RESPONSE OF VEGETATION AND WATERBIRDS TO GEOMORPHOLOGY, WETLAND CHARACTERISTICS, AND WATER-LEVEL MANIPULATION IN THE TARGHEE NATIONAL FOREST, IDAHO AND WYOMING

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We completed the first season of field data collection during May-August 2002. Information collected on hydroperiod characteristics, waterbird abundance, vegetation sampling, soil sampling, and historical wetland condition is summarized below. The results presented below are preliminary. Data entry and analysis will be continued and error checked throughout the winter. We are planning to begin field work in April of 2003 to gather more information on conditions during early plant development. Waterbird scan samples will be continued throughout the fall to obtain information on distribution and habitat use during fall staging and migration periods in addition to information collected during 2002.

Wetland Types and Hydroperiod Characteristics

We assessed the response of waterbirds and vegetation to physical conditions and water level manipulation on 3 different wetland types in the Targhee National Forest during summer 2002. We monitored depth, duration, and extent of flooding (annual hydroperiod characteristics) at each wetland by taking water gauge measurements and mapping the extent of flooded areas on a weekly basis from mid-May to late August. Personnel of the U. S. Forest Service continued monitoring water levels until freeze-up in late October.

Swan Lake and Ernest Lake are semi-permanently flooded wetlands that periodically experience fall and overwinter drawdowns. Chain Lakes and Indian Lake are permanently flooded wetlands with relatively stable water conditions due to man-made levees and beaver dams. We lowered water levels at Mesa Marsh and Beaver Pond using a water control structure and removing a beaver dam. The hydroperiod during 2002 for Beaver Pond and Mesa Marsh was similar to that of semi-permanently flooded wetland (Fig. 1).

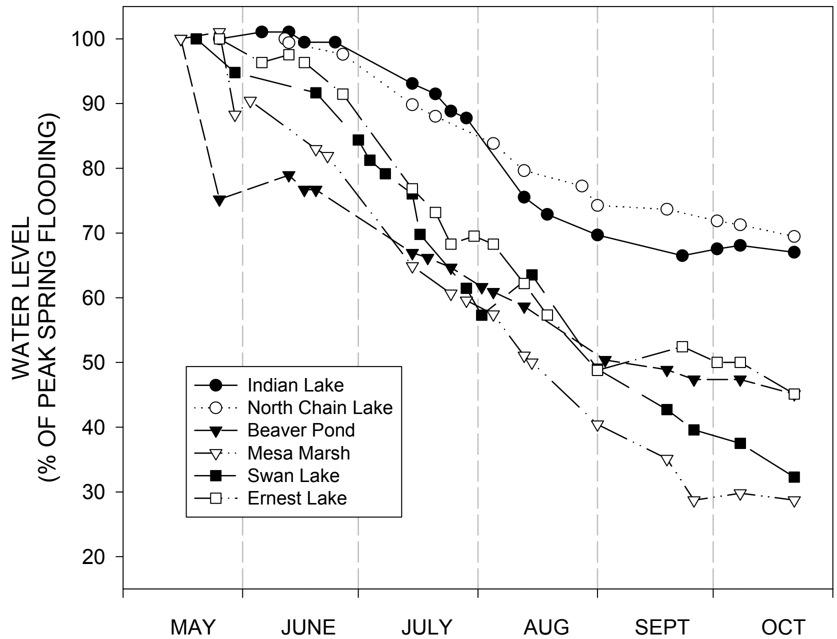

Figure 1. Hydroperiod of six wetlands during May – October 2002 on the Targhee National Forest, Idaho and Wyoming.

Waterbirds

We collected data on waterbird abundance, diurnal habitat use, and behavior according to species, sex, and age (adult or juvenile) on the 6 wetlands listed above plus Bergman Reservoir. Surveys were conducted twice a week during the nesting (late May to late June; 4 weeks) and brood-rearing (mid-July to late August; 6 weeks) periods. We surveyed each wetland twice a week using scan sampling methods during the morning (0730-1200) and afternoon (1300-1730). We mapped locations of all waterbirds observed on photocopies of aerial photos.

We identified 34 different species of waterbirds and counted 4,877 observations of adult birds. The most abundant species were American coot (*Fulica americana*; n = 1160), Canada goose (*Branta canadensis*; n = 595), bufflehead (*Bucephala albeola*; n = 546), mallard (*Anas platyrhynchos*; n = 459), ring-necked duck (*Aythya collaris*; n = 440), lesser scaup (*Aythya affinis*; n = 252), and American widgeon (*Anas americana*; n = 196). All species observed are listed according to guild in Table 1. Detailed analysis of waterbird distributions and habitat use will be completed over the winter. We will compile bird locations digitally using ArcView to examine waterbird distributions at different spatial scales.

Vegetation Sampling

We collected information on species composition, percent cover, height, and morphology of vegetation from 125 1 m^2 plots. We completed vegetation sampling in early June, late June, and late July to obtain information on chronology of growth and abiotic conditions (water depth, soil and water temperatures, and water chemistry). Sampling focused on habitats dominated by water-lily (*Nuphar polysepalum*) and submergent vegetation. Species of submergent vegetation commonly observed included water milfoil (*Myriophyllum spicatum*), coontail (*Ceratophyllum demersum*), pondweeds, (*Potamogeton natans*, *P. epihydrus*, *P. pusillus*, and others) bladderworts (*Utricularia vulgaris* and *U. minor*), water crowfoot (*Ranunculus aquatilis*), water starwort (*Callitriche verna*). We collected samples of water-lily (n = 24) and submergent vegetation (n = 28) for above-ground biomass measurements from Swan Lake, Mesa Marsh, Beaver Pond, and Indian Lake during the peak growing season in early July. Vegetation species not identifiable in the field were collected during different growth stages and pressed for later identification.

Vegetation communities were mapped using a hand-held GPS unit. Areas with newly germinated species of emergent vegetation and willows were also mapped. Map layers of vegetation communities and extent of flooding, combined with field measurements of abiotic conditions (i.e., soil and water temperature) will be used to identify conditions present in different habitat types and during germination of emergent vegetation.

Soil Sampling

We collected soil samples from 125 plots on all 6 wetlands using a 12 in soil corer. Samples were divided based on soil strata; 0-4 in below the soil surface and 4-12 in below the soil surface, because we were unable to obtain a full 12 in core in some plots. Soil samples were air-dried for 1-2 weeks or until dry. After laboratory preparation, soil samples will be analyzed for texture, cation exchange capacity, organic matter, and nutrients.

Trumpeter Swan Disturbance Monitoring

Because trumpeter swans are sensitive to human disturbance during egg-laying and nesting periods, we recorded the response of incubating trumpeter swans to research activities. We recorded activity and location of nesting swans when we arrived at a wetland and at all sampling locations. We recorded the time, activity of the swan, distance from observer to swan nest, distance from swan to the nest if one or both swans left the nest site, how long the swan was away from the nest, and the reason for the swan leaving the nest site (observer; to forage, covers eggs; defense of territory or nest; rest or preen, remains nearby nest; and other). We also recorded observer activity (scan sampling, vegetation sampling, and setting up plots) and total time spent at a wetland.

Trumpeter swans were observed at all 6 wetlands during May and June, and nested at 3 of the 6 wetlands, Swan Lake, Mesa Marsh, and Indian Lake. Each nest successfully hatched 2 or 3 cygnets. Based on examination of nest contents after cygnets hatched, it appeared that clutch size was 2 at Swan Lake and 3 at Mesa Marsh and Indian Lake. The cygnets at Mesa Marsh were lost relatively early (prior to late July), those at Swan Lake moved to the Henry's Fork River with the adults in mid-August, and 3 cygnets were still with the adults at Indian in early September.

Historical Wetland Condition

Aerial photographs of each wetland from 1950 to 1995 were scanned into digital format. Photographs will be georectified and vegetation communities will be identified and digitized by hand. We will generate patch-level and wetland-scale metrics for each wetland and time period including number of vegetation communities, number of patches, average patch size, and perimeter-to-area rations. We will compare community composition, spatial heterogeneity, and diversity of habitat types within each wetland between time periods. We will examine historical changes in wetland condition in relationship to hydrological alterations (dams and levees) and climatic conditions (e.g., Palmer Drought Index).

Table 1. Species and total abundance of birds observed during morning and afternoon scan surveys (n = 8 scan surveys per wetland) on the Targhee National Forest, Idaho and Wyoming during late May to late June 2002.

Species	Total Abundance
DABBLING DUCKS	
Mallard (*Anas platyrhynchos*)	459
American widgeon (*Anas americana*)	196
Gadwall (*Anas strepera*)	118
Cinnamon teal (*Anas cyanoptera*)	113
Green-wing teal (*Anas crecca*)	96
Blue-wing teal (*Anas discors*)	73
Woodduck (*Aix sponsa*)	16
Northern shoveler (*Anas clypeata*)	12
Northern pintail (*Anas acuta*)	12
DIVING DUCKS	
Bufflehead (*Bucephala albeola*)	546
Ring-necked duck (*Aythya collaris*)	440
Lesser scaup (*Aythya affinis*)	252
Ruddy duck (*Oxyura jamaicensis*)	71
Barrow’s goldeneye (*Bucephala islandica*)	27
Canvasback (*Aythya vallisineria*)	7
Common goldeneye (*Bucephala clangula*)	2
Redhead (*Aythya americana*)	2
SWANS AND GEESE	
Canada Goose (*Branta canadensis*)	595
Trumpeter Swan (*Cygnus buccinator*)	86
COOTS AND RAILS	
American Coot (*Fulica americana*)	1160
Sora (*Porzana carolina*)	14
GREBES	
Eared grebe (*Podiceps nigricollis*)	31
Pied-billed grebe (*Podilumbus podiceps*)	21
Western grebe (*Aechmophorus occidentalis*)	10
SHOREBIRDS	
Killdeer (*Charadrius vociferous*)	117
Spotted sandpiper (*Actitis macuaria*)	89
Wilson’s phalarope (*Phalaropus tricolor*)	10
American avocet (*Recurvirosta americana*)	6
Common snipe (*Gallinago gallinago*)	3
CRANES AND WADING BIRDS	
Sandhill Crane (*Grus canadensis*)	110
Great blue heron (*Ardea herodias*)	5
LOONS	
Common Loon (*Gavia immer*)	14
CORMORANTS	
Double-crested cormorant (*Phalacrocorax auritus*)	1
OSPREY	
Osprey (*Pandion haliaetus*)	1