

# ABSTRACTS

## BIOLOGICAL SCIENCES - AQUATIC

### WHITES GULCH STREAM STABILIZATION AND FISHERIES ENHANCEMENT PROJECT <sup>AFS</sup>

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In 1995, a portion of an Upper Missouri Westslope cutthroat (UMWCT) stream, currently one of the two remaining in the Big Belts Range east of Canyon Ferry Reservoir, Broadwater County, Montana, was reclaimed. Turn of the century ground sluicing followed by massive gold dredge operations in the mid-1940's had left 3,000 feet of Whites Gulch perched in a ditch between some 100,000 cubic yards of overburden material and the north valley slope. The south side of the valley remained deeply excavated, filling with water and later, with brook trout (*Salvelinus fontinalis*). Thus, the hydrologic and ecological balance at the site remained precariously altered for years. The inevitable consequence was a massive headcut above the dredged valley triggered by springtime rainstorms in 1993. The result was 700 feet of deeply incised channel marked by 20 to 30 foot vertical walls that provided ponded nonnative brook trout direct access into cutthroat habitat immediately upstream. At this scale, reclamation planning and implementation demanded the combined resources of local, state, and federal agencies working in concert with private consultants. Recognizing the unstable conditions and on-going degradation in Whites Gulch and the value of local UMWCT, the only viable option was to restore long-term hydrologic stability by recreating the valley floodplain and channel to historic geomorphic conditions. To protect and preserve the remnant cutthroat (*Oncorhynchus clarki lewisi*) population from invasive brook trout, project planners had to include provisions for a barrier to segregate the two species. Valuable lessons in stream restoration planning and implementation are always in store for all parties involved in reclamation efforts at this level. Whites Gulch was not without its problems. More emphasis on building flexibility into construction scheduling including funding for post-construction design adjustments and maintenance are absolutely necessary to ensure that QC/QA considerations are met. However, determined efforts by all parties to reach well defined goals at Whites Gulch are paying off. Early monitoring indicates this project to be a conservation success for the physical and biological aspects in and above the project area.

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*Title footnote indicates organization, location and date presentation was made:*

<sup>AFS</sup> Montana Chapter of the American Fisheries Society Annual Meeting, Bozeman, MT, Feb. 5-6, 1997

<sup>MAS</sup> Montana Academy of Sciences Annual Meeting, Billings, MT, April 11-12, 1997

<sup>TWS</sup> Montana Chapter of the Wildlife Society Annual Meeting, Missoula, MT, March 5-7, 1997

<sup>SAF</sup> Society of American Foresters Joint Annual Meeting with TWS as above.

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## DISTRIBUTION OF WHIRLING DISEASE IN MONTANA<sup>AFS</sup>

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The detection of whirling disease (WD), a parasitic infection of salmonids, in the Madison River, southwest Montana, in December 1994 and its subsequent link to a 90% decline in the river's wild rainbow trout, prompted a statewide testing program to map the disease's distribution in Montana's streams, rivers, lakes, ponds and reservoirs. More than 400 sites were tested by fall 1996. Whirling disease is more widespread than anticipated; at least 42 waters in the Clark Fork, Flathead and upper Missouri drainages are infested. Testing failed to detect WD-positive waters in the Yellowstone, Kootenai and St. Mary's drainages. Whirling disease is moving downstream from known headwater outbreaks in the Missouri and Clark Fork drainages. However, within the disease's current distribution, are isolated positive sites that are surrounded by "clean" waters. Infected hatchery fish and fish-eating birds have likely contributed to the introduction and spread of WD in Montana. Other transport mechanisms are possible but unlikely.

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## EFFICACY OF SPECIAL REGULATIONS ON THE BIG HOLE RIVER<sup>AFS</sup>

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Three Big Hole River study sections, southwest Montana, were analyzed to determine the efficacy of a special regulation in increasing numbers of larger brown trout (*Salmo trutta*) and rainbow trout (*Oncorhynchus mykiss*) over the 1981 - 1996 period. The regulation requires the release of trout in the 13 - 22 inch range and restricts the method to the use of artificials. Boat-mounted mobile anode electrofishing sampling was conducted annually in March in two study sections to determine brown trout populations. Rainbow trout sampling was conducted in September in three study sections. Population estimates were determined by log - likelihood analysis of mark - recapture data. Brown trout density and standing crop fluctuated in the control section but exhibited increasing trends under special regulation. Thirteen inch and larger and 18 inch and larger brown trout were higher in the special regulation section. Brown trout data suggest that the "slot limit" was effective in increasing the percentage of the standing crop accounted for by both 13 inch and larger and 18 inch and larger fish. Rainbow trout densities and standing crops fluctuated with recruitment in all three sections. Numbers of 13 inch and larger rainbow trout exhibited increasing trends within all three sections. Sixteen inch and larger rainbow trout attained the highest densities and increase in the control section. Data suggest that the "slot limit" was ineffective in increasing the percentage of the standing crop accounted for by the 13 inch and larger or 16 inch and larger rainbow trout.

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**RIPARIAN AND WETLAND ECOLOGICAL HEALTH EVALUATION OF  
SELECTED STREAMS ON THE CHARLES M. RUSSELL NATIONAL WILDLIFE  
REFUGE** <sup>TWS</sup>

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Between August 7 and October 15, 1995, the Riparian and Wetland Research Program of the University of Montana evaluated 113 stream segments on the Charles M. Russell National Wildlife Refuge (CMR NWR) in northcentral Montana. The evaluations provided USDI Fish and Wildlife Service managers on the CMR NWR with information to help them appraise their current management practices, and to help them develop strategies to meet objectives regarding riparian and wetland health on the refuge. Sixteen factors relating to hydrology and streambank, geology and soils, and riparian vegetation were scored for each stream reach. Based on the scores, the reach was classified as functioning, functioning at risk, or nonfunctional. Sixty-nine percent of evaluated stream segments scored in the nonfunctional category. Evidence from livestock exclosures and adjacent ownerships suggests that current livestock grazing practices may be inappropriate for some CMR NWR streams given the fragile soils that occupy much of the land area. Other factors affecting health scores may include water removal (via stock ponds and upstream irrigation withdrawals) and the absence of beaver (*Castor canadensis*).

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**SUSTAINABLE VERSUS UNSUSTAINABLE CONSERVATION EFFORTS  
ALONG THE PERUVIAN COAST** <sup>TWS</sup>

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In December 1996, a study was initiated with the goals of balancing the needs of marine wildlife (fur seals, sea lions, and penguins) with the needs of a local artisanal fishermen at Punta San Juan, Peru (15° 22' S 75° 11' W). Original plans were to collect data on 1) foraging locations of those marine predators are most heavily exploited (directly and indirectly) by the fishery and 2) locations where local fisherman capture their marine resources (i.e. fish, eggs, mollusks). With these data we planned to identify locations of heaviest overlap and interaction, and propose regulations to limit fishing in areas of marginal productivity value for the fisherman, yet high mortality rates for the wildlife, especially in the case of the Humboldt penguin, a species listed under CITES appendix I. Despite our ability to accurately collect data, integrate them into a simple, easily understandable series of overlap charts, and derive legal regulations prohibiting fishing under certain conditions, this approach will be received with scepticism. I will now outline a newer approach to conservation of the Peruvian marine ecosystem, which attempts to better integrate the ideas and life-styles of the local fishing community. I will describe the history of the

conservation of the living resources of the marine upwelling system in Peru, and provide examples of how small attitude changes in the conservationist can produce a large change in the desired results.

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### ASSESSING FUNCTIONAL HEALTH OF A RIPARIAN SITE <sup>TWS</sup>

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An increased public awareness of the benefits of the need for ecosystem functional health has driven a movement to identify factors that operate on the landscape to enhance or degrade natural ecologic function. In cooperation with various agencies, we have developed a rapid assessment procedure for evaluating functional health of a stream reach and its associated riparian zone. The procedure quantifies an array of parameters indicating the ability of different aspects of the system to function. These quantities are weighted and factored into a formula to produce a comparative rating of riparian functional health. A land manager can use the evaluation to: 1) assess present functional health of a stream reach, 2) identify specific factors needing remedial attention, and/or 3) through repeated evaluation as a monitoring tool for assessing effectiveness of management change. The procedure, designed for use by land management professionals as well as landowners with minimal training, can be used to evaluate health of a 200 ft representative reach of stream in about 2 hours. The evaluation does not require precise measurements, but instead relies on visual estimations of readily observable parameters grouped into three categories of factors: vegetation, soils/geology, and hydrology/streambank. Estimates of ten such factors are used to develop an overall health rating. With minimal training, evaluators using this procedure have demonstrated success at calibrating their observational skills to attain consistent and repeatable results.

### BIOLOGICAL SCIENCES - TERRESTRIAL

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#### WHO GETS PARASITIZED BY BROWN-HEADED COWBIRDS? THE IMPORTANCE OF EVERYDAY HOST ACTIVITY <sup>TWS</sup>

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The recent range expansion of the Brown-headed Cowbird (*Moluthrus ater*) in North America has introduced brood parasitism as a new selective force for many host species. High parasitism rates cause greatly reduced reproductive success for many species. Parasitism rates vary dramatically among species, but factors affecting the probability of parasitism remain poorly understood. Cowbirds are thought to find nests by watching adult behavior, and nest defense behavior correlates with parasitism rates among some species. Other more prominent behaviors (e.g. nest-