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PIERCE COUNTY WETLAND MANAGEMENT STUDY  
ANALYSIS OF WETLAND RATING SYSTEMS

JUNE, 1988

Pierce County Planning and Natural Resource Management  
Tacoma, Washington

The preparation of this report was financially aided through a grant from the Washington State Department of Ecology with funds obtained from the National Oceanic and Atmospheric Administration, and appropriated for Section 306 of the Coastal Zone Management Act of 1972.

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## ABSTRACT

Wetland rating systems attempt to distinguish among wetlands by assigning a value to each wetland based on its individual functions. They provide information that can help to facilitate a balance among development, conservation, and other interests. However, wetland functions and values are poorly understood, and information used to develop rating systems may not adequately foresee future negative impacts of wetland development. Two wetland assessment systems designed for nation-wide use are the Reppert method and the Adamus method. The Reppert method is designed to guide the U.S. Army Corps of Engineers in making decisions about permit applications involving wetlands. The Adamus method is designed to aid in evaluating wetlands in order to minimize the impact of highway construction upon them. The New York wetland classification system is one example of a state-wide system. While Washington has no state-wide system, wetland rating systems in King, Island, and Snohomish Counties and the City of Bellevue provide examples of systems that are in place in the State. One of three wetland rating system alternatives could be used in Pierce County. A system based on simple criteria could be developed relatively easily, but would be prone to inaccuracies. A system based on technical criteria would be more accurate, but would be more costly to implement. The option of developing no rating system is the recommended option. Rating systems are not, at this time, capable of providing the information required to protect Pierce County wetlands as they should be protected.

ACKNOWLEDGMENTS

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## WETLAND RATING SYSTEMS

In 1986, the Pierce County Department of Planning and Natural Resource Management began a study concerning wetlands within Pierce County. The first step in the process was to conduct a wetlands inventory, which covered 498 square miles of the County. Wetlands located during the inventory were compiled into an atlas.

The Department of Planning and Natural Resource Management is currently conducting a public education and participation program to elicit citizen recommendations concerning how to manage wetlands throughout the County. These recommendations will be incorporated into a proposed wetlands management plan that will be presented to the Pierce County Planning Commission and Pierce County Council for public review and comment. Following this review, a Pierce County wetlands management plan will be adopted.

There are many means being used nationally to manage wetlands. One technique that is used in some existing wetland management programs is the rating of wetlands. A wetland rating system categorizes wetlands according to certain characteristics. Management plans are then developed around the rated wetlands.

Experts disagree about how well the rating of wetlands actually works in management programs. Some argue that rating systems provide a logical framework for making land-use decisions. Others feel that management programs developed around rating systems sacrifice the wetlands that are rated as less important.

In developing a plan to manage its wetlands, Pierce County may want to consider some type of rating system. This report will provide general information about rating systems. It will review some existing systems and discuss the factors that typically influence their development. The report will also provide a recommendation to the County Council on whether or not to implement a rating system for Pierce County.

### What are wetland rating systems?

It is widely acknowledged that wetlands generally provide an array of important functions and values. And many functions and values are directly beneficial to society (see Pierce County Wetlands Management Study: Phase I Report, 1987).

However, individual wetlands vary widely in their specific characteristics, and in their ability to perform certain functions. In addition, people perceive wetlands differently, so there are many differing opinions about which features of wetlands are most important.

Rating systems attempt to distinguish between wetlands by assigning a value to each wetland based upon its individual functions. Some rating systems determine the importance of, or rate, a wetland's performance of a set of specific functions. Others concentrate on the overall importance of the entire wetland.

Several terms are used in describing wetland evaluation systems, including "classification," "assessment," "rating," and "ranking." Although these terms are sometimes used interchangeably, they each connote slightly different meanings. For the purposes of this report, the terms are defined as follows.

The term "classification system" refers to a method distinguishing among wetlands according to their biological, physical, and chemical characteristics. One widely used classification system is the system developed by the U.S. Fish and Wildlife Service (Cowardin 1979). This system was devised to classify wetlands nationally. Like most classification systems, the Cowardin method addresses tangible properties and does not assign value, or levels of importance, to the wetlands. It assigns wetlands to general categories using water and vegetation types, and has the capacity to refine the classification by adding increasingly specific descriptors.

