloradoriverrecovery.org/documents-publications/work-plan-documents/arpts/2011/nna/110.pdf> Tagged 18 subadults and 35 adults; very low recapture rates, so couldn't generate a population estimate. All metrics of fish caught this year were fairly low. Most movement into Yampa Canyon was from upstream in Lily Park. The 2007 cohort is still prevalent in captured fish (~225mm), but numbers reduced from previous years. Flannelmouth and bluehead suckers remain the largest component of the fish community. Also sampling *Gila* (mostly roundtail, one bonytail – stocked in 2010 in Echo Park) (and believe they've seen more smaller chub in recent years). In White River Colorado pikeminnow population estimate sampling, 60 adult and 22 subadult smallmouth bass were caught in 3 passes of 104 river miles sampled April to May (compare to one adult smallmouth bass captured in Cowboy Canyon in 2008). Sources could be the Green River, Kenney Reservoir, or Rio Blanco/upper White River. CPE of 0.43 fish/hour (compared to 1.5 to 1.9 in the Yampa and Green; however, but Boyd Clayton suggested that Yampa catch rates would be much lower in April to May). Boyd said he never caught a smallmouth bass the work he did in Kenney or Rio Blanco, but they have been in the river (and just below the Kenney spillway).

11:15 AM

- I) Yampa River/Elkhead Reservoir SMB group discussion (45 min.)
- 1) Yampa R. Surge utility & optimization. André said the significance of the surge is timing (increasing recapture rates) and nest disturbance.
 - 2) High flows & flow releases from Elkhead to extend SMB removal & extend nesting disruption

- 3) Addressing SMB escapement from Elkhead Reservoir. Pat asked about total propagule pressure; **André recommended that the managers meet to review these numbers and model scenarios.** Pat opined that André’s model runs suggest that escapement could potentially be resulting in as many as 20 fish per mile in the Yampa River. Pat asked if there’s a way to determine how many fish in the model runs would be coming from Elkhead. André said he thinks he could make some projections. André said the report on this project is in preparation.
- 4) Adjustments to Yampa River SMB removal? Melissa asked if **some of the effort might be moved up into Lily Park.** Tildon said they’re already planning to reduce the effort in Yampa Canyon, but he wouldn’t recommend reducing it further. Dave Speas suggested that we now understand more about what we can do with electrofishing and our current sampling is probably the minimum necessary to maintain smallmouth bass populations at current levels. John Hawkins noted that removal efforts early on were really baseline data; only since 2009 have removal efforts been enough to see responses in and around LYC. Pat said that on a depletion-based approach, we have not achieved a maintenance level; therefore we need to address sources (e.g., Elkhead, upstream area above Craig). Tom Chart agreed, noting that the “backfill” in LYC continues. We need to understand how much each source is contributing to that backfill if we’re to get ahead of the game and eventually get to a maintenance level. Krissy questioned the marking passes (are they still needed now that we have capture probability information).

12:00 Noon – 1:30 PM: Lunch

1:30 PM (moderator – Travis Francis)

- J) **115: Green R.- Lodore & Whirlpool canyons piscivore removal, 2002 to 2011 (Bestgen et al. 15 min.) Annual report at <http://www.coloradoriverrecovery.org/documents-publications/work-plan-documents/arpts/2011/nna/FR-115.pdf> Recommendations including evaluating flow or water temperature management to disadvantage smallmouth bass reproduction. One smallmouth bass escaped from Elkhead was found in Lodore this year. Melissa noted that we have difficulty pinpointing all the sources of nonnative fishes, but we do know fish are escaping from Elkhead; therefore she believes we should **rotenone Elkhead Reservoir to eliminate this source of smallmouth bass and northern pike source (and we should do this soon, given the risk of losing rotenone as a potential tool).**
- K) 123a: Green R.- Echo-Split SMB/WLY removal (Jones et al., 15 min.) Annual report at <http://www.coloradoriverrecovery.org/documents-publications/work-plan-documents/arpts/2011/nna/123a.pdf> Low number of recaptures, so no population estimate could be generated. 123 adults and 133 subadults were

removed. CPE has been declining by about half each year. 255 *Gila* captured (most <100mm, including 2 bontyail from Echo Park 2010 stocking). 13 northern pike were captured (1 of which was tagged in the Yampa in 2006). Also 26 walleye and 561 white sucker (some of which were white sucker hybrids). Tom Chart asked if we could reduce the effort further here in 2012 in light of low catch rates; Tildon thought that might be reasonable.

