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Implementation of the 2009 Fish Protocol Evaluation Panel's Recommendations

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2009 Protocol Evaluation Panel for Fish Monitoring Programs

- Convened in May 2009
- Included formal presentations, discussion, and site visits
- Preliminary findings and recommendations presented to TWG in June 2009
- Report finalized in October 2009

Mike Bradford (Chair), Mark Bevelhimer, Michael Hansen, Gordon Mueller, Doug Osmundson, Jim Rice, Dana Winkelman

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Protocol Evaluation Panel's Findings

Main Elements:

- Institutional
- Glen Canyon (Lees Ferry) Monitoring
- Native Fish Monitoring
- Mainstem Colorado River Monitoring
  - Nonnative or Invasive Species Monitoring

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Institutional

- …develop a standardized framework for archiving data and reporting of monitoring results for key program elements.

Response:

- Impediments to data sharing have been removed
  - Use of Standardized Methods for Grand Canyon Fisheries Research
  - Shared data entry template
  - Central database maintained by GCMRC
- Annual cooperators meeting to share data and results and coordinate protocols and activities for coming year
- Some reporting has been standardized (trip reports), some has not (annual reports)

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Institutional

- …AMWG and GCMRC should convene a group of experts to advise them on likely future trends in conditions that will affect the Colorado River system (e.g., changes in temperature and precipitation, water withdrawals and diversions, reservoir levels, etc.) and use that information to identify probable bounds on management options for the future.

Response:

- 2010 and 2011 ecological modeling workshops
  - Objective: assess monitoring and research data
  - Participants: primarily researchers familiar with the system
  - Modeling: Ecopath and EcoSim platforms, included physical and biological data to explain and predict future trends for specific resources
  - Outcome: Korman et al. *In review*. Estimating Recruitment Dynamics and Movement of Rainbow Trout in the Colorado River in Grand Canyon using an Integrated Assessment Model. Can. J. of Fish. and Aq. Sci.

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Institutional

- …AMWG members participate in a Bayesian Belief Network exercise, or similar effort, to solidify their goals and reach consensus on how best to achieve them, in a way that takes into account their disparate individual needs, concerns and responsibilities.

Response:

- To my knowledge, the AMWG has not participated in this kind of exercise

GLEN CANYON DAM
ADAPTIVE MANAGEMENT PROGRAM
Using science to manage river resources in Grand Canyon

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Glen Canyon (Lees Ferry) Monitoring

- **Recast management objectives as angling catch rate, rather than absolute abundance, to frame the management program more directly in relation to the current catch-and-release angling fishery.**

Response:

- **To my knowledge, managers have not attempted to recast objectives as suggested**
- **Recommendation does not appear to consider issues related to the ecology and population dynamics of the Glen Canyon trout population or negative interactions between native fish and nonnative trout further downstream**

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Glen Canyon (Lees Ferry) Monitoring

- **Retain the creel survey to monitor annual fishery performance and angler satisfaction in relation to revised management objectives.**

Response:

- AGF funded from 1963 to early 1970s and late 1970s through 2011
- GCMRC provided a small amount of funding in 2011
- Efforts curtailed April 2012 due to lack of funding
- AGF has requested GCDAMP funds for the FY13-14 biennium

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Glen Canyon (Lees Ferry) Monitoring

- **Evaluate the effect of reducing electrofishing effort from 3–4 trips per year to 1–2 trips per year and eliminating fixed sites from the survey design to provide an index of trout population density based on random sites only.**

Response:

- **Effort maintained at three trips per year (spring, summer, and fall) to retain seasonal component in monitoring**
- **Design revised in 2010, random-stratified procedure to select all sample sites**

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Glen Canyon (Lees Ferry) Monitoring

- **Monitoring age-0 trout habitat use and movement is not routinely needed because the electrofishing survey provides a direct index of pre-recruit trout density. Similarly, redd counts are not needed because the electrofishing survey provides a direct index of adult trout density. This program's strength is in evaluating the impacts of flow manipulations on early life history, and it should be part of the evaluation of future flow tests.**

Response:

- **Provided information on effects of fluctuating flows and a controlled flood on incubation success, survival rates, and growth of age-0 rainbow trout (see Korman et al. 2011. Trans. Amer. Fish. Soc. 140:487-505) also early indications on effects of 2011 equalization flows**
- **Useful to evaluate effects of future HFEs or flow-related actions to manage Glen Canyon trout population**
- **Continued at minimum funding level through 2012, proposed to continue in FY13-14**