Wetland "assessment systems" determine the extent to which certain processes (functions) and properties (values) occur within a specific wetland. Some assessment systems also include a procedure to rate or rank wetlands. Using field observations and other tools such as maps, the evaluator is able to determine the extent to which a certain function occurs within the wetland site. For example, an assessment system may indicate that a wetland has a high, medium, or low ability to perform a function such as floodwater storage. Some assessment systems score whole wetlands cumulatively. Like classification systems, assessment systems generally do not assign a level of importance to the functions they address. Because they document the extent to which characteristics and functions occur within a wetland, assessment systems are useful for developing, reviewing, and monitoring wetland mitigation proposals.

Wetland "rating systems" distinguish wetlands by assigning some form of importance to them. Defining what is important in terms of wetland characteristics is done by the individual or group that is developing the system. For example, a wetland might be rated as an "outstanding," "significant," or "ordinary" resource. The "outstanding" category might apply to wetlands exhibiting certain features considered to be unique. A wetland is rated by comparing it to a predetermined set of standardized criteria, which the persons using the system think are important.

"Ranking systems" compare wetlands to one another instead of to a set of standardized criteria. Under this type of system, each wetland is evaluated and scored according to its performance of certain functions, as compared to all other wetlands under consideration.

#### Applications of rating systems

Rating systems were initially designed to help agencies and private organizations identify and prioritize wetlands for acquisition. They have since been applied in regulatory programs. Because of the inherent variability of wetlands, some experts feel that it is not necessary, practical, or equitable to apply the same protection standards to all wetlands. A rating system can provide a framework for protecting wetlands by determining whether certain functions or features are present. For example, development in or adjacent to a wetland rated as "exceptional" might be completely prohibited, while certain activities in or near a site rated "ordinary" might be permitted under certain circumstances.

Rating systems can also help agencies identify where to concentrate their efforts. Faced with the rapid rate of wetland loss and limited time and money, some wetland managers are of the opinion that efforts should concentrate on wetlands of higher value, before those are lost (Barnard 1985).

#### Developing a rating system for regulatory purposes

Before devising a wetland rating system, a decision must be made whether to protect all wetlands equally, or to distinguish between wetlands, rate them, and then apply different levels of protection to certain categories.

The kind of rating system that can be created will also be limited by the amount of information available about local wetlands. Before a decision can be made to rate wetlands, it must be known whether objective, dependable, site specific data are available, or whether that data must be obtained.

Once it is decided what kind of protection is preferred, and what kind of information is needed, four additional factors must be considered:

1. defining the purpose of the rating system;
2. deciding which wetland features or functions are to be considered;
3. deciding how the wetlands will be classified; and
4. developing standard criteria for each classification.

Each of those four factors is discussed below.

Clearly understanding the purpose or objective of a rating system helps to set goals for the system and helps to maintain a clear focus. Some possible objectives include:

1. creating a list of priority wetlands for acquisition;
2. identifying sensitive wetland sites and directing development away from them to areas that are less environmentally sensitive;
3. identifying critical areas where management efforts should concentrate; and
4. identifying special wetlands that will be rigorously protected.

Once the purpose for developing a rating system has been defined, then it must be decided which wetland features or functions will be most helpful in evaluating the wetlands of concern. This decision will influence the design of the rating system. For example, if the goal of the project is to manage wetlands for storm and flood water control, the hydrologic functions and water quality maintenance capability of wetlands are the most important functions to measure. However, if priority wetlands for acquisition are to be identified, the greatest concern may be with features such as absence of measurable human impacts, vegetative diversity, or uniqueness of the site. In another example, if wetlands are valued as unique ecological units, all functions may be considered important and many characteristics of each wetland will have to be evaluated.