- L) 123b: mid-Green R. SMB/WLY removal (Skorupski et al. 15 min.) Annual report at <http://www.coloradoriverrecovery.org/documents-publications/work-plan-documents/arpts/2011/nna/123b.pdf> Large subadult population (especially below the Duchesne River) and a somewhat lower adult population. 2010 and 2011 exploitation rates reduced, likely due to sampling a larger area. Had higher capture rates when they eliminated (due to adverse weather conditions) a 43-mile section on the last pass. Also captured 40 walleye. Joe believes they can maximize time and increase efficiency in this project. Recommend 8 passes total: 4 complete passes, four passes in concentration areas (double effort below the Duchesne River), and possibly get a depletion estimate. They'd also like to do a successive mark-recapture pass to get a more robust estimate from the Duchesne to Tabyago. The Duchesne River may be a smallmouth bass source population.
- M) 123a: Green R.-Deso SMB/WLY removal (Badame et al., 15 min.) High water delayed summer work. Removed 421 bass. Again, Duchesne may be source. Also seeing increasing walleye (all adults, though) (source could be Duchesne or Lake Powell; need to determine).
- N) 126a&b: Colo. R. centrarchid removal (Burdick et al., 15 min.) Annual report at <http://www.coloradoriverrecovery.org/documents-publications/work-plan-documents/arpts/2011/nna/126ab.pdf> Sampling schedule was adjusted to accommodate high flows. Largemouth bass CPE declined in 2011. 2011 produced the weakest smb year class of the 2004-2011 study period. Due to budget cuts, the plan is to reduce 2012 passes from 10 to 5. Doug Osmundson said they captured 46 walleye and 101 gizzard shad downstream of Westwater in 2010 Colorado pikeminnow population estimate sampling. Paul Badame said they're catching thousands of small gizzard shad in their sampling.

2:45 PM: Break (15 min.)

3:00 PM

- O) Green SMB/WLY & Colorado SMB group discussion (45 min.)
- 1) Effect of high flow on SMB in Green & Colorado rivers
 - 2) Suspected sources of SMB - With regard to the Duchesne, it seems too sandy to be good spawning habitat. Access is an issue in the Duchesne, though.

- 3) Adjustments to Green/Colorado river SMB removal – Consider reallocating 123 effort from the upper to the lower reaches (maybe just sample Island Park through Split Mtn. in the upper reach). Where we're marking so few fish, a marking pass may not be worth the effort. Tildon also suggested timing the passes carefully for maximum effect. Melissa asked if it would be helpful to move some passes to Lily Park if issues could be worked out with the landowner. John said they're launching on private property 95-98% of the time now. John observed that it might be more useful to focus on the source (e.g., Loudy Simpson to Juniper), not the sink (Lily Park). The group discussed access and equipment issues. Paul Badame suggested UDWR move their effort downstream. Pat and Harry and others discussed the closure of fishing below Taylor Draw Dam. Pat wants to make sure there's no bag limit there, but there's also been a seasonal closure intended to protect Colorado pikeminnow. Tildon said he thinks there is a fence that partially blocks access. **Pat would like the protective regulations in the reach below Taylor Draw to be clear.**

- 4) Increasing WLY in Green (and Colorado) River? Releases from Starvation Reservoir began pretty early this year (just before or during when they caught walleye in Desolation). It may be that walleye get into the network of irrigation canals and get flushed out in the spring. **Aaron asked how much would it cost to determine the source via otoliths? There also will need to be more elements identified between Powell and Starvation because they found similarities between those two.**

- 5) Time for a **WLY Summit**? Perhaps. Pat said that both northern pike and walleye showed that they can establish a population at lower levels than smallmouth bass.

3:45 PM: Break (15 min.)

4:00 PM

4. Review of impetus & status of UCRB electrofishing fleet standardization & evaluation of the Midwest Lake Management, Inc., MLES Infinity Box & other electrofishers (Martinez & Kolz, 45 min., including discussion)

- A) Standard electrode configuration
- B) Electrofisher brand & model for standardization
- C) Use of FLUKE meter/current clamp or electrofisher meters to identify power (wattage) requirements
- D) Two new boxes tested: MBS' ETS unit (some presently in use in UCRB) and MLES and these have a greater flexibility, although the MLES will be limited for rafts. So, GPP and MBS' ETS unit are the two viable options for the Program. ETS is less expensive. Kevin said ETS is very accommodating of users. Pat summarized disadvantages of the GPP: it doesn't have meters, it has a

proprietary generator, and it can't operate at the preferred lower frequency and sustain the duty cycle. Tildon added that he doesn't think it works very well at higher conductivities. Cameron noted how differently smallmouth bass react to electrofishing. Matt Breen observed, however, that the GPP may be outfishing the ETS and will provide the data sheets to Pat and Larry. **Matt said it would be helpful if Larry could get in the field with them, as Pat suggested.**

André noted that catch per effort is affected by changing settings (and, of course, by operator, etc.).

