Introduced by John O'Brien

73-547

ORDINANCE NO. 1838

AN ORDINANCE relating to wetlands establishing County Open Space Policies; amending Chapter E, Open Space Development Policies of the Comprehensive Plan for King County under the provisions of Ordinance 263, Article 2, Section 3 of KCC 20.12.030.

PREAMBLE. The Council of King County declares it to be in the public interest to retain certain wetlands within a system of open space. This open space serves as a natural reservoir controlling excess runoff as well as providing unique biotic preserves. They function as scientific laboratories and may contribute to recreation and scenic value.

The policies in the accompanying report will serve as one basis for evaluating the preservation, removal and/or incorporation of wetlands into development plans. The evaluation shall be made in conjunction with other adopted and appropriate Comprehensive Plan Policies.

BE IT ORDAINED BY THE COUNCIL OF KING COUNTY:

SECTION 1. NEW SECTION. "Wetlands as Open Space" attached hereto is hereby adopted as an addendum to the Comprehensive Plan for King County under the provisions of Ordinance 263, Article 2, Section 3, KCC 20.12.030. As an amplification and augmentation of the

Comprehensive Plan, the Wetlands as Open Space Element shall supplemer Chapter E, Open Space Development Policies.

INTRODUCED AND READ for the first time this 13th day of August, 1973.

PASSED this 5th day of November, 1973.

KING COUNTY COUNCIL
KING COUNTY, WASHINGTON

John T. O'Brien
Chairman

ATTEST:

Dorothy M. Owens
ACTING Clerk
King County Council

APPROVED this 8th day of November, 1973.

John D. Spellman
King County Executive

WETLANDS AS OPEN SPACE[1]

AN AMPLIFICATION AND AUGMENTATION TO THE COMPREHENSIVE PLAN FOR KING COUNTY

INTRODUCTION

Wetland areas occur throughout King County near rivers, streams, and lakes and in glacial depressions on the uplands. Usually relatively small in size, they offer variety and interest to the scene and provide locations for plant and animal life that is dependent upon the special conditions of wetland environments. They also may create problems, particularly in urban areas, of insect control or, where development encroaches upon them. The intent of this section is to describe wetland areas, indicate the problems and opportunities inherent in them and to propose suitable criteria and policies for treating them.

DEFINITION

Wetlands are tracts of low-lying land which are saturated with moisture much or all of the year and often overgrown with vegetation. Wetland tracts include, but are not limited to, marshes, bogs, and swamps. Distinctions between marshes, bogs, and swamps are imprecise. However, each of these different types of wetland have been described by Rigg[2] as follows:

[1] See also discussion of saltwater marinelands in other sections of the Open Space Element.

[2] Rigg, George B., Peat Resources of Washington. Department of Conservation, Division of Mines and Geology. 1958, p. 3.

Marsh - A low flat area on which the vegetation consists mainly of herbaceous plants such as cattails, bulrushes, tules, sedges, skunk cabbage, and other aquatic or semi-aquatic plants. Shallow water usually stands on a marsh, at least during a considerable part of the year. The surface is commonly mud or muck, and no peat is present.

Bog - A depression or other undrained or poorly drained area containing, or covered with, peat (usually more than one layer) on which characteristic kinds of sedges, reeds, rushes, mosses and other similar plants grow. In the early stages of development the vegetation is herbaceous and the peat is very wet. In middle stages the dominant vegetation and the peat, at least near the surface, may be comparatively dry.

Swamp - A swamp is similar to a marsh except that trees and shrubs comprise the characteristic vegetation.

ORIGIN AND DEVELOPMENT OF WETLANDS

Shallow ponds and backwaters of river margins are the usual origin of marshes. Here, water-loving, herbaceous plants can gain a foothold and create a marsh environment. Where water level remains high, the marsh may live on indefinitely. In those locations where a gradual filling-in process from dead plants occurs, the marsh eventually will turn into a sedgy meadow. Such marshes also are created where rivers and streams braid out into a valley, forming deltas.

Bogs are normally found on regions that were covered by a series of glaciers up until ten thousand years ago. Huge ice blocks, buried in sand, gravel and debris, later melted, forming "kettle-hole" lakes with no inlet nor outlet. These deep water-filled basins, with steep sides and poor drainage, are the source of our bogs of today. They can be found in various stages of development, ranging from those that are still largely water, surrounded by a deep mat of vegetation, to those that are completely transformed to vegetation over a wet or mucky base. Each type of wetland has its own distinct ecosystem and is unique in the type and variety of plant and animal life it supports.

SOIL ASSOCIATIONS

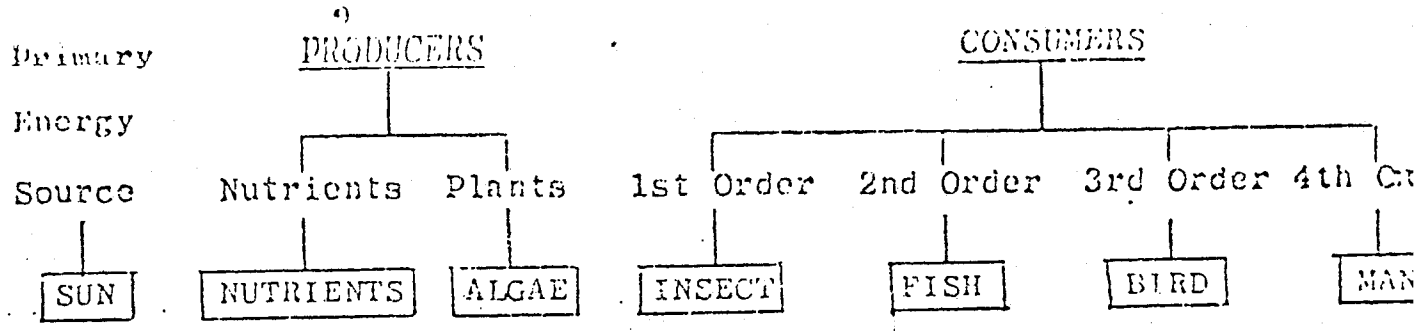
Under natural conditions, wetland conditions can be correlated with certain soils as identified by the Soil Conservation Service of the Department of Agriculture. The soils can be generally described as poorly drained soils in flat terraces adjacent to small streams.[3]

PLANT AND ANIMAL ASSOCIATIONS: THE LIFE CYCLE

Wetlands afford a marvelous opportunity to observe the chain of life which starts with the primary energy source, the sun. An example of how the pathway of energy progresses through a food chain in a typical

[3] In King County, these soil types include the Norma, Bellingham, Orcas, Shalcar, Seattle, Tukwila, Puget, Snohomish, Renton and Woodinville soils where these have not been drained and developed for agriculture or other uses. (See appendix for description of soils.)

wetland may be illustrated by the following simple diagram:



A complex food web is formed through the interaction of many food chains. Interruption in any one of these food chains can create an imbalance in the whole system, an imbalance that must be compensated for in some manner. In some cases, the imbalance may result in the eventual destruction of a sensitive species of flora or fauna.

It is interesting to observe some typical plant-animal associations that exist in the wetlands of King County. One extensive area that may be familiar to many people, even if only from fleeting glimpses out a car window as one travels on either Interstate 90 or Interstate 405, is the Mercer Slough area in the City of Bellevue. This is a peat bog-marsh expanse, some 500 acres in size, that was created when Lake Washington was lowered in connection with the construction of the Hiram Chittenden Locks and the Ship Canal between Puget Sound and Lake Washington. It has only survived the encroachment of urban development because of the great depth of the natural peat deposits and the resultant difficulty and expense encountered in constructing buildings on such poor footing. For an interesting account of the history of the past and present

environment of this area, the reader is referred to the "Mercer Slough Environmental Impact Statement Draft," prepared by the City of Bellevue in 1971.[4] Examples of the type of flora and fauna that still can and do exist in this urban-area wetland, according to the report, are: types of flora - algae, duckweed, pondweed, loosestrife, cattail, giant bulrush, grasses, forget-me-nots, water celery, lady fern and skunk cabbage, with various kinds of trees, such as willos, alders, and cottonwood on the drier edges. Fish species of Lake Washington that can feed on the plant and insect life in the dredged channels are rainbow trout, large mouth bass, yellow perch, sunfish, bullhead, and catfish. Many types of insect life, such as dragonflies, damsel flies, caterpillars, whirligig beetles, mosquitos and water striders can be observed. Bird life includes the resting birds of the tree and shrubbery marsh edge as well as residents of the marsh itself. These range from the common robin to the less common ruby-crowned kinglet, from small song sparrows and marsh wrens to bitterns and grebes, coots and mallard ducks. It is suspected that beavers and muskrats may be the only large animals occupying the swamp area now, and even these may be limited in number. Such habitats in other more remote areas, however, would still attract skunk, otter, mink, weasel and raccoons as well as cougars and fox.

Another example of a wetland preserve in an urban area is Foster Island, a portion of the University of Washington Arboretum property. Here, the more sociable and hardy

[4] Mercer Slough Environmental Impact Statement, Draft, Bellevue, Washington, 1971.

species of wildlife co-exist with the intrusion of people on interlacing trails and with automotive traffic on the approaches to the Evergreen Point Floating Bridge. To observe wildlife that is more sensitive to the encroachment of man (such as the rare and beautiful wood duck), one must unobtrusively visit one of the more remote wetland areas where such species still live.

ARE WETLANDS WASTELANDS?

Traditionally, wetlands have been regarded as lands of little or no value, unfit for productive use, unsightly, a nuisance, or a hazard. They have been indiscriminantly filled, drained, or sprayed with pesticides. They have been used as a convenient final resting spot for man's waste.

Public policy has usually encouraged this kind of action through public development projects, rezoning, and health department rules and regulations. The pressures of urban growth as well as the idea of "growth for its own sake" have been instrumental in affecting public attitudes and policies.

While it is true that many "reconditioned" wetlands are now highly productive and useful, at least from man's point of view, there are many other cases where man's "improvement" of the original situation is highly suspect. Saltwater marshes, necessary in maintaining the food chain of economically valuable sea life, have been destroyed, certain species of wildlife have been rendered

extinct or nearly so, natural drainage reservoirs have been filled, water tables have been lowered, and construction has been allowed on highly unstable material with its potential hazards.

Within the United States, 127 million acres of marshes, bogs, and swamps have been reduced to about 74 million acres; the rate of disappearance of these lands is one percent each year.[5] In King County, the total acreage of all existing wetlands has not been measured. However, a recently published source makes an estimate of 12,540 acres in more than 340 bogs,[6] and a 1952 Soil Survey Report shows another 223 acres in marshes.[7] In other words, the organic, or bog, soils constitute only about one percent of the total land area of King County. In addition, there are other soils which are poorly drained and which have not been cleared, or have reverted back to wetland areas because of inadequate drainage.[8]

Charles Riggs, in a 1956 study, Peat Resources of Washington,[9] describes in detail 46 peat bog areas in the County, some of which since have been depleted by mining

[5] Niering, William A., The Life of the Marsh, McGraw Hill, Inc., 1966, p. 164.

[6] Livingston, Baughn E., Jr., Geology & Mineral Resources of King County, Washington. Bulletin No. 63. State of Washington Department of Natural Resources, 1971, p. 87.

[7] Soil Survey, King County, Washington. U. S. Department of Agriculture, Series 1938, No. 31, September, 1952. Areas of Norma, Bellingham, Woodinville, Renton, Snohomish, and Puget soils. (See Appendix).

[8] Ibid.

[9] Rigg, op. cit.

or have been filled. King County has virtually no tidal marshes, and the other wetlands of the County are all relatively small in scale as compared to the vast wetland areas of many other states such as Wisconsin, Maine and Florida.

Although removal of some of the remaining wetlands in the County may well be justified, it is essential that an evaluation system for determining true cost/benefits be put into effect in order to allay future doubts as to the wisdom of such actions.

Increasing public concern and interest in wetlands has created a number of moves to save such areas in their natural state in the County. Examples include Bellefields Park in the Mercer Slough Area and Foster Island, both mentioned earlier, Ronald Lake in the Shoreline School District, Dumas Bay in the Federal Way Area, and plans to reclaim a former marsh area at the County's Luther Burbank Park.

COSTS AND ASSETS TO REMOVAL OF WETLANDS

Peat spaghnum bogs may be of commercial value where material of sufficient quality and quantity is located close or accessible to ready markets. In the King County Area, there have been and still are a number of commerical peat bog operations. Ronald Lake, in the Shoreline Area, is an example of a former commercial operation; in 1969, there were still seven commercial peat producing areas, two of which are located at Bow and Arbor Lakes in the Highline District. During the past ten years production generally has been around

17,000 tons per year.[10] Sometimes areas where peat has been commercially mined can be converted into small lakes for recreation or as assets to residential developments.

In some areas, the mosquito problem is so great that there is a real need to exercise some form of control over this nuisance, particularly where it occurs near urban concentrations. Of course, in rural or undeveloped areas, this problem may only seriously bother a relatively few number of people. Where natural controls are not adequate, such as encouraging or even introducing forms of life that feed on mosquito larvae and adults, other measures may be necessary. Proper manipulation of the water level may be one answer. Draining or filling may be the best answer if other alternatives fail and if detrimental effects do not outweigh the advantages of this solution. The use of pesticides has been another traditional control which has both advocates and opponents.

Where removal of wetlands appears to be the best answer to providing needed additional acreage for urban or agricultural purposes, the costs and benefits of such action should be carefully weighed. In some cases, the benefits may clearly outweigh possible disadvantages. In others, only negative results may be achieved. The cost of excavation, fill, and drainage may be excessive. For example, local contractors estimate that it costs, on the average, $1½/cubic yard to excavate material and a similar amount to fill in the resulting hole. At this rate, to

[10] Livingston, op. cit.

excavate a 10-acre bog to a depth of 10 feet and fill it with material suitable for development would cost $481,000, assuming that there is no market for the excavated material.

Foundation conditions for industrial buildings may be poor or unstable; peat areas, in particular, require preliminary dredging, deep piling, or floating of structures on the surface. Soil percolation conditions may not allow for good drainage, either for septic tank systems or storm water run-off. Wetland soil types and artificial fills have extremely unstable characteristics in times of earthquake making them hazardous for certain types of construction.[11]

One difficulty which may arise where wetlands are retained in urban areas for drain water catchment purposes is that they will also entrap oil and other pollutants from streets and other paved areas. Filtering or anti-pollution controls may be necessary where this becomes a serious problem.

VALUE AND CONTRIBUTION OF WETLANDS

Wetlands provide a habitat or a food source for flora and fauna unique to or dependent upon them. Certain species cannot exist for long elsewhere except perhaps under carefully controlled and designed artificial circumstances. For example, the seedheads of cattails, which are only found in wetland areas, provide an important food source for the red-winged blackbird. These attractive songbirds are not usually found at any great distance from the area where cattails are present. Frogs are a well-known example of a species dependent upon shallow ponds and marshes for their survival. They, in turn, consume a tremendous number of insects (including

[11] Livingston, op. cit., Table 3

fish (when in the tadpole stage), larger birds and snakes. Ducks feed on submerged water plants located in marshes and small ponds and on grains. During periods of migration, waterfowl of all kinds are especially dependent upon wetland resting and feeding spots located at regular intervals along their path. King County is in the path of the Pacific flyway migration pattern of many birds, and the marshes are an important ingredient in maintaining the life of many of these migrants.

Bog areas may exhibit unique vegetation; for instance, labrador tea, swamp laurel, and mosses may survive where most other plants cannot because of the lack of available minerals.

Marshes, bogs and swamps provide an educational storehouse of material for those who have the interest and inclination to delve into this subject area. In some bogs, the various stages of plant succession are well-defined, making them valuable for outdoor classrooms and scientific study. Where provision is made for people to observe and understand the properties and characteristics of wetlands at close range (as in the City of Bellevue's Bellefields Park), the educational value can be considerably enhanced and made available to a wider range of people. This sort of facility is invaluable as an educational tool for school teachers and other youth leaders.

Some types of wetlands may also serve a recreational function where it is possible to provide such facilities as canoeing or pedestrian trails, wildlife observation stations,

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[12] Livingston, op. cit., Table 3

GOAL: Wetland areas that have value for water retention, wildlife habitat and general open space, should be retained in a natural condition.

CRITERIA FOR PRESERVATION VERSUS REMOVAL

WL-1 Preserve those wetland areas:

a. That have a continuing scientific or educational value due to their location, size, or content (to be determined by experts in the field);

b. That fall within a plat or planned unit development presented to the County for approval and can contribute to accomplishment of the open space goals of the County or solution of existing or future storm water drainage problems;

c. One (1) acre or more in size, located within a publicly owned park or open space system unless overwhelming evidence can be supplied that such wetland is a hazard to health or safety;

d. That clearly contribute to storm water flood control or to maintenance of domestic water supplies, minimum desirable stream flows or lake water levels;

12 As a practical matter, the County generally is not concerned with scattered wetlands of less than an acre in size except as these may be included within or adjacent to other types of open space. Some larger wetlands may also escape control simply because information concerning them is not currently available to the County.

e. That contribute to control of undesirable siltation or soil erosion;

f. That currently or potentially serve a useful recreational function for a significant number of users;

g. That make a significant contribution to the scenic view from nearby travel routes, residential or recreational areas;

h. That have value for agricultural use as determined by the criteria for agricultural lands (see Agricultural Lands as Open Space section of report);

i. That clearly represent a potential hazard for develepemnt by reason of flooding or other documented reason;

j. That are resting, feeding, or nesting spots for migratory water fowl, other birds and mammals.

WL-2 Preserve or remove those wetland areas: (as determined by cost/benefit analysis, consideration and review by the public and/or other relevant information.)

a. Where removal may have a detrimental effect on storm water control, domestic water supplies, minimum desirable stream flows or lake water levels;

b. Where the potential proposed use may be detrimental to environmental quality.

WL-3 Remove those wetland areas:

a. That are clearly demonstrated to be hazardous or create an extreme nuisance that cannot be remedied by alternative means at reasonable cost;

b. Where redevelopment is proposed that clearly has superior benefit and there is minimal adverse environmental impact;

c. Already being mined for peat or other commercially valuable products where proposed re-use has no adverse environmental impact.

IMPLEMENTATION POLICIES

WL-4 Dedication of wetland areas that substantially meet the local criteria should not only be accpted, but be encouraged, by the County through such means as:

a. Encouraging the use of planned unit development and platting procedures where such land can suitably be made a part of the required open space;

b. Providing information to property owners regarding available income or estate tax deductions.

WL-5 Development rights for that portion of tax title land which meets wetlands criteria should be retained in the public domain.

WL-6 Property owners of wetland property that substantially meets the intent of the criteria should be encouraged to file for tax relief under the provisions of the Open Space Taxation Legislation. (RCW 84.34).

WL-7 Further means for financing and acquiring development rights of those wetland areas desirable as permanent open space should be investigated.

WL-8 Continue to utilize existing available funds and seek additional funds to acquire full fee or partial ownership rights to as much park-recreation land as is appropriate and justifiable in wetland areas.

WL-9 Encourage school districts to acquire wetland areas, where appropriate, for use as permanent outdoor educational laboratories.

WL-10 The County should prepare, adopt, and apply a Wetland Overzone for those wetland areas not covered by the Flood Overzone.

WL-11 Knowledge, including maps, regarding areas that are considered to be hazardous to development should be made readily available to developers, property owners, lending institutions, realtors and others who are either potential users of these areas, or are in a position to influence those users.

WL-12 State Game Department aid should be sought in the preservation of those wetlands that are significant wildlife feeding, resting or nesting areas.

WL-13 County permits granted for the mining of commercially valuable peat from bogs should specify the area's rehabilitation and final use as open space wherever feasible.

* * * * * *

DESCRIPTION OF SOILS
(See source note)

Bellingham Series - The Bellingham Series is made up of poorly drained soils. The surface layer is very dark brown silt loam about eleven inches thick. The subsoil is mottled gray silty clay loam about 49 inches thick. These soils formed in alluvium under grass and sedges. They are mostly in nearly level depressions on the upland glacial till plain.

Norma Series - The Norma Series is made up of poorly drained soils. The surface layer is black sandy loam about ten inches thick. The subsoil to sixty inches and more is dark grayish brown and dark gray sandy loam. They have formed in alluvium under sedges, grass, conifers, and hardwoods. They are in basins in the glaciated uplands and along the stream bottoms. Slopes are -0- to 2 percent.

Orcas Series - The Orcas Series is made up of very poorly drained sphagnum moss with dark reddish brown surface layers and yellowish red underlying layers. They are formed in sphagnum moss with minor amounts of Labrador Tea and cranberry. They are in basins in the rolling glaciated uplands. Slopes are -0- to 1 percent.

Puget Series - The Puget Series is made up of poorly drained soils. The soil to about 45 inches is dominantly mottled dark grayish brown and grayish brown

and more is gray silty clay. They have formed in alluvium under sedges and grass in minor depressions of the river valleys. Slopes are -0- to 1 percent.

Renton Series - The Renton Series is made up of somewhat poorly drained soils. They have a very dark grayish brown silt loam surface layer about 6 inches thick and a mottled dark grayish brown very fine sandy loam and fine sandy loam subsoil about 10 inches thick. The substratum is mottled black sand to 60 inches and more. These soils formed in alluvium and occur in river valleys. Slopes are -0- to 1 percent.

Seattle Series - The Seattle Series is made up of very poorly drained organic soils. They have black muck surface layers about 11 inches thick over a dark reddish brown, black, very dark brown, and dark brown mucky peat to 60 inches and more. These soils formed in peaty muck and mucky peat predominantly from sedges. This soil is in depressions and valleys on the glacial till plain and also in the river and stream valleys. Slopes are -0- to 1 percent.

Shalcar Series - Soils of the Shalcar Series have muck and peaty muck layers stratified with and overlying mineral soils at depths of 16 to 30 inches. They are very poorly drained. The muck is very dark brown, and the underlying stratified mineral material to 60 inches and more are mottled grayish and grayish browns. The soils have formed in deposits of sedge peat overlying

alluvium in the stream valleys and rolling glaciated uplands. Slopes are -0- to 1 percent.

Snohomish Series - The Snohomish Series soils are poorly drained. They have a very dark grayish brown and grayish brown silt loam and clay loam surface layer and subsoil about 17 inches thick. This overlies black mucky peat about 10 inches thick. The substratum to 60 inches and more is dark gray loamy fine sand. These soils formed in alluvium in stream valleys. Slopes are -0- to 2 percent.

Tukwila Series - The Tukwila Series is made up of very poorly drained organic soils. The profile is dominantly black to very dark brown muck to 60 inches and more. These soils formed in decomposing sedges, rushes, grass, and some shrubs. Tukwila soils occur in wet basins of upland depressions and stream bottoms. Slopes are -0- to 1 percent.

REFERENCES

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