Wetland rating systems generally use a hierarchical scale that may have between two and six categories, which are labeled to reflect their relative importance. Labels

can be numerical, or consist of descriptive words or phrases. For example, in a simple rating system wetlands might be evaluated using a numerical hierarchy where there are three categories defined as: 1 (outstanding wetland); 2 (significant wetland); or 3 (wetland of low concern). In classification systems, values are not stated directly with hierarchical labels. Instead, relative importance is reflected in the different amounts of protection afforded to wetlands in each of the classes.

After selection of the most appropriate functions to be used in the rating system, a set of criteria must then be established against which all the wetlands of interest can be evaluated. These criteria become the standard to which each wetland is compared. They may include characteristics such as size, wetland type (as defined by Cowardin 1979), presence of unique plants or animals, geographic location, or association with other bodies of water. As an example, in order to rate highest, a wetland might have to be over 10 acres in size and contain open water, and equal proportions of emergent, and shrub-scrub plant species.

The rating criteria used to define each hierarchical category should correctly identify and rate wetlands in terms of the purpose that were identified for the rating system. After the rating system has been developed, the following questions should be asked. Is the rating system:

1. compatible with the identified goals in the wetlands program and existing wetland laws;
2. designed so that the wetlands fall into a normal distribution; (That is, do most wetlands fall in the intermediate categories, with only a few in the highest and lowest categories?)
3. defensible if challenged in a court of law; (The criteria developed to compare wetlands should use objective, site specific field data.)
4. easily used and understood by staff implementing the system, by developers, and by the general public; (The rating system should be compatible with the expertise of the people who will use it.)
5. clear in its use of technical words and scientific concepts;
6. compatible with the available budget, data, and skills of the agency using it;
7. dependent on evaluating the entire wetland, versus individual portions of the wetland; and
8. able to be updated, as more wetland data is obtained?

Using a wetland rating system can be controversial



There is general agreement that wetland rating systems are valuable tools for acquisition efforts. However, their use in regulatory programs is controversial. Some experts see the systems as a strong asset to the implementation of regulations while others feel their use is inappropriate.

#### Some positive aspects of rating systems

Those who view rating systems as an asset to regulatory programs say the systems are helpful in identifying sensitive wetlands that should be protected. Rating systems can distinguish valuable sites from wetlands of low concern. Land managers can then develop plans that protect the special areas but allow certain activities in less highly valued wetlands (Wrye 1987). By directing development away from important wetland areas toward those that are less environmentally sensitive, rating systems can help to balance the often conflicting interests of managing environmental quality, public health and safety, and the interests of community growth. Allowing some development activities in low rated wetlands may make adopting wetland protection plans more politically acceptable to members of the development community.

Rating systems may also be useful in evaluating development project proposals that concern wetlands. Because they require data gathered from a field visit or other source, rating systems can provide landowners, consultants, and planners with specific site information that might not otherwise be easily available. Rating wetlands may also simplify and expedite the permit review process by identifying potential development problems early, before substantial amounts of funds have been committed.

#### Some negative aspects of rating systems

The field of wetland science is young and incomplete. One criticism of wetland rating systems is that they depend on some aspects of wetland ecology which are poorly understood. Some experts contend that the fate of many individual wetlands is being decided in an information vacuum (Strikland 1987). For example, little is known of how individual wetlands interrelate. Consequently, if it is decided that low rated wetlands do not need protection, future negative impacts of that decision may only become evident to future generations.

If a decision is made not to protect low rated wetlands, development may actually be accelerated by directing activities towards them and away from highly rated wetlands. Although negative impacts from the loss of one low rated wetland may be minor, the cumulative affect of the loss of many such wetlands may be significant. In addition, designating a wetland as "low value" may make a legal defense more difficult if protection measures are challenged with litigation (Lonard et al. 1981).

Another criticism of wetland rating systems is that some wetlands may be rated incorrectly, due to the lack of accurate information. Many aspects of wetlands are difficult or impossible to evaluate or quantify objectively. This results in imprecise or subjective decisions being made by resource managers or wetland evaluation teams. Many experts argue that subjectivity is inherent in wetland assessment techniques, which is a major drawback to using them (Lonard et al. 1983, Wrye 1987).