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Native Fish Monitoring

- **Sufficient information and experience with the LCR HBC population presently exists to develop an assessment framework. This framework would identify information needs and analysis required for managers to assess population status relative to management objectives.**

Response:

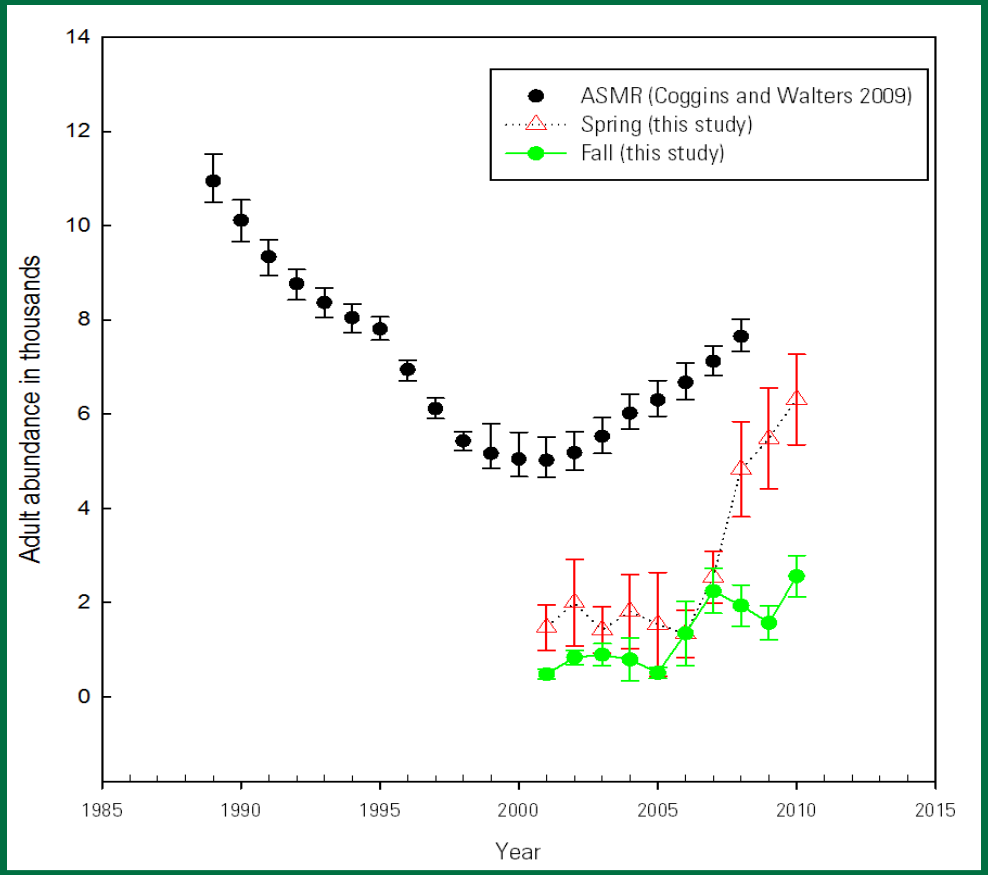
- **Formal assessment framework in development, draft report expected late 2012**
- **To date, information needs identified through more informal interactions among researchers and managers as well as events like Knowledge Assessment Workshops**

Native Fish Monitoring

- **In the context of the assessment framework, evaluate spring and fall hoop netting programs to assess the necessity of conducting both surveys.**

Response:

- **Assessment conducted as part of ASMR analysis (Martell 2010)**
- **Continuation of both programs important to maintain consistency with past data – findings presented to TWG in November 2010**
- **Both in FY13-14 workplan**



(Coggins and Walters 2009; VanHaverbeke et al. unpubl.)

Native Fish Monitoring

- Compare the spring hoop net data from the mark-recapture program to the fixed site 1200 meter hoop net data to determine if these programs are redundant.

Response:

- Direct comparisons problematic due to gear differences
- Makes it difficult to identify redundancies
- Preliminary comparisons of trend data suggests poor correlation of catch trends between projects
- In FY13-14 workplan

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Native Fish Monitoring

- **Expand the fixed PIT tag antenna array to span the entire channel and consider deploying antennas at two locations**

Response:

- **PIT tag antenna array expanded across LCR in 2011**
- **Second antenna array installed in May 2012**
- **Continued operation in FY13-14 workplan**

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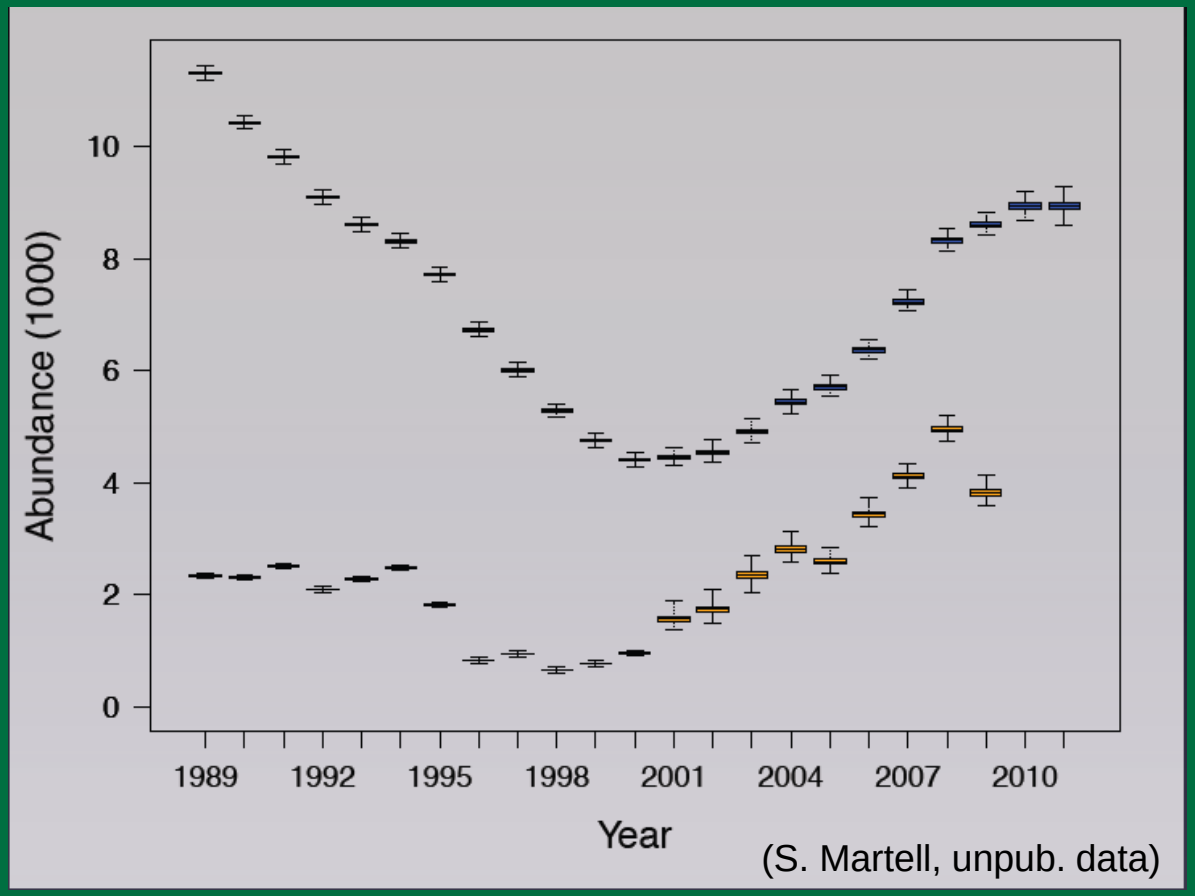
Native Fish Monitoring

- Reduce the frequency of ASMR updates from annual to every 3–5 years, unless trends in field data warrant a formal reassessment.

Response:

- ASMR updates currently scheduled every three years



(S. Martell, unpub. data)

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Native Fish Monitoring

- ASMR estimates of recruitment do not match hoop net catch rates because of age estimation error in the ASMR. Body parts from the HBC being collected in the nearshore ecology program or as part of disease sampling should be used (e.g. anal fin rays, scales, and otoliths) for age verification. Hopefully, verification would allow future non-lethal sampling for age estimation. Age estimates from fish tagged at small size (young “known” age) and recaptured over a wide range of years at liberty should be compared for age validation. Sensitivity of the ASMR recruitment index may be increased by using age information in combination with tagging of smaller fish.

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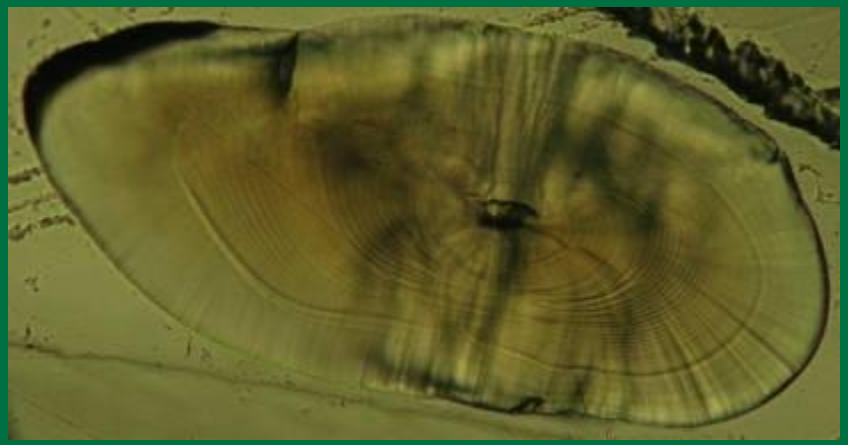
Native Fish Monitoring

- ASMR estimates of recruitment do not match hoop net catch rates because of age estimation error in the ASMR…

Response:

- Successful aging of HBC from NSE project using otoliths
- Otoliths also analyzed chemically to determine residence in particular waters (e.g., mainstem, LCR) – promising results
- Results from other hard structures (e.g., scales, fin rays) not promising, may try fin rays again as part of FY13-14 work
- Taking different approach to address ASMR issue – length-based model, avoids problems with age-estimation error



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Native Fish Monitoring

- **Management objectives for Chute Falls and other translocations should be specified in measurable terms to guide monitoring and reporting.**

Response:

- **To my knowledge, management objectives for these efforts have not been revised.**
- **Analysis of translocations within LCR currently underway**
- **Included in FY13-14 workplan**

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Mainstem Colorado River Monitoring

- The current stratified random electrofishing survey should be continued to provide information on trends and distribution of relatively abundant native and non-native species. However, effort could likely be reduced with little loss of information. This extensive approach needs to be complemented by a second strategy intended to detect rare species, such as more intensive sampling using a variety of passive and active gears at a smaller number of fixed surveillance locations where potentially detrimental non-native species are most likely to be found.

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Mainstem Colorado River Monitoring

- **The current stratified random electrofishing survey …**

Response:

- **Stratified random electrofishing survey continued, effort reduced to one trip per year**
- **Annual surveys for potentially detrimental nonnative species conducted each summer in Glen Canyon Dam spillway and in large backwater/slough at river mile -12.3**
- **2009 oar-powered survey using a variety of gears (electrofisher, trammel nets, hoop nets, seines) – catches generally low, project discontinued**
- **Additional sampling at fixed surveillance locations downstream not implemented as our focus has been on existing nonnatives, more frequent sampling of mainstem proposed for FY13-14**

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Mainstem Colorado River Monitoring

- Evaluate impacts of reducing river-wide electrofishing from 2 trips to 1 trip per year.
- Response:
  - To date, reduction in effort has not adversely affected information quality
  - High turbidity conditions could limit ability to detect trends

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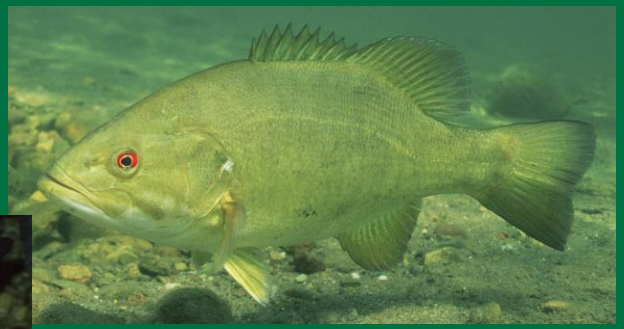
Mainstem Colorado River Monitoring

- **Add a targeted sampling program at likely locations for non-native species colonization (e.g. above Lake Mead, below Lake Powell, and stream mouths, springs, below large rapids).**

Response:

- **Annual system-wide electrofishing survey includes non-native fish monitoring – included in FY13-14 workplan**
- **Sites randomly selected, specific locations not targeted**



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Mainstem Colorado River Monitoring

- **Design a monitoring program for non-LCR HBC based on refined management objectives and CMINs that clarify information needs.**

Response:

- **Annual sampling of aggregations resumed in 2010**
- **One trip per year in September, catch per unit effort data from each aggregation**
- **Effort to develop more quantitative approach proposed for FY13-14 biennium**

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Mainstem Colorado River Monitoring

- **Alternative means of sampling should continue to be pursued to identify the most efficient means to detect new species and changes to the distribution and abundance of existing species.**

Response:

- **Continued to look for alternative sampling approaches to increase effectiveness and efficiency of all monitoring**
- **Proposals in FY13-14 workplan to experimentally evaluate alternative approaches – aggregation and natal origins projects**


Questions?
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