

INTRODUCTION

Ouray NWR contains 11,987 acres of riparian woodlands, floodplain wetlands, upland grasslands, and shrublands bordering 16 miles of the Green River in northeastern Utah (Fig. 1). The refuge was established in 1960 with an original purpose to provide breeding, resting, and feeding areas for migratory waterfowl in the Green River corridor. Most (5,032 acres) land in the refuge is owned in fee title by the U.S. Fish and Wildlife Service (USFWS) and was purchased using Duck Stamp funds. Other lands in the refuge include 3,110 acres transferred to the USFWS by the Bureau of Land Management (BLM), 2,692 acres leased from the Ute tribe, and 1,153 acres leased from the state of Utah (Fig. 2). The majority of the refuge consists of a series of floodplain bottoms that adjoin the Green River behind channel bends (Fig. 3).

Located in the Uinta Basin of Utah, the Green River and its floodplain at Ouray is a relatively wide, low gradient, sand bed system that has cut meandering channels through the soft Uinta geological formation. A complex of alluvial-derived geomorphic surfaces are present in this stretch of the Green River and includes point bars, natural levees, floodplain terraces, backswamps, older abandoned channels, and the active channel of the river. Historic alluvial processes created a heterogenous distribution of topography, soils, and hydrological regimes on Ouray NWR that support a diversity of habitats. Riparian and floodplain wetland habitats such as those found at Ouray NWR are relatively rare and decreasing throughout the Inter-

mountain West. These remnant habitats are critical to supporting a rich diversity of endemic plant and animal species (e.g., Knopf et al. 1988).

Many alterations to the physical structure and ecological processes of the Green River ecosystem have occurred since Ouray NWR was established. Most significantly, the hydrology of the Green River was greatly altered after Flaming Gorge Reservoir was built upstream on the Green River. Flood frequency, duration, peak and base flows, sediment loading, and channel dynamics of the Green River were changed after Flaming Gorge Dam was closed in 1962 and these changes have affected vegetation distribution, nutrient flow, and animal populations on Ouray NWR. Other major changes to the refuge since its establishment include extensive construction of levees, ditches, and water control

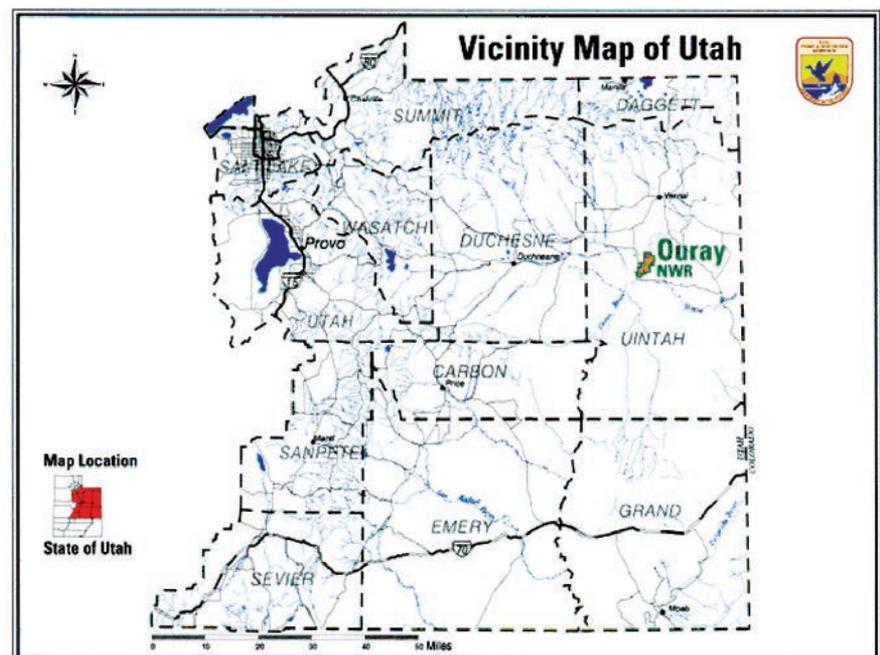


Figure 1. Location of Ouray National Wildlife Refuge, Utah.

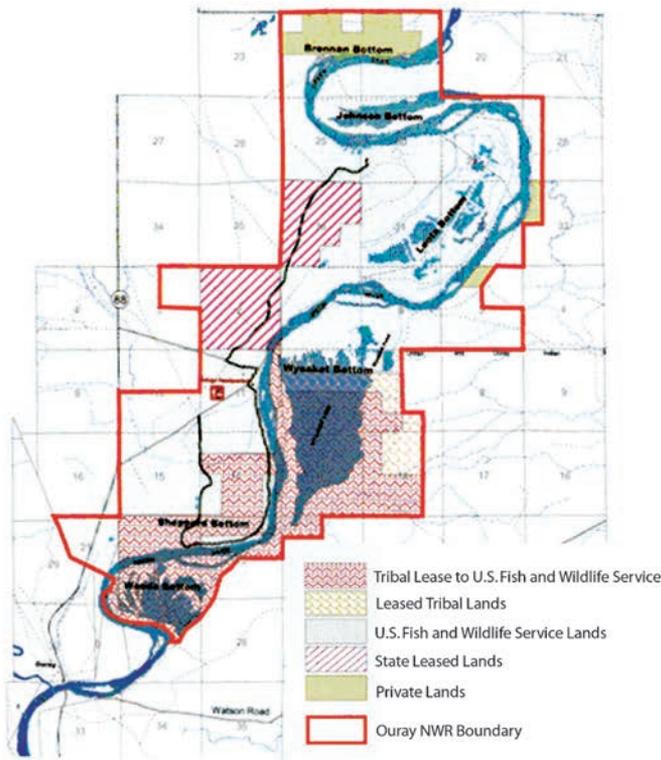


Figure 2. Ownership of lands within Ouray National Wildlife Refuge, Utah.

structures; invasion of exotic plants and animals; contamination from selenium in irrigation water draining onto the refuge; and declining populations of many rare, threatened, and endangered animal species.

A primary challenge for future management of Ouray NWR is understanding how the Green River floodplain ecosystem can sustain historic ecological functions and values given its highly modified landscape and hydrologic regime. Integrating habitat restoration projects on Ouray NWR in the mix of sometimes competing objectives requires that restoration projects be “system-based”, and strategically located, to emulate natural distribution of habitats in relation to geomorphic setting, topography, and hydrologic condition (e.g., Heitmeyer et al. 2002). Options for restoration projects on Ouray NWR must be carefully evaluated to identify the most economically and ecologically feasible opportunities that can reduce certain problems (e.g., invasive species) while simultaneously restoring at least some elements of ecosystem integrity and sustainability (e.g., overbank flooding into floodplain bottoms) within constraints of past degradations.

This report provides an analyses of options for restoring and managing native ecosystems and habitats at Ouray NWR. Objectives were to:

1. Synthesize information on the geologic formations, geomorphic features, hydrologic condition, and natural history of the Green River ecosystem in the vicinity of Ouray NWR.
2. Identify how the structure and function of the Green River ecosystem at Ouray NWR have been altered.
3. Identify restoration approaches and ecological attributes needed to restore and manage specific habitats and ecological conditions on Ouray NWR.

For purposes of this report, we use the period prior to construction and closure of Flaming Gorge Reservoir in the mid-1900s as the benchmark to determine what ecosystem elements should be restored to if possible. We use this benchmark time because in the mid-1900s the Green River was relatively unaltered by upstream reservoirs and water use, exotic plants and animals were not abundant in Green River floodplains, and agricultural production on Ouray NWR was limited.

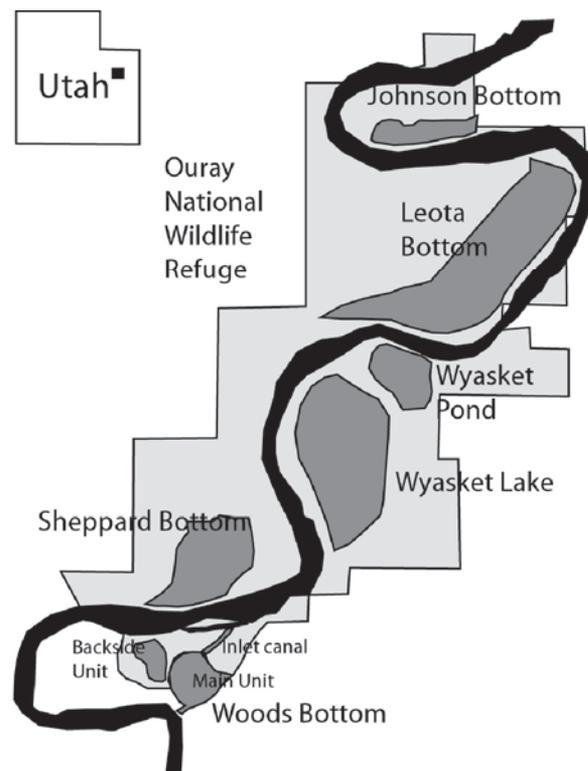


Figure 3. Floodplain “bottoms” on Ouray National Wildlife Refuge, Utah.