#### A review of some existing wetland rating systems

Many federal, state, and local agencies have developed wetland assessment and rating systems. Lonard et al. (1981) reviewed 20 different federal and state wetland assessment techniques and found that they varied in complexity, and in the amount of data and time needed for site evaluations. They also found variation in the number and expertise of people needed to use different assessment systems.

In another review of assessment systems conducted in 1984, the U.S. Environmental Protection Agency (EPA) concluded that the "most effective" methodologies were also the most labor and time intensive. Their report stated that, "quick screening" methods, so far developed, do not adequately evaluate the wetland's performance of functions nor its potential to withstand impacts. EPA also noted that most assessment systems are really only useful when applied to the regions for which they were designed. This is due to differences in wetland ecosystems resulting from differences in geographic regions, climatic conditions, and other variables.

#### Two examples of wetland assessment systems designed for nationwide use

Example 1: The Reppert Method

Reppert et al. (1979) designed a wetland assessment technique for the U.S. Army Corps of Engineers (COE). The purpose of the technique is to guide COE in making decisions about permit applications involving to wetlands. Reppert et al. intended the system to be used on a short term basis, until a scientific data base could be completed (Wrye 1987). The assessment system evaluates the performance of wetland functions using a checklist of site specific characteristics. It relies on field data and other available information about each wetland. Wetlands are scored according to whether or not they demonstrate high, medium, or low performance of specified functions. The evaluation process is recorded in writing so that all decisions made during the assessment process can be reconstructed. Each assessed wetland is given a numerical score, a narrative summary, and ranked against other wetlands included in the analysis.

The assessment system developed by Reppert et al. relies upon obtaining specific information about each wetland. Some of the data collected include frequency of inundation, a wetland's geographic relation to other water bodies, its shoreline characteristics, primary productivity, and the number of animal and plant species that it supports. The Reppert system is time intensive in terms of data collection. Lonard et al. (1983) estimate that an average of 16 person hours are required to complete the assessment for each wetland. Application of this system also requires trained personnel with expertise in wetland ecology.

A drawback to the system is that some of the required technical data is not easily available for every wetland being assessed. Therefore, the system tends to be subjective and management decisions based upon it may not be easily defensible.

#### Example 2: The Adamus Method

Another assessment system that has been applied in several locations across the nation was developed by Paul Adamus for the Federal Highway Administration in 1983. Its purpose is to aid in evaluating wetlands in order to minimize the impact of highway construction upon them. Many consider this technique to be the "state of the art" in wetland assessment.

The Adamus technique rates and ranks wetlands and evaluates the performance of wetland functions. It involves three procedures. The first procedure, called "threshold analysis," rates how well each wetland performs 12 specific functions.

The second procedure, referred to as "comparative analysis," ranks each wetland's performance of the functions by comparing it to all the other rated wetlands in the system.

In the threshold and comparative analyses, wetlands are assessed according to their opportunity for, and effectiveness in, performing functions. Adamus defines "opportunity" to mean whether or not a wetland has the opportunity to fulfill a specified function, and "effectiveness" to mean a wetland's ability to perform that function when given the opportunity. These procedures also assign a significance value (defined as the value that society places on the performance of a function) to each function (Porter 1988). The performance of a function is expressed as high, moderate, or low.

The third procedure in the Adamus assessment technique assesses impacts to wetlands from construction projects. This procedure is also used to select and evaluate mitigation alternatives.

The Adamus assessment system can be cumbersome. It requires answers to as many as 546 "yes" or "no" questions, and has 11 response and summary sheets. The system relies on complex information about each wetland and its surrounding geographic area, and refers to 11 interpretive keys. Adamus states that the procedure takes 4 to 24 hours per wetland to complete, but other sources estimate that more time may be needed. (EPA 1984).

The assessment system developed by Adamus has been subjected to intense peer review. It is considered to be important in the science of wetland assessment. However, it has been criticized as being biased toward east coast wetlands, and not applicable to the Pacific Northwest. The technique has also been faulted as being time consuming, cumbersome to use, and imprecise because evaluation is based on data collected from single site visits.

An example of applying a rating system statewide -- New York

Washington does not have a statewide plan to manage wetlands. New York, however, manages wetlands at the state level.

Under the 1975 Freshwater Wetlands Act of New York, wetlands are regulated using a classification system that distinguishes between them according to the functions and benefits they may provide (Riexinger 1985). The Act applies to all wetlands greater than 12.4 acres and smaller wetlands which are determined to be of "unusual local importance." Protection under the Act varies according to how a wetland is classified. All wetlands covered by the act are regulated, but greater protection is granted to the most highly rated sites. The Act also requires a 100 ft. buffer around every wetland, which may be extended if necessary.

The New York system recognizes 10 basic functions and benefits of wetlands: flood and stormwater control, wildlife habitat, protection of water resources, recreation, pollution treatment, erosion control and sedimentation, education and research, open space and aesthetics, nutrient cycling, and fish habitat. Each wetland is placed into one of four classes depending on how well it performs or provides the 10 functions and benefits. Class I wetlands provide the greatest benefits and functions; Class IV wetlands provide the least.

Forty selection criteria are used to classify each wetland. To be classified as Class I, a wetland must meet one of the following five criteria:

1. it must be a classic kettlehole bog (rare land form);
2. it must provide resident habitat for an endangered or threatened species;
3. it must support an animal species in abundance or diversity unusual for the state or a major region within the state;
4. it must be a tributary to a body of water for which it provides some degree of flood control or provides flood protection for a substantially developed area;  
or
5. it must have four or more of the fifteen characteristics specified for classification as Class II wetland.

The site specific information used to determine a wetland's classification is obtained primarily from remote data such as aerial photos, or soils maps. Field data are collected as time allows by state agency staff. A landowner can contest a specific wetland's classification and the classification will be altered with adequate justification.

The New York wetland classification system considers regional differences throughout the state. This helps to place regionally valuable wetlands into perspective and is viewed as a major advantage to the system.

There are disadvantages to the system. It may not be accurate because it relies on remote sensing data, which invites the system to be challenged. Contested classifications require site evaluations by personnel trained in wetland assessment. Another criticism is that all wetlands must be compared to forty characteristics, which can be complicated, time consuming, and difficult if technical information is not available.

#### Four examples of assessment or rating systems from Washington

At least four agencies use some type of wetland rating or assessment system to help them manage wetlands in Washington. This paper will discuss those employed by King, Island, and Snohomish Counties, and the City of Bellevue.

#### King County

Wetlands in King County are protected under a Sensitive Areas Ordinance established in 1979. The Ordinance prohibits development in wetlands unless special studies show that: 1) the wetland does not perform any of several specific functions; 2) the proposed development would preserve or enhance existing wetland functions. The Ordinance is implemented according to a set of administrative rules. These rules rely upon rating and ranking systems, which depend upon information collected during a wetland inventory conducted in 1981.

Wetlands in King County were assessed during the 1981 inventory. Fifty-three questions, organized into five master categories were asked about each wetland in the inventory. The master categories were: hydrology, biology, visual, cultural, and economic. The assessment was relatively thorough, but required about 10 staff hours for each site. Most of the characteristics that were evaluated required measurements to be taken in the field. Each wetland received a total cumulative score, based upon individual scores obtained in each of the master categories.

The rating and ranking systems developed by King County are based on data collected during the wetland inventory and compiled into the five master categories. Under the ranking systems, individual wetlands contained in a sub-basin are compared and

ranked relative to all others in the same sub-basin. The comparison was based upon the scores the individual wetlands received in each master category. Rank is expressed as a percent. A wetland can be ranked with all other wetlands in a sub-basin and with all other wetlands in the county. For example, the rank of a particular wetland in the biology category may be 56% in its sub-basin, and 35% in the County. The highest rated wetlands are assumed to be of greatest importance.

The King County rating system rates each wetland according to the presence of specific characteristics or unique features. Wetlands are compared to three sets of criteria and are designated as: 1) "unique/outstanding," 2) "significant," or 3) "low concern." To receive the highest rating, a wetland must satisfy at least one of the following criteria:

1. It contains species recognized as federally or state endangered, threatened, or sensitive;
2. It exhibits a nearly equal proportion of open water to vegetative cover in dispersed patