USFWS 2011 Report on Environmental Contaminants RIPRAP Activities

Note: this is an annual report from the U.S. Fish and Wildlife Service regarding its activities to address contaminant concerns outlined in the RIPRAP. Contaminants remediation is conducted independently of and funded outside of the Recovery Program.

II.B. Support actions to reduce or eliminate contaminant impacts

Pesticide exposure prevention The Grand Junction office continues to work with the local mosquito control agency to prevent mosquitocide exposure of endangered Colorado River fish in grow-out ponds (68 acres), as well as backwater and wetland habitat in approximately 30 miles of the Colorado and Gunnison rivers. The total treatment area is approximately 73 square miles, or a total of 46,720 acres.

Mercury exposure to the endangered Colorado pikeminnow The objectives of this investigation were to determine mercury concentrations in Colorado pikeminnow (CPM) collected from several different river reaches within critical habitat by using biopsied muscle plugs, and to develop a regression equation between CPM length and mercury concentrations.

An FY2011 interim report was submitted to the Service's R9, Division of Environmental Quality. A final report is being prepared for completion in FY2011. The Service presented the results of this investigation at the annual Colorado River Endangered Fish Recovery Program Researchers Meeting in January, 2010. Results will be presented to the Mercury Technical Advisory Council of the Colorado Division of Water Quality on December 6th.

The combined reaches of the Green River sampled covered nearly 205 river miles. The combined reaches of the Colorado River sampled covered nearly 80 river miles. The White River sampled covered nearly 103 river miles, the Yampa River sampled covered nearly 22 river miles, and the San Juan River sampled covered nearly 40 miles. Ten Colorado pikeminnow muscle plug samples were taken from river reach, with the exception of the San Juan River where 20 muscle plug samples were collected.

Beckvar et al. 2005 suggested a threshold-effect level of $\leq$0.2 µg/g wet weight (ww) mercury in whole body fish as protective of juvenile and adult fish. Compared with this threshold, mercury concentrations in Colorado pikeminnow were elevated. Colorado pikeminnow within critical habitats, and in larger fish collected from the San Juan River, are above this threshold that may be indicative of sublethal effects. Seventy-eight percent of Colorado pikeminnow collected (98 out of 126) had expected whole body mercury concentrations that exceeded Beckvar et al. (2005) threshold of effect level of 0.2 µg/g ww. Based on effect level ranges discussed in publications, 2 to 60 percent of the Colorado pikeminnow sampled have mercury concentrations in fish muscle or whole body that are associated with biochemical changes, tissue damage, and reduced reproduction in other fish species. Additionally, mercury exposure and accumulation was found in all subpopulations of Colorado pikeminnow sampled and throughout their critical habitat, which increases the relative risk of mercury contamination to the recovery of this species. Because of the high mercury concentrations found in roundtail chubs (0.11-1.97 µg/g ww, mean =0.6 µg/g ww) and Colorado pikeminnow (0.43-1.83 µg/g ww, mean = 1.1 µg/g ww) collected from the White River, we suggest that further investigation is warranted to assess potential

adverse impacts to these species, as well as determine the source of mercury contamination. The largest roundtail chubs contained mercury concentrations as high as those found in Colorado pikeminnow.

Salinity Coordinator The Grand Junction EC staff continues in their role as the Salinity Coordinator for the Service on the Colorado River Basin Salinity Control Program. This position is responsive to the request by various Federal and state and local programs to reduce salinity concentrations within the upper Colorado River Basin to meet salinity compact requirements with Mexico at the US/Mexican Border. Direct results of the Salinity Control Program are reductions in canal leakage, improved delivery systems, more efficient irrigation practices, and protecting wildlife habitat values. This program ties into the Aspinall Biological Opinion to reduce selenium concentrations in the Gunnison Basin with the ultimate effect of reducing selenium concentrations throughout the upper and lower Colorado River Basins.

Pariette Draw Selenium and TDS loads to Green River: The Pariette Draw is a tributary of the Green River that is not supporting its warm water fisheries and waterfowl beneficial use classifications due to violations of the criterion for selenium. The Utah Ecological Services (ES) Field Office worked with Utah Division of Water Quality to develop TMDLs for selenium, TDS, and boron in Pariette Draw. EPA has now approved the TMDLs and they include best management practices for mitigating the potential effects of TDS, selenium, and boron to Pariette Draw and Green River aquatic habitats. The Utah ES office is expecting to work with Utah Division of Water Quality, Utah State University, and other stakeholders in 2012 to conduct water quality monitoring and wetland and pond characterization in Pariette Draw Watershed providing funding from the state that was originally expected in 2011 becomes available for the 2012 field season.

II.B.1. Evaluate effects of selenium (Ongoing)

The Grand Junction EC staff has finalized a report titled *Water Quality Assessment of Razorback Sucker Grow-out Ponds Grand Valley, Colorado*. Selenium toxicity guidelines were exceeded in water, sediment, dietary items, and razorback sucker muscle plugs from several ponds (most notably Maggio and Clymers ponds), indicating increased risk of reproductive impairment. Stocked razorback suckers recaptured from the rivers at least 8 months post-stocking still retained high selenium tissue residues acquired from the grow-out ponds. River-stocked razorback suckers had significantly higher selenium concentrations than native bluehead suckers (*Catostomus discobolus*) and native flannelmouth suckers (*Catostomus latipinnis*) collected in the Colorado and Gunnison Rivers in the Grand Valley. The levels of selenium we found in razorback suckers are likely reproductively problematic. Management recommendations for grow-out ponds are presented to improve survival and condition of razorback suckers. Contact Barb Osmundson at 970-243-2778 ext. 21, or Barb_Osmundson@FWS.gov for a copy of this report.

II.B.1.a. Identify actions to reduce selenium contamination to levels that will not impede recovery (Ongoing)

Selenium Task Force The Grand Junction office continues to engage with the Selenium Task Force.

Technical Assistance The Aspinall Programmatic Biological Opinion (BO) was finalized in 2010. A Selenium Reduction Program was proposed in conjunction with the BO, to implement remediation projects associated with selenium exceedences in the Uncompahgre Project area and downstream. The Grand Junction EC staff has provided comments on the Aspinall EIS that is being developed during 2011.

The Grand Junction EC staff participated in the Recovery Program Aspinall ad hoc committee meetings to develop a study plan to evaluate effects of the Aspinall Unit Reoperations to benefit habitat and recovery of endangered fishes. Grand Junction EC staff submitted an off-refuge proposal in 2010 which was accepted for 2011 funding, to determine selenium concentrations in endangered fish in the Gunnison River, as well as surrogate fish species in the Gunnison River. While Colorado Parks & Wildlife and CRFP staff conducted endangered fish population surveys, muscle plug samples were collected for selenium analysis. Results from this selenium study will be used in the new Selenium Management Program (SMP) to determine baseline selenium concentrations and evaluate effectiveness of selenium remediation efforts. Selenium concentrations in endangered fish in the Gunnison River have not yet been determined. Selenium concentrations in surrogate fish species (roundtail chub, carp, and speckled dace) collected in 2010 and 2011 will be compared to the same species collected in 1992, to investigate any changes over the last 20 years and remediation efforts taken thus far by the selenium task force.

Selenium concentrations will be compared to toxicity reference values associated with adverse effects, in particular to those values associated with reproductive impairment. These tissue selenium concentrations will also be divided by water concentrations to determine bioaccumulation factors. The bioaccumulation factors will in turn be used to help assess load reductions needed by the Selenium Management Program (discussed below) in remediation efforts to minimize risk of reproductive impairment for the endangered Colorado River fish.

During 2010 fish population surveys conducted by the CDOW, muscle plug samples were taken from 15 roundtail chubs and 15 carp for selenium analysis. Fifteen whole body speckled dace were also collected for selenium analysis. Results are displayed in Table 1.

Table 1. Selenium concentrations in fish tissue collected from the Gunnison River. (Note: concentrations are reported on a dry weight (dw) basis.)

Species Name	Sample type	Collection Date	% Moisture	Selenium (µg/g dw)
Roundtail Chub	Muscle plug	07/21/10	79.3	12.76
Roundtail Chub	Muscle plug	07/21/10	78.9	5.32
Roundtail Chub	Muscle plug	07/21/10	78.9	7.78
Roundtail Chub	Muscle plug	07/21/10	78.0	6.96
Roundtail Chub	Muscle plug	07/21/10	78.2	5.80
Roundtail Chub	Muscle plug	07/21/10	79.7	10.78
Roundtail Chub	Muscle plug	07/21/10	79.2	8.00
Roundtail Chub	Muscle plug	07/21/10	78.1	9.45
Roundtail Chub	Muscle plug	07/21/10	77.9	6.45
Roundtail Chub	Muscle plug	07/21/10	77.6	8.26
Roundtail Chub	Muscle plug	07/21/10	78.5	8.03
Roundtail Chub	Muscle plug	07/21/10	78.2	8.83
Roundtail Chub	Muscle plug	07/21/10	77.5	32.35
Roundtail Chub	Muscle plug	07/21/10	78.4	8.65
Roundtail Chub	Muscle plug	07/21/10	78.4	6.39
Common Carp	Muscle plug	07/21/10	76.8	8.41
Common Carp*[1]	Muscle plug	07/21/10	77.2	13.47
Common Carp*[1]	Muscle plug	07/21/10	77.3	13.69
Common Carp	Muscle plug	07/21/10	75.6	20.44
Common Carp*[2]	Muscle plug	07/21/10	74.9	9.93
Common Carp*[2]	Muscle plug	07/21/10	75.9	10.00
Common Carp	Muscle plug	07/21/10	74.4	8.47
Common Carp	Muscle plug	07/21/10	77.3	12.75
Common Carp	Muscle plug	07/21/10	74.3	8.76
Common Carp	Muscle plug	07/21/10	74.4	9.41
Common Carp*[3]	Muscle plug	07/21/10	75.3	10.96
Common Carp*[3]	Muscle plug	07/21/10	72.5	10.05
Common Carp	Muscle plug	07/21/10	76.4	11.19
Common Carp	Muscle plug	07/21/10	74.6	16.51
Common Carp	Muscle plug	07/21/10	73.8	19.33
Common Carp	Muscle plug	07/21/10	76.0	15.43
Common Carp	Muscle plug	07/21/10	73.4	12.54
Common Carp	Muscle plug	07/21/10	75.2	11.70
Speckled dace	Whole body	07/21/10	67.2	8.29

Table 1. Selenium concentrations in fish tissue collected from the Gunnison River. (Note: concentrations are reported on a dry weight (dw) basis.)

Species Name	Sample type	Collection Date	% Moisture	Selenium (µg/g dw)
Speckled dace	Whole body	07/21/10	63.9	7.13
Speckled dace	Whole body	07/21/10	63.3	7.44
Speckled dace	Whole body	07/21/10	66.2	6.11
Speckled dace	Whole body	07/21/10	67.0	6.09
Speckled dace	Whole body	07/21/10	58.7	7.07
Speckled dace	Whole body	07/21/10	66.6	7.49
Speckled dace	Whole body	07/21/10	66.0	8.38
Speckled dace	Whole body	07/21/10	63.9	8.50
Speckled dace	Whole body	07/21/10	65.1	6.55
Speckled dace	Whole body	07/21/10	66.9	5.74
Speckled dace	Whole body	07/21/10	61.2	6.21
Speckled dace	Whole body	07/21/10	64.2	8.82
Speckled dace	Whole body	07/21/10	70.3	8.45
Speckled dace	Whole body	07/21/10	69.5	9.68

*[1,2,3] These samples are double replicates

Selenium concentrations in muscle plugs from 9/15 roundtail chub and all 15 carp collected in 2010 exceeded the 8 µg/g dw toxicity guideline (Lemly 1996; equivalent to 0.2 µg/g ww given a moisture content of 75%) for selenium in fish muscle tissue. These samples were collected from the upper portion of designated critical habitat in the Gunnison River from the Uncompahgre River confluence in Delta, CO (RM 56.3) to Escalante at RM 44.1. No endangered fish were encountered during this 2010 survey, so no endangered fish muscle plugs were collected. Selenium concentrations in all speckled dace samples exceeded the 4 µg/g dw selenium toxicity guideline for whole body fish (Lemly 1996).

Muscle plug collections continued this summer on the lower stretch of critical habitat in the Gunnison River between Escalante (RM 44.1) and the Colorado River confluence (RM 0.7). Muscle plugs were taken from 15 carp and 15 roundtail chub during July/August, and 15 whole body speckled dace were also collected. Muscle plugs were also collected from four bonytail. Samples have been shipped to the lab for selenium analyses.

