

DISCUSSION PAPER

WETLANDS AND DEEPWATER HABITATS
in the
STATE OF WASHINGTON

by

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INTRODUCTION

In 1988 the U.S. Fish and Wildlife Service (Service), through the National Wetlands Inventory (Inventory) completed wetland and deepwater habitat mapping for the State of Washington. A series of wetland maps were produced at a scale of 1:24,000 (U. S. Geological Survey 7.5 minute topographic map) using the Service's "Classification of Wetlands and Deepwater Habitats of the United States".

Upon completion of wetland mapping the Service and Washington Department of Ecology entered into an agreement for the Service to prepare acreage data for wetlands and deepwater habitats in the State. These data would be taken from Inventory wetland maps, entered into a geographic information system (GIS), and acreage summaries prepared. Because wetland maps for Washington were produced using aerial photography ranging from 1980 to 1984, the data for current acreage reflect early-1980's wetlands and deepwater habitat conditions.

The purpose of this discussion paper is to present a summary of current wetland and deepwater habitat acreage within the State of Washington and to compare these data to available historic acreage.

METHODS

Definitions

For this discussion paper wetlands and deepwater habitats are defined according to the U. S. Fish and Wildlife Service as follows:

Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification wetlands must have one or more of the following three attributes: 1) at least periodically, the lands supports predominantly hydrophytes; 2) the substrate is predominantly undrained hydric soil; and 3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year.

Deepwater habitats are permanently flooded lands lying below the deepwater boundary of wetlands. Deepwater habitats include environments where surface water is permanent and often deep, so that water, rather than air, is the principal medium within which the dominant organisms live, whether or not they are attached to the substrate.

The Service's wetland and deepwater habitat definitions and classification system are further detailed in Cowardin et al., 1979.

Current wetlands and deepwater habitats acreage data were derived from 1,481 Inventory wetland maps (1:24,000 scale) prepared using color infrared aerial photographs (1:58,000 and 1:65,000 scales) taken between 1980 to 1984. Inventory photointerpretation procedures, combined with field review of a sample of wetland sites, were used to complete the wetland mapping. Due to limitations of mapping primarily through the use of aerial photography, a small percentage of wetlands may not have been identified and, therefore, not included in the current acreage data.

Current acreage of the more than 1,100 various wetland and deepwater habitat types were combined into eight major categories: estuarine deepwater habitats, estuarine wetlands, lacustrine deepwater habitats, marine deepwater habitats, marine wetlands, palustrine wetlands, riverine deepwater habitats, and riverine wetlands. Although not in strict conformance with the Service's wetland classification system, all lacustrine and riverine types were considered as deepwater habitats for this discussion paper.

Inventory maps that included any portion of Washington were digitized in their entirety. Thus the acreage summaries in the Appendix include portions of Oregon for those maps along the Washington/Oregon border. Therefore, the acreage in the FINDINGS Section were adjusted to exclude an estimated 50,000 acres of wetlands and 118,000 acres of deepwater habitats occurring in Oregon.

For comparison with historical data, marine deepwater habitats were excluded. The remaining seven categories were further combined into only two categories - wetlands and deepwater habitats - and rounded to the nearest 1,000 acres.

Determination of historical wetland and deepwater habitat acreage within Washington was based on a limited literature review and personal communications with individuals who have done research or were otherwise knowledgeable of Washington's wetland and deepwater habitat resources. In addition hydric soils data provided by the U. S. Soil Conservation Service were used. As with current acreage, marine deepwater habitats were not included in the historical estimates. For each of the general geographical areas discussed in the FINDINGS section historical acreage of wetlands and deepwater habitats are summarized to the nearest 10,000 acres.

FINDINGS

Current Wetlands and Deepwater Habitats

Current acreage of wetlands and deepwater habitats in the State of Washington are summarized in table 1. Wetlands total 938,000 acres and deepwater habitats 1,441,000 acres. Combined all wetlands and deepwater habitats comprise about 5% of the land surface of the State; wetlands account for 2% and deepwater habitats make up 3%.

