DISTRIBUTION OF LITTORAL MACROPHYTES IN JACKSON LAKE, WYOMING

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Objectives

The research described here is part of a 2-year study to characterize the structure and function of the littoral macrophyte community in Jackson Lake, Grand Teton National Park. The objectives for the 1st year were: 1) to identify the plant species occuring in the lake; 2) to quantify their relative abundances; 3) to characterize the littoral habitat, and; 4) to construct a detailed map of macrophyte distribution. Data collected during the first field season will be used to help evaluate results of experiments conducted during year two on mechanisms affecting macrophyte segregation.

Field Activities and Results

During June 1983, a preliminary survey was conducted on Jackson Lake to characterize the littoral habitat. This zone was characterized into habitat types by: 1) randomly establishing transects perpendicular to the shore and then estimating the linear distance between the shore and a point where the depth was 12 m by depth sounding; 2) reviewing U.S. Geological Survey maps, and; 3) evaluating air photographs.

The habitat categories, amount of lake shore in each category and number of transects sampled for plants in each category are summarized in Table 1.

During July and August, plant distribution and abundance were measured. Simultaneously, plants were collected for preparation of a species voucher collection. The taxa identified to date are listed in Table 2. Plants were collected by diving, dredging, and raking the lake bottom (in shallow water).

Species distribution and abundance were measured using the following field technique. It was developed during June especially for underwater sampling by SCUBA diving. Forty transect locations were assigned to points along the shore. A line marked in meters was then extended perpendicularly into the water and along the bottom until a depth of 11 m was reached. This transect was divided into six depth classes (0.0 - 1.5 m, 1.5 - 3.0 m, 3.0 - 4.5 m, 4.5 - 6.0 m, 6.0 - 7.5 m, and 7.5 - 10.0 m). Twenty quadrats (0.5 m x 0.25m) were measured in each depth class. The number of quadrats sampled in each depth class depended on the relative horizontal distance covered by the transect line at each depth.

Table 1. Data on habitat categories assigned to the littoral zone in Jackson Lake. Sheltered - protected from direct wave action; intermediate - wind waves reduced by short fetches, islands, etc.; exposed - heaviest wave action. Shallow - < 4 m deep at 100 m from shore; not steep - < 12 m at 100 m from shore; steep - > 12 m at 50 m from shore. Marina shores not sampled for safety reasons (the heavy motor boat traffic).

Habitat category	linear km of shoreline	% total shoreline	# transects measured to date
Sheltered			
shallow	3.35	3.23	1
not steep	6.83	6.58	4
steep	0.64	0.62	1
Intermediate			
shallow	22.50	21.68	3
not steep	25.31	24.44	10
steep	7.60	7.32	8
Exposed			
shallow	5.86	5.65	5 (raking)
not steep	18.94	18.25	10
steep	12.75	12.29	3
Totals			
sheltered	10.85	10.43	6
intermediate	55.41	53.39	21
exposed	37.55	36.18	18
shallow	31.71	30.55	9
not steep	51.08	49.22	24
steep	21.00	20.23	12

Table 2. Taxa of submersed macrophutes forun in Jackson Lake. The list does not include all taxa because some plants have not yet been identified.

TAXA IDENTIFIED
Alismaceae family
Sparganiaceae family
Nuphar spp.
Chara spp.
Elodea canadensis
Myriophyllum spicatum
Hippurus vulgaris
Persicaria amphibia
Ranunculus tricophyllus
Ultricularia vulgaris
Potamogeton alpinus
Potamogeton richardsonii
Potamogeton filigormis
Potamogeton pectinatus
Potamogeton sp. 1
Potamogeton sp. 2
Ceratophyllum demarsum

Currently, the analyses of the distribution data are in progress. Species distribution will be plotted on computer - generated maps when the analyses and the species identifications are completed. The seasonal extent of the littoral zone will be corrected using lake elevation values provided by the Bureau of Reclamation, Jackson Lake Dam for the period from June thru August, 1983.

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