5:15 PM: Adjourn

Thursday, December 8, convene 8:00 AM

8:00 AM (moderator - Pete Cavalli)

- 5. Understanding the spectrum of aquatic invasive species management: prevention, control & eradication (Martinez, 20 min., including discussion)** Goal is to move control to the “spare tire” role, to be implemented when prevention fails. **Prevention should be in the “steering wheel” role.** Continuum of prevention – control – eradication. Currently, we are primarily investing (heavily) in control. Dave Speas – what’s the rapid response on the White River. **Pat said he’s suggested no protective regulations for smallmouth bass (Taylor Draw). Tamara asked if education is part of the strategy; Pat said yes and that he thinks it needs to be much more consistent.** Tildon said Utah has done a great job of making anglers part of the solution to burbot, but some publications also tout how great they taste and how fun they are to fish for, which could unintentionally encourage illegal stocking. **Careful that in attempting control, we don’t create a new demand.** Thinking of the northern pike found near Rifle this year and our lack of rapid response, Anita asked if under Pat’s proposal of designating nonnatives as “bio-pollutants,” would another agency/entity be the one to respond to these kinds of events? Pat said that to draw a comparison, if there’s an oil spill, the oil company or contractor is expected to be the first one onsite to address the problem. Melissa noted that Pat mentioned Elkhead as an example of where we’re not following our own advice. We created northern pike spawning habitat there, we have extensive data about escapement, and we’re complicit in the problems it’s causing; therefore, **Melissa suggests that it’s time to move to eradicate fish from Elkhead with a piscicide.** John Hawkins suggested that it’s time to prioritize based on greatest threat and where we can have the greatest effect for the money. Tom Chart recognized that there is a healthy sense of urgency so that we can get to recovery by 2023, but thought that the Program had made many steps toward efficiency over the past 5-6 years. **Chart agrees that Elkhead is a source area we need to deal with, but recognizing the complexity of this action indicates that it is going to take a lot of planning (e.g. working with our partners to find a compatible fishery to replace what’s there now).**

3. Discussion of recommendations from first day: (NNFSC to review and make assignments)

SMB Model:

- Group to discuss scores table to add or subtract criteria, weight criteria differently, etc., since that is how structured-decision making is generally done
- Proxy parameter to discern environmental vs. removal effects on SMB density. Such as date of spring peak, or days earlier (+) or later (-) than average peaksend ideas to André (André working on, but appreciates any ideas)
- We will need to revisit our interim target of 30 adults/river mile.

Elkhead:

- Managers need to meet to review smallmouth bass escapement data and model scenarios
- Make projections to estimate how many fish in the smallmouth bass model runs would be coming from Elkhead (André will do; e.g., of ~800 fish in 2007 cohort, ~200 escaped, and ~100 would be expected to have gone to Little Yampa Canyon).
- Rotenone Elkhead to remove it as a source of smallmouth bass and northern pike. Harry said CPW is not close to that at this point. Chart – but it is a recommendation from the workshop to go to the Biology Committee. Sherm said that if this is a recommendation from the workshop, there will also need to be a Program willingness to fund it.

125 and 98a:

- Intensive removals in LYC needed because it is a concentration area that continues to attract SMB from other reaches
 - Uncertainties: how much more intense? Effort? Timing?
- Continue surge, but optimize. André said the significance of the surge is timing (increasing recapture rates) and nest disturbance. Aaron could conduct a surge effort on northern pike early in the season.
- Uncertainties
 - Shift effort from earlier to later? Maintain earlier and maintain extension to later?
 - Is surge flow-limited, equipment-limited, personnel-limited, and/or funding limited? Using flows from Elkhead to extend sampling season (since capture probability increases later in season)?

Adjustments to Yampa/Green SMB removal:

- 123a (Echo/Split)
 - Reduce effort further in 2012 in light of low catch rates and replace marking passes with removal passes since no pop estimate possible in 2011
 - Reallocate effort elsewhere
- 123b (Split to Tabyago)
 - Recommend 4 full passes and 8 passes in concentration areas below Duchesne, including successive mark/recapture passes below Duchesne

- 115 (Lodore/Whirlpool)
 - Evaluate flow and water temperature management to disadvantage SMB reproduction
- 126 Colorado
 - 2012 plan is to reduce passes from 10 to 5
- If discontinue marking passes in Yampa Canyon and Echo/Split & use CPUE – André said this can be justified where not getting enough recaptures, but **don't** apply this widely.) Tamara suggested that it seems like there should be a threshold established below which we don't conduct a marking pass. Tildon – this is on a year-by-year basis, can really only base on the year before.
- Reallocate some effort to Lily Park. Speas – high density in Lily Park, but views concentration of juveniles in Duchesne similarly.
 - From Yampa Canyon ?
 - Tildon recommends not reducing YC any more than planned
 - Discontinue marking passes in Yampa Canyon and possibly Echo/Split, and use CPUE
 - From Split? Possible
- Vs. Don't reallocate to Lily Park, other possibilities suggested include:
 - additional work in LYC
 - Loudy Simpson to Juniper (RM 90-40?)
 - Reallocate from upper reaches to lower reaches (e.g. Island park to Split), and time carefully
 - Reallocate to below Duchesne and into Deso ~20 miles

Other:

- White – Clarify protective regulations – make sure the no bag limit for SMB applies to closure area below Kenney Reservoir. Question for NNFSC – Is removal effort adequate?
- Duchesne
 - Determine sources of Walleye using otoliths
 - First, identify differences between Powell and Starvation reservoirs
 - Walleye/Burbot Summit is needed. Who would like to host? Krissy noted that UT is willing to step up and treat Red Fleet Reservoir now if they could get some assistance.
- Electrofishing
 - Larry join field crews for field testing (Breen & Wolford)
 - Include standard electrode configuration in permits for electrofishing in critical habitat
 - Decide on use of GPP 5.0 or ETS-1D-72A for future purchases of replacement electrofishers. Tildon asked if it's realistic to request replacement units. Reluctant to budget for GPP if we're going to switch to ETS. Pat – bench tests say either should work across the conductivities, but field reviews mixed, so we do need to get Larry out to join field crews. **DECISION: BUY ETS AS YOU NEED REPLACEMENT EQUIPMENT, NOT GPP AT THIS POINT.** Will this impact endangered fish population estimates? Kevin Bestgen

said the key – no, catch fish. PI's to let Pat know in a week how many replacement units they need; Pat will check on potential bulk discount. Sherm – slow turnover will compromise crew efficiency somewhat until we get to 100% turnover.

To have revised SOWs at BC in late January, >NNFSC will need to review the recommendations with PIs.

8:20 AM

6. Northern pike (NOP)

- A) 98b: Yampa R.-“buffer zone” NOP removal & translocation above critical habitat (Webber, 15 min.) Annual report at <http://www.coloradoriverrecovery.org/documents-publications/work-plan-documents/arpts/2011/nna/98b.pdf>

No mark-recap this year, used depletion estimator instead. Removed or translocated 525 fish. Surprised to find spawning in mid-July in some of the larger fish. Captured 22 tagged fish (mostly from Boyd's downstream reach): 1 from Catamount; 1 from Elkhead. One NP with left pelvic fin clip (probably from State HQ pond). 37 SMB, of which 8 were Elkhead escapees. **Recommend:** 1) reduce passes from 7 to 5; 2) conduct as early and late as possible; 3) stop all translocation of northern pike for 1 year, inform public why, reevaluate next year; 4) consider rotenoning Elkhead to eliminate pike and bass source.

Thunder Ranch – lots of northern pike found there this year (50 pike first day 40 the next) 19 the next week. Last year didn't find any. **Hot spot to address: net? Rotenone? Nothing?**

With regard to recommendation to cease translocation for at least a year, Boyd suggested that one fish may not be considered enough documentation that fish are being illegally moved. Harry said he's not ready to take a position on this. Billy noted that the State Park HQ ponds are important educationally (and if folks want to move pike illegally, there are other sources they'll go to). Sherm agreed, and suggested this is not the place to make an example. Pat added that temporarily halting translocation was not as difficult administratively as closing HQ pond to fishing or implementing a must-kill regulation for northern pike, either of which may require commission involvement. Anita – Why not expand the “don't move a mussel” campaign to “don't move anything!” We need to emphasize that bad behavior is not acceptable and expand our educational programs. Billy asked if Aaron could develop a plan for education on this. The group discussed education.

- B) 98a: Yampa R. NOP removal & translocation within critical habitat (Wright, 15 min.) Annual report at <http://www.coloradoriverrecovery.org/documents-publications/work-plan-documents/arpts/2011/nna/98a.pdf>
Abundance estimates of 7.7 NP/mile remain above interim goal of 3 NP/mile. Size structure smaller than previous years. Saw YOY appear in Juniper reach in 2011. Didn't catch any translocated escapees in 2011. Documented escapement

- of one pike from Elkhead. Surge accounted for 48% of pike removal. Juniper has highest pike catch rates (which are highest at low flows). Has provided insight into pike reproduction possibly occurring in the Juniper reach. **Recommend continue to focus effort during lower flow periods; use surge to continue to document presence/absence of YOY; maintain landowner contacts.** Sherm asked about general trend regarding private land access and Boyd said it's unchanged. Kevin – think the length frequency illustration is a result of environmental conditions this year; the floodplain inundated long enough to allow fish to survive. Also shows that the 300mm Thunder Ranch fish easily could have been produced this year.
- C) Upper Yampa R. reservoir & floodplain NOP control (Atkinson, 15 min.)
Yampa SWA ponds close to breach, so they shored up the bank and plan more extensive repair in 2012. Low numbers of pike captured pre and post-runoff; not serving as nursery habitat. Permission secured to start a study of the South Pit below Lake Catamount (private water) next summer (it breached at high water this year.) He also just got permission from the town of Oak Creek to treat Chapman Reservoir this winter (with spring follow-up, if needed). Stagecoach pike catch rates continue to decline, but walleye numbers are increasing. Catamount: 1,657 pike removed in 2011. Spring trap netting important (just as ice is breaking). Added small-mesh gill nets to the fall electrofishing this year.
- D) 115: NOP abundance & spawning phenology related to flow in the Upper Green R., Browns Park (Wilcox et al., 15 min.) 22 adults and 25 juvenile pike caught in Brown's Park in 2011. Extra sampling of Beaver Creek area and other probable spawning locations in Brown's Park. Ten Colorado pikeminnow captured. Extended high flows may have been beneficial to pike. Greater use by pikeminnow. **Need to continue sampling; make sure it doesn't become a pike source and determine pike repro timing. Continue to monitor pikeminnow use.**
- E) 123b: Green R. NOP removal (Skorupski et al., 15 min.)
Low abundance, large individuals, most caught during smallmouth bass removal. Low numbers being maintained, but **perhaps should shift time to a little earlier, focus more on mainchannel and perhaps some additional locations (e.g., Thunder Ranch outlet).** Tributary sample sites appear to overlap with Bestgen's sites and former razorback sampling sites. Joe – think they did capture some razorbacks, but very few. Matt said they caught one pikeminnow. >Joe will look into this.
- F) 126a: Upper Colorado R. NOP captures (Burdick et al. 15 min.)
11 adult pike caught, 9 pike caught in a very short time in 2011 in the Rifle-Parachute 17-mile reach (.005 pike/hr before to .71 in 11). **Recommend increase # of removal passes from Rifle to Beavertail to determine extent of pike occupation. Sample 7-mile reach between Silt and Rifle. Evaluate the feasibility of sampling floodplain ponds, especially gravel pits in Silt-Rifle area to determine species composition. Do otolith analysis to determine origins of pike collected.** Tildon asked if Rifle Gap has pike and Bob said it does. Lori Martin said that

Crawford Reservoir, Yampa River, and gravel pit ponds are other possible sources. Lori noted that since several pike were found right below a bridge, illegal stocking is another potential source. Sherman – Lafarge ponds connected this year. CPW is building a screen below Rifle Creek reservoir. **Willing to partner with Program to get the otoliths analyzed.**

- G) 161b: NOP data synthesis summary (Zelasko, 10 min.) Annual report at <http://www.coloradoriverrecovery.org/documents-publications/work-plan-documents/arpts/2011/nna/161b.pdf>

Pike removal efforts have varied in effectiveness and intensity. Preliminary data summary. Next work is on abundance trends, immigration, and environmental effects.

NP (captures + recaptures)

Reach	Year								total
	2003	2004	2005	2006	2007	2008	2009	2010	
Hayden to Craig	856	1355	1407	695	677	475	449	890	6804
South Beach		270	95	89	297	76	146	237	1210
Little Yampa Canyon	283	260	343	275	351	254	250	253	2269
Juniper	40	63	64	62	84	44	37	27	421
Upper Maybell	94	141	84	119	139	125	95	125	922
Lower Maybell	28	41	25	66	55	25	29	13	282
Sunbeam	5		8	11	33	10	15	12	94
Lily Park	52	55	28	21	19	35	26	29	265
Yampa Canyon	1	9	8	11	8	3	8	4	52
total	1359	2194	2062	1349	1663	1047	1055	1590	12319

- H) Walton Creek – CPW investigating opportunity to partner with City of Steamboat Springs (was 2nd highest ranked by CPW on the list they provided to the Program) Southern edge of SS, confluence of Walton Cr and Yampa. Historic gravel operation that was not reclaimed, contains significant backwater habitat, proliferates nonnative fishes and creates problems with river, overall. Steamboat has submitted a project as part of their Yampa River master plan in response to GOCO request for concept papers. Concerns include: 1) does it fit within overall nonnative fish strategy (he believes it does); 2) potential upstream flooding (flood permits would have to be part of project, but Billy thinks the project would actually help passage of water during high flow conditions); 3) pike potential to recruit from disconnected wetlands during subsequent high spring flows (Billy thinks they will dry up...); 4) responsibility for O&M (think that would be Steamboat); 5) Ski Corps water needs (will need to address); 6) liability (probably City); 7) FEMA & COE permitting issues (will have to go through the process); and 8) would it trigger NEPA compliance on whole GOCO grant application and who would be responsible for NEPA compliance costs (think it would be just project-based). Billy believes all of these concerns are typical of projects like

this. Harry working to set up conference call with Steamboat; would need to know if Program would be interested (contingent upon our concerns being resolved in a feasibility study) by January 20. Krissy said the proposal would still need to come back to the Biology Committee and they'd need to know the amount being requested. Harry – Thinks it will be ~\$200K request to Program. Tom Chart said he thinks his office has the list of checkpoints they need to discuss this with Steamboat.

10:00 AM: Break (20 min.)

10:20 AM

I) Northern pike group discussion (50 min.) to address:

Connectivity of Rifle Gap has been raised; if it's not connected, raises question of Harvey Gap and floodplain ponds. Need to get signatures from suspect source waters. Lori clarified that she's not saying there's no connection between Rifle Gap and the river, and don't know that floodplain ponds may be a source, but need to investigate. Harry said that CPW needs to get the Rifle Gap fish screen in ASAP. Pat noted that screens do have maintenance issues and overtop, so we still need to think about future fishery in Rifle Gap. Sherm – how do we get the otolith microchemistry done? >Harry and Pat will talk to Brett and find out. Anita said they found northern pike in a pond where they wanted to stock grass carp and the landowner felt it came in with irrigation water (he thought from Harvey Gap); in any case, little fish move all over the place in via irrigation water. We need to deal with source populations in Harvey and Rifle Gap reservoirs. Northern pike may be exiting reservoirs, reproducing in these ponds, and then getting into the river. Harvey and Rifle share a water source, so they have a similar chemical signature. Dave Speas noted that it will be pretty tough to do anything below those reservoirs. Melissa said we need to be looking at prevention in all of these areas. Sherm would like to do microchemistry to determine if they came from somewhere else entirely (e.g. illegal introduction). Krissy suggested that more immediately, we need to determine what we're going to do next year to prevent an explosion in this area like we've seen in the Yampa; think we need to focus on controlling these fish in this area next year. Tom Chart asked if northern pike in the Colorado would be a higher priority than walleye in the Green River for otolith analysis? Sherm said CPW is willing to partner in otolith analysis; Krissy will see if UDWR might be, also. Start with pike, and then move down the priority list.

Dave asked about the RM151 backwater in the upper Yampa. Sherm said this is where Reclamation engineer's suggested we could do more damage than good. Timing of sampling and shifting focus... Thunder Ranch – recommend that we get those fish out ASAP. Can Thunder Ranch be pumped down before netting in March to increase effectiveness? Tildon said we need to compare the costs between rotenone and netting. Krissy and Trina

reviewed steps that have to be taken in rotenone permitting process with EPA. Tom noted that the area is also managed for wildlife, so have to be sure we don't affect those activities. Melissa Trammell noted that state requires certification to apply piscicides, recommends folks get certified.

- 1) Effect of high flow on NOP in UCRB – a benefit or detriment for this species?
- 2) Illegal movement of translocated NOP
- 3) Escapement of NOP from Elkhead Reservoir
- 4) Increase of NOP in upper Colorado River
- 5) Application of Catamount NOP control strategies for nonnative piscivores in other UCRB waters?
- 6) Elements of a useful NOP synthesis in addition to abundance trends, dynamics, and immigration from upstream sources

11: 10 AM

7. Native fish response

- A) 140: Response of Yampa R. native fishes to removal of nonnative piscivores: 2011 update (Bestgen et al., 15 min.) Annual report at <http://www.coloradoriverrecovery.org/documents-publications/work-plan-documents/arpts/2011/nna/140.pdf> Big decline in bass #'s in 2011 likely due to reduced reproduction and survival and perhaps surge removal. For many years, only found native fish in isolated pools, those numbers continued to increase in 2011 and native fishes in main channel increased significantly in 2011, and smallmouth bass decreased. Positive native fish response has been detected in four consecutive years beginning in 2008. Reachwide response due to flow/temperature. Higher treatment reach response due to removals. **Continue sampling early in season; continue effort in Lily Park and other reaches. Investigate base flow supplementation; continue bass early life history studies.**
- B) 138: Response of Green R. small-bodied native fishes to removal of nonnative piscivores (Skorupski et al., 15 min.) Annual report at <http://www.coloradoriverrecovery.org/documents-publications/work-plan-documents/arpts/2011/rsch/138.pdf> Some backwaters were too deep to sample this year. No YOY pikeminnow in 2011, but picked up some juvenile Colorado pikeminnow. Sampling other native species presence is vital. Large numbers of flannelmouth and bluehead sucker. **Presence/absence of nonnative fish in all backwaters might improve this dataset.** Found 30 YOY smallmouth, likely due to the high flows. Overall, very difficult to measure response with this “snapshot-in-time” dataset. **Plan to recommend a new study design to better detect fish response, habitat overlap. May suggest a control-treatment stratified design.** Tildon – last 3 years of high baseflow conditions stand out. Matt asked for input in response to their proposal to change study design? Tildon asked if the ISMP protocol ties their hands in this work; Matt said it does – it's, valuable work, but not the right design for this objective.

Matt would propose something more like what Kevin is doing with intensive effort in one reach. Melissa – applying a localized treatment in 12 miles probably wouldn't have the same effect in the Green River. Paul Badame noted that the timing is different, also. Tildon observed that the habitat is all backwaters in the Green. Kevin Bestgen said the question will be whether they can remove a significant number of the offending fish at the right time of the year. If not, perhaps just continue ISMP and rely on correlational data. Paul Badame suggested that they could use the natural break in the bass population above and below the Duchesne to see if they have an effect. Kevin Bestgen suggested starting slow by doing some earlier sampling in August to determine if there's a potential for interaction with bass.

11:40 AM

C) Native fish response group discussion (20 min.)

Travis: encouraged to see increase in *Gila* basinwide.

- 1) Effect of high flow on native vs. nonnative fishes
- 2) Discerning environmental vs, nonnative removal effect
- 3) Variable response among native taxa to removal/reduction of predation/competition by nonnative piscivores

12:00 Noon – 1:30 PM: Lunch

1:30 PM (Moderator - Anita Martinez)

8. Other nonnative aquatic species/techniques

A) 125: White sucker & common carp removal in the middle Yampa R. (Walford, 15 min.) About half the number of fish in the treatment reach now. White suckers a big problem in LYC. CPE for white sucker and hybrids has decreased in LYC and Lily Park. Big carp in LYC, but numbers caught are declining (also declining in Lily Park). WS and hybrids are a much bigger problem in LYC and carp are a bigger problem in Lily Park. Believe carp can be more or less eradicated from LYC. **Recommend continue this effort; tag carp with floy tags for movement studies in LYC control reach; consider PIT tagging flannelmouth and bluehead suckers in LYC; begin removals in other locations.**

B) 123b: Green R. white sucker removal (Breen et al., 15 min.)

Found one fish ripe in October! Employed a simple method for aging fin rays (comparable to otoliths, but cheaper and easier [and nonlethal]).

White R. update – no white sucker or hybrids observed in July; two white sucker and no hybrids in April/May, and no white sucker YOY observed in September.

Recommend continue early spring monitoring. Strategies to reduce mature fish and hybridization potential. Maintain effort in concentration areas and add early spring mainstem sampling (remove more mature white sucker, provide additional

information on white sucker maturity in Green & ripeness of fish through time, gain better understanding of movement during spawning season). Pursue fin ray aging? Aaron said he probably handled several thousand white sucker in the Green River wetlands.

- C) Crayfish control in Catamount Reservoir (Atkinson, 15 min.)
Rusty crayfish are native to the Ohio River basin. They've been finding big numbers in Catamount Reservoir and they are very fecund. Removed ~20K crayfish (rusty and non-rust) in 2010; removed almost 40K rusty crayfish in 2011. Don't know if they've realized a depletion. Will work with Gary White on depletion estimate. Discovered rusty crayfish in Stagecoach in 2011. Nine trapping events captured almost 12K, 24% rusty (removed). Means of invasion unknown at this time. **Tamara asked why they return the non-rustys (since none are indigenous) to the marina area instead of just removing them.** Billy said they thought the non-rustys might help control the rustys.
- D) Strontium isotope signatures (Wolff et al., 15 min.) (Wolff couldn't attend due to illness) Reservoir risk component will be part of the final report, due in January. Both Brian and Brett are expected to be at the January researchers meeting.
- E) The invasion of illegally introduced burbot in the Green River basin (Gardunio et al., 20 min.)
Many burbot populations are extirpated, endangered or at risk in their native range. In Wyoming, burbot are native on the east side of the Continental Divide. They were first detected on west side in 2001. Detected in Green River in 2003 and in the Green River downstream of Flaming Gorge in 2009. Crayfish are a common food source. Smallmouth bass population declined drastically in Flaming Gorge after burbot became established. Younger age classes of native suckers missing in 2009 in the Big Sandy River. Burbot are likely to escape from Flaming Gorge and be added to the host of nonnative predators. Monitoring: lag phase in which sampling is difficult; trammel nets have proven effective in lakes, baited hoop or trammel nets in rivers. Mitigation: angler harvest, mechanical removal, target spawning aggregations, fish barriers. Habitat doesn't appear as favorable in the Flaming Gorge canyon section. Appear to be seeing some native sucker response to burbot removal in the Big Sandy. **Future direction: quantify potential for further downstream invasion in the UCRB; examine optimal sampling strategies; compare control methodologies; quantify impacts of burbot invasion.** Trina asked how active they are in the winter (they're not too active in Flaming Gorge in the summer). Eric said that hasn't been evaluated for this population. Elsewhere, they're very active in the winter, but inactive and living off energy stored in their liver in warmer temperatures. This may not apply to this population, however. The bigger concern might be what they're doing in the winter when other fish are inactive. Can larvae be captured with light traps? Eric – yes, during larval stage they are attracted to light. (But doing this in winter could be difficult).

2:50 PM: Break (15 min.)

3:05 PM

F) Other species/techniques group discussion (40 min.) to address:

- 1) Is work needed to evaluate white sucker hybridization as a threat to razorback sucker? **Should we be removing WS in other reaches? Aaron likely would catch thousands in the upper Yampa River. Disposal could be a challenge. Maybe a South Beach and downstream buffer zone? Pat asked about removing them at a level that doesn't overwhelm other work. Think they're more vulnerable than we've previously thought. Sherman said that the collection permit would say take them to the dump, rather than burying them (due to expected total biomass). Billy might be able to sample the State Wildlife Area.**
- 2) Are carp as vulnerable to removal in UCRB rivers as they appeared to be in the San Juan River?
- 3) Ongoing crayfish monitoring, research & control in UCRB.. Anita asked that with so many crayfish, if Billy is certain they didn't accidentally move any rusty crayfish to the marina when they gathered up the "non-rustys". Billy said they only moved mature crayfish where the markings are distinct. **>If researchers find crayfish in Yampa River below Billy's area, they should put it in alcohol, note UTM and let Billy know and get to CPW.** Pat recalled a paper that looked at potential compensatory response in smallmouth which also found that rusty crayfish and northernns don't have as strong of a compensatory response. **Pat said the crayfish in Colorado are the most invasive kinds and we shouldn't be putting any back that we remove. Sherm asked if we should continue this effort; Pat said he thinks Billy will know in a few years if he can be effective in controlling them. Group discussed potential to use public to control, but there are complexities.**
- 4) Implementation of microchemical techniques in UCRB. **Kevin said that Brian has samples to help resolve the question of Green River microchemical signatures below Flaming Gorge Reservoir. Pat said that going forward, we have to find funding to work on the stockpile of otoliths to be analyzed.**
- 5) Burbot invasive capacity in UCRB – what can/will we do? Group discussed gear types to target burbot in the river. Pat noted that a high density of burbot remains in upper reaches of the reservoir, if crayfish population there crash, burbot have the potential to wipe out the salmonids. Chart asked if we're seeing any indication that burbot are preferring higher elevations in the river above Flaming Gorge; Eric said it's hard to get at this in light of sampling difficulty, but thinks they may be able to survive warmer reaches downstream. Are methodologies being used in upper Green adequate to capture burbot? Perhaps not, since most sampling is electrofishing. CSU is trammel-netting in

the fall, but probably won't catch a 5" burbot. Aaron recommends angling surveys.

3:45 PM

9. Nonnative fish database formatting & handout (Francis, 15 min., including discussion). Deferred; handout provided.

4:00 PM

10. Wrap-up: comments on 2012 & 2013 budgets, nonnative species issues & workshop (15 min.). Angela Kantola reviewed the tight FY2012 and potentially tight FY2013 budgets and suggested creating two sets of priorities: 1) shifts within available 2012 budgets; 2) work beyond that for contingency projects. Tom Chart suggested, and the group agreed, not to repeat these individual project workshop presentations at the Researcher's meeting, but as in recent years have 3 programmatic presentations: smallmouth bass (André's Project 161 presentation should suffice); northern pike (Boyd's 98a presentation plus input Project 98b, the Green River Project 123b, and the Colorado River Project 126 – CPW said they would select a lead from their agency); and native fish response (Bestgen & UDWR). Additional presentations should be made on other nonnative species, and Pat should present on the draft basinwide nonnative fish strategy.

Adjourn 4:30 PM

ATTACHMENT A

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 2011 results.
- How do the PI's best get their message across?? Discuss additions, deletions, or modification of the 2010 data presentations. Please come prepared to discuss alternative approaches to data presentations. If we determine that the task this year largely consists of adding 2011 data to the 2010 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 2011 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 2010 presentations should serve as templates. If there are better ways to tell the story let's make the necessary adjustments, 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 – this should make for more powerful comparisons.
 - Continue to examine in detail the smallmouth bass and northern pike movement data.
- Native fish response data: consider the 2007- 2011 environmental conditions in relation to the small bodied fish sampling (including Projects 22f, 138, and 140.

- Discuss observations and results as they relate to the 2011 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 flow/temperature manipulations to disadvantage nonnative fish?

- 2012 Work Planning – as in 2011, 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 2012 Work Plan will have to be approved by the BC and MC.

Participants

John Hawkins	Colorado State University
Pat Martinez	USFWS, Recovery Program
Angela Kantola	USFWS, Recovery Program
Tom Chart	USFWS, Recovery Program
Joe Skorupski	UDWR
Matt Breen	UDWR
Brandon Albrecht	BioWest
Eric Gardunio	Colorado State University
Kevin Bestgen	Colorado State University
Tildon Jones	USFWS
Krissy Wilson	UDWR
Cameron Walford	Colorado State University
Shane Capron	WAPA
Jerry Wilhite	WAPA
Aaron Webber	USFWS
Sarra Jones	UDWR
Sherman Hebein	Colorado Parks and Wildlife
Dean Riggs	Colorado Parks and Wildlife
Harry Crockett	Colorado Parks and Wildlife
Steve Meismer	UDWR
Paul Badame	UDWR
Bobby Duran	
Ben Schleicher	
Anita Martinez	Colorado Parks and Wildlife
Doug Osmundson	USFWS
Billy Atkinson	Colorado Parks and Wildlife
Scott Durst	U.S. Fish and Wildlife Service, San Juan River Basin Recovery Implementation Program
Bob Burdick	U.S. Fish and Wildlife Service
Boyd Wright	Colorado Parks and Wildlife
Dale Ryden	U.S. Fish and Wildlife Service
Angela Hill	Colorado State University
Koreen Zelasko	Colorado State University
Kyle (Cal?) Tiggy	
Tate Wilcox	Colorado State University
André Breton	Colorado State University
Melissa Trammell	National Park Service
Dave Speas	Bureau of Reclamation
Travis Francis	U.S. Fish and Wildlife Service
Pete Cavalli	Wyoming Game & Fish
Tamara Nauman	National Park Service
Ray Tenney	Colorado River Water Conservation District
Jenn Logan	Colorado Parks and Wildlife
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