

Misunderstood Landscapes: Wetlands and People

Up until the 1970s, wetlands were considered useless, unhealthy wastelands. Laws and policies encouraged their draining and dredging. Farmers were paid to turn wetlands into croplands, and sprawling cities dredged and filled wetlands to accommodate new roads, factories, and housing developments. It's estimated that by the mid-1980s, more than half of the original wetlands in the lower 48 states had been lost due to human activities (Dahl 1990).

Fortunately, due to Yellowstone's designation as a national park, Yellowstone's wetlands have been spared many impacts. Less than 2 percent of park land has been developed, yet those roads and developments that do exist were historically placed in or near the more easily traveled and most scenic places—wetlands. Riparian corridors were always the easiest travel routes for early explorers and mappers. Today, when possible, the park is moving such developments out of wetlands and attempting to restore them to more natural conditions. Wetland areas that have the potential to be affected by new projects are now mapped and inventoried so that the projects can be designed to avoid or minimize adverse impacts.

Developments are not the only influence on Yellowstone's wetland resources. Exotic organisms, such as New Zealand mud snails and whirling disease, are recent accidental introductions, probably brought in on fishermen's footwear and equipment. These exotic species have the potential to change the composition of the community—the existing array of native aquatic insects and mollusks—and quite possibly cause declines in fish populations. The degree to which these uninvited



Warm spring spikerush growing over the road in Gibbon Canyon.

arrivals will affect the park's aquatic systems is currently unknown.

Undoubtedly an intentional illegal introduction, non-native lake trout were discovered in Yellowstone Lake in 1994. A much larger and voracious fish than the cutthroat trout, lake trout pose a great threat to the future of the lake's native fish, and the effects ripple. Scientists estimate that the fates of at least 42 species of birds and mammals are to some extent tied to the Yellowstone cutthroat (Varley and Schullery 1995). These



Photographing elephant's head.

J. Whipple

include the osprey, bald eagle, black bear, grizzly bear, river otter, mink, marten, short- and longtail weasel, pelican, merganser, California gull, loon, kingfisher, and dozens more. Some of these species eat fish only occasionally, while others—both scavengers and predators—depend on them heavily. Unless lake trout numbers are controlled, they will severely reduce cutthroat trout numbers, affecting the entire food chain.

While wetlands have been bad-mouthed in the past (think of such expressions as *bogged* down in details or *swamped* with work), scientists and the American public are beginning to appreciate how wetlands help to maintain a healthy environment. Scientists now know that wetlands are vital natural filters of contaminants, pollutants, and other toxic materials. Wetland soils and vegetation impede the incoming flow of water, act as natural carbon filters, and send on the outgoing water in a much cleaner condition. Wetlands also trap metals from natural sources. In Yellowstone's wetland sediments, researchers have found high levels of metals, such as arsenic, uranium, mercury, zinc, and other toxic and nutrient trace metals, that are natural components of hydrothermal waters (Otton 1997). Without the natural filtering wetlands provide, rivers such as the Firehole and Gibbon, which receive large infusions of runoff from hot springs and geysers, would probably be chemically unsuited to support the high productivity of life found there today.

Wetlands have also been called a window on the Earth's past. Wetlands evolve through time,

and scientists learn how they have changed by looking at wetland soil cores and studying the sediments, pollen, diatoms, and other elements found in them. Such evidence provides information about past climates and environments. For example, researchers working to reconstruct the park's past fire frequency and its vegetational history use wetland core pollen records that span the last 14,000 years. Scientists can also obtain information necessary for predicting future climate change by studying the carbon cycle in wetlands, which store carbon as peat and release it as carbon dioxide and methane.

Today, wetlands are also recognized for the numerous and incredible recreational opportunities they provide. Visitors to Yellowstone enjoy sightseeing, bird and wildlife watching, fishing, canoeing, and motor boating. Without wetlands, Yellowstone's landscape simply would not be the park Americans know and cherish.



West Thumb Geyser Basin.

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