Grand Junction EC staff have been involved in numerous planning meetings with the selenium task force and the Selenium Management Program work group to develop the Selenium Management Plan, along with the long-term plan. Discussions have included many stakeholders, and goals are to determine implementation schedules, benchmarks, responsible entities, monitoring needs, and coordination with ongoing Recovery Program activities.

The Grand Junction EC staff provided technical assistance to the Albuquerque ES office regarding the proposed coal-fired power plant, the Desert Rock Energy Project, and potential

effects to endangered Colorado pikeminnow and razorback sucker from aerial deposition of mercury and selenium into the San Juan River from the plant. Both offices have partnered to assess current mercury residues in Colorado pikeminnow.

Prediction equation for selenium in fish tissue A final report for the contaminant investigation entitled *Selenium in Fish Tissue: Prediction Equations for Conversion between Whole body, Muscle, and Eggs* was completed. We found that different fish species incorporate different selenium loads into eggs and ovaries, and this may not be apparent from looking at only whole body selenium concentrations.

II.B.2.a. Ensure that all new petroleum product pipelines have emergency shutoff valves (Ongoing)

USFWS Ecological Services addresses this through Section 7 consultation, although not all pipeline approvals have a federal nexus that results in consultation. USFWS should consider how best to address this concern.

II.B.2.b. Identify locations of existing petroleum-product pipelines potentially affecting critical habitat and determine if they have emergency shutoff valves. (Pending)

The Pipeline and Hazardous Materials Safety Administration has developed the Pipeline Integrity Management Mapping Application (PIMMA) for use by pipeline operators and Federal, state, and local government officials. This should be a valuable tool in assessing threats to endangered fish. USFWS should investigate use of PIMMA to address existing pipelines that may need shutoff valves.

II.B.3. Review and recommend modifications to State and Federal Hazardous materials spills emergency response programs (Ongoing)

Spill contingency response EC staff from Grand Junction and Salt Lake City maintain an ongoing presence within State and Federal hazardous materials spills emergency response programs. Through routine participation in response programs we review and recommend modifications to various response actions, contingency plans, and spill drills affecting the CO River and tributaries. We have recognized a need to update existing Sub Area Contingency Plans under the National Contingency Plan. EPA has the lead for developing and updating Sub Area Contingency Plans; we have informed EPA of the need to update plans associated with the CO River and tributaries. In FY11, the EC staff from Salt Lake City and Grand Junction assisted in updating the Green and Colorado River Sub Area Spill Contingency Plans.

The State of Utah holds annual multi-agency workshops, to plan for future emergencies, including spills and responses, review lessons learned, and promote better coordination among agencies during response activities. In FY11, USFWS participated on a panel on spill response and continued to work with the State to improve incident notifications, specifically regarding events that may affect DOI trust resources. Since the workshop, spill notifications have been provided in a more timely fashion and include information on whether spills have reached

surface waters and whether wildlife have been observed in the immediate area. Special notices have been provided to USFWS during events that may particularly affect DOI trust resources.

II.C.1. Support actions to reduce or eliminate contaminant impacts of selenium in the Grand Valley (Ongoing)

The Grand Junction EC staff has remained involved with both the Gunnison Basin Selenium Task Force and Grand Valley Selenium Task Force.

II.D. Support actions to reduce or eliminate selenium impacts at Ashley Creek and Stewart Drain (Ongoing)

Contacts:

Barb Osmundson
U.S. Fish and Wildlife Service
Environmental Contaminants Division
Grand Junction Ecological Services Field Office
764 Horizon Dr., Bldg. B
Grand Junction, CO 81506
ph 970-243-2778 ext. 21
fx. 970-245-6933
barb_osmundson@fws.gov

John Isanhart
U.S. Fish and Wildlife Service
Environmental Contaminants Division
Utah Ecological Services Field Office
2369 West Orton Circle, Suite 50
West Valley City, UT 84119
ph. 801.975.3330 ext. 144
fx. 801.975.3331
john_isanhart@fws.gov

Lisa L. Williams
(Acting) Region 6 Environmental Contaminants Coordinator
U.S. Fish and Wildlife Service
134 Union Blvd
Lakewood, CO 80228
ph. 303-236-4518
lisa_williams@fws.gov