ABSTRACTS

BIOLOGICAL SCIENCES - AQUATIC

FISHES, TOADS AND NATURAL FLOODPLAINS: SPECIES DISTRIBUTION IN DIVERSE AND THERMALLY COMPLEX AQUATIC HABITATS [MAS-CPR]

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Aquatic habitats of natural floodplains display a diversity of hydrologic and thermal conditions resulting from the exchange and mixing of surface and subsurface waters. Branches of the main river channel, isolated floodplain ponds, and low-gradient spring brooks create a mosaic of thermal habitats different from those of surface-fed tributaries and laterally confined rivers. Instability and switching of the river channel across its floodplain in response to floods, bedload deposits, and large woody debris jams appear crucial to the creation and maintenance of these complex habitats. From summer of 1994 through winter of 1995, we conducted regular habitat and temperature surveys of mainstem side channels, floodplain ponds and spring brooks and observed fish and amphibian distribution in day and night snorkel surveys. Based on patterns in distribution and age structure, aquatic vertebrates living in floodplain habitats can be classified into 'warm' water dependent species such as toad tadpoles and juvenile suckers (14-22° C), cold water dependent salmonids (6-14° C), and transitional species such as whitefish and sculpin (6-18° C). Fishes living in spring brooks were almost exclusively nocturnal in their activity. An introduced species, brook trout (*Salvelinus fontinalis*), dominates spring brook habitats (0.010 adults/m2) and floodplain ponds (0.012 adults/m2), but was less common in main channel habitats (< 0.001 adults/m2). A spring brook sampled on the North Fork Flathead River, where brook trout have not invaded, was occupied by similar densities (0.010 adults/m) of westslope cutthroat trout (*Oncorhynchus clarki lewisi*). These observations suggest that cutthroat trout have been excluded from the Middle Fork springbrook by brook trout, and conflict with experimental and distributional evidence suggesting that cutthroat trout are better competitors at colder water temperatures. Relative thermal and hydrologic stability may render such groundwater influenced waters more invasible by brook trout, compromising floodplain habitats as reproductive or winter refugia for native species such as westslope cutthroat trout and bull trout (*Salvelinus confluentus*). The boreal toad (*Bufo boreas*) was locally abundant and relied heavily on floodplain ponds as breeding sites and nursery areas for tadpoles. Anthropogenic alteration of floodplain rivers, which regulate flow and prevent lateral migration of the river channel, disrupt the natural disturbances responsible for resetting successional sequences, maintaining connectivity and ultimately creating these diverse habitats.

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

[MAS] *Montana Academy of Sciences Annual Meeting, Missoula, MT, April 1996*

[MAS-CPR] *A Symposium on Ecosystem CPR: Conservation, Preservation, and Restoration of Ecosystems held in conjunction with the Montana Academy of Sciences Annual Meeting, Missoula, MT, April, 1996*

[TWS] *Montana Chapter of the Wildlife Society Annual Meeting, Chico Hot Springs, MT, March 1996*

[WTWS] *Ecosystem Management for Wildlife Conservation in the Pacific Northwest - A Workshop sponsored by the Washington Chapter of The Wildlife Society in cooperation with the Mountaineers Foundation and the Weyerhauser Corporation, Olympia, WA, October, 1996*

Reconnecting Attributes of River Ecosystems: A Dynamic Catchment Approach to River Conservation-Preservation-Restoration MAS-CPR

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Large catchment basins may be viewed as ecosystems in which natural and cultural attributes interact around centers of organization within the geohydraulic continuum of the river corridor. Rivers are four dimensional environments, involving processes that connect upstream-downstream, channel-groundwater and channel-floodplain zones, and all these vary temporally. Natural and human disturbances sever these interactive pathways, resulting in lost ecosystem capacity to sustain native biodiversity and productivity. Contemporary river ecology theory can address remediation of the combined effects of human disturbances, such as stream regulation, pollution and food web manipulation. A river's physical continuum and its biodiversity and productivity are controlled by abiotic factors that derive from cut and fill alluviation mediated by catchment water yield. Re-regulation of flow in a whole catchment context, coupled with elimination of pollutants and constrainment of nonnative biota, can bring natural restoration to damaged habitats from headwaters to mouth. Protocols for restoration of river ecosystems damaged by flow regulation are: restoration of peak flows (reconnect and reconfigure thalweg and floodplain habitats); stabilization of base flows to revitalize the varial zone; maximization of dam passage to restore metapopulation structure; reliance on natural habitat restoration as opposed to artificial propagation of fisheries, artificial instream structures and food web control, and adaptive management. Although restoration to aboriginal state is not expected, rapid and substantial recovery of native biodiversity and productivity is possible, especially in rivers with a substantial part of the continuum still free flowing. The cost may be less than expected because the river does much of the work.

Biological Sciences - Terrestrial

Disease Surveillance of Coyotes in Relation to Black-Footed Ferret Reintroduction, 1995 TWS

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Disease is an important component in black-footed ferret (*Mustela nigripes*) reintroduction efforts. Canine distemper and sylvatic plague are two of the primary diseases of concern. The 1992 Black-footed Ferret Disease Ecology Workshop recommended that a disease survey be done before