Historical Wetlands and Deepwater Habitats

Bortleson's et al. (1980) discussion of historical changes in Puget Sound was the primary data source for the Puget Sound area. While their survey covered the major estuaries it included only 11 of 50 estuaries in Puget Sound and presented no historical acreage data for intertidal wetlands in the Samish, Skagit, and Stillquamish estuaries. For the areas surveyed Bortleson et al. estimated 69,000 acres of wetlands existed historically. Since no additional presettlement wetland acreage data was found, their estimate of 22,000 acres of existing intertidal wetlands for Samish, Skagit, and Stillquamish was used as a presettlement estimate. To account for the 39 unsurveyed estuaries a factor of 20% was applied to the 69,000 historic acreage figure. Thus (to the nearest 10,000 acres) an estimated 110,000 acres of wetlands were historically found in the Puget Sound area.

For Grays Harbor, Willapa Bay, and the Washington outer coast (marine and estuarine) wetlands, a combination of reports and current acreage summaries were used. Assuming limited development along the outer Washington coast and few marine wetland losses in this area, the current 27,000 acres of marine intertidal wetlands is considered a reasonable estimate of historic acreage. Simenstad et al. (1982) list historic acreage of wetlands in Grays Harbor at 48,000 acres. The Service (1979) notes tidal marshes of Willapa Bay originally totaled 12,000 acres; in the absence of historical information for the intertidal mud flats (unvegetated wetlands) in Willapa Bay, the current acreage of about 45,000 acres was used as an estimate of the historical acreage for this type of wetland. Thus about 130,000 acres of wetlands occurred in the above areas at presettlement.

Thomas (1983) divides the Columbia River estuary into seven subareas and presents historical wetland data for each of the subareas in their entirety without regard to the Washington-Oregon boundary. The following estimates for percent of the subareas occurring in Washington were used to determine historical acreage: Baker Bay - 100%; Grays Bay - 100%; Mixing Zone - 25%; and Upper Estuary - 75%. The very small portions of Washington in the River Mouth and Cathlamet Bay subareas are offset by including all of Baker Bay and Grays Bay subareas. For

the Washington portion of the Columbia River estuary an estimated 30,000 acres of wetlands were present at presettlement.

The prevalence of wetland vegetation and the presence of wet soils reflect long term hydrology and are useful indicators of current and/or historical wetlands. With the lack of extensive wetland vegetation surveys for the interior areas of Washington, soil data were used to estimate historical wetland acreage. About 70% of the State (about 30.5 million acres) is covered by published U. S. Soil Conservation Service soil surveys. Approximately 2.4% of the area surveyed (743,500 acres) are identified as hydric soils. These hydric soils are indicative of wetlands. The areas not covered by soils data are generally higher elevation areas with steeper slopes where fewer wetlands would be expected to occur. Thus it was assumed that a lesser percentage (1.2%) of these non-surveyed areas could have hydric soils for an additional estimate of 157,000 acres of wetlands. Therefore based on identified hydric soils an estimated 900,000 acres of interior wetlands were in Washington, historically.

The Service has identified numerous soils believed to have hydric soils characteristics and therefore indicative of wetlands. These possible hydric soils were not included on the hydric soils list because data on which to base a definitive determination was limited or imprecise. Several of these possible hydric soils are currently being reviewed and evaluated by the National Technical Committee for Hydric Soils for inclusion on the hydric soils list. These possible hydric soils total about 298,000 acres or 1% of the areas surveyed in Washington. With an assumption that 0.5% of the non-surveyed areas could have possible hydric soils there would be an additional 64,000 acres for a total estimate of 360,000 acres of what may have been wetlands.

Total historical wetland acreage in Washington is estimated to have ranged from 1.17 to 1.53 million acres by considering only the identified and accepted hydric soils or by also including the possible hydric soils, respectively.

Assuming little overall change for estuarine open water areas (deepwater habitats) within Washington, the current figure of about 635,000 acres from the Inventory's wetland maps was used as the historic acreage estimate. In 1950 the total area of permanent inland deepwater habitats in the State was determined to be 900,000 acres (U. S. Department of the Interior, 1955). Excluding 53,000 acres of these habitats that were manmade reservoirs built after presettlement, the estimate of historical inland deepwater habitats is 847,000 acres. Thus deepwater habitats in Washington, excluding any marine open water areas, at presettlement is estimated at 1.48 million acres.

SUMMARY

Total acreage for wetlands that historically occurred in Washington is estimated to be about 1.35 million acres (table 2). Current wetlands in Washington total 938,000 acres - a loss of 412,000 acres or 31% reduction from presettlement wetland acreage.

Deepwater habitats remained, for all practical purposes, stable between presettlement and present day - decreasing by 3% from 1.48 to 1.44 million acres.

It is difficult to compare current Inventory data with historical data. The knowledge of wetlands has increased, classification schemes have changed, and inventory techniques have greatly improved; often "apples to oranges" may be the comparison. The Service has attempted to minimize that problem in this discussion paper by limiting the extensive Inventory map data and the presettlement data reviewed to only wetlands and deepwater habitats for the entire State. Historical data that was reviewed are not refined enough to make comparisons by specific habitat types nor geographical areas within Washington.

The Service encourages additional work to address historic wetland losses, to pursue building on the current wetland and deepwater habitat acreage data, to incorporate the current Inventory digital data into the State's GIS, and to monitor wetland and deepwater habitat changes on a regular five or 10 year basis.

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Table 1.

WASHINGTON ACREAGE SUMMARY: WASH: NWI: WETLANDS
(ATTRIBUTES LUMPED USING WASHSTATE.RULE)

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ATTRIBJTE	POLYGONS			LINEARS			POINTS
	Frequency	Acres	%	Frequency	Miles	%	Frequency
ESTUAR_DEEP_HABS	370	746523.937	1.56	405	99.311	.16	0
ESTUAR_WETLANDS	3346	221899.312	.46	619	238.748	.38	1
LACUST_DEEP_HABS	3569	645622.000	1.35	223	40.714	.07	1
MARINE_DEEP_HABS	101	1187960.000	2.48	4	1.395	.00	0
MARINE_WETLANDS	879	26649.113	.06	648	378.643	.61	3
OUT	58	1417674.000	2.96	0	.000	.00	0
PALUST_WETLANDS	170011	737403.437	1.54	47544	17409.086	27.83	2781
RIVER_DEEP_HABS	10887	160730.062	.34	67068	28201.180	45.08	3
RIVER_WETLANDS	58	711.260	.00	26228	16192.555	25.88	0
UPLAND	19798	42828416.000	89.28	6	.626	.00	7
TOTALS	209077	47973568.000	100.00	142745	62562.254	100.00	2796

DEEPWATER HABITATS ACREAGES

746,500
 645,600
 160,700
 700
5,400 (riverine linears converted to acres)
 1,558,900
 - 118,000 (estimated acres in Oregon along border)
 1,440,900 Total

WETLAND ACREAGES

221,900
 26,600
 737,400
2,100 (palustrine linear wetlands)
 988,000
 - 50,000 (estimated acres in Oregon along border)
 938,000 Total

Table 2. Current acreage of wetlands and deepwater habitats compared with historical acreage of wetlands and deepwater habitats in the State of Washington.

	Acres			
	Current ¹⁾	Historical ²⁾	Change	% Change
Wetlands	938,000	1.35 million ³⁾	-412,000	-31%
Deepwater ⁴⁾ Habitats	1.441 million	1.48 million	-39,000	-3%
Total	2.378 million	2.85 million ⁵⁾	-472,000	-17%

1) nearest 1,000 acres

2) nearest 10,000 acres

3) estimated between 1.17 to 1.53 million acres

4) excludes any marine deepwater habitats

5) estimated between 2.67 to 3.03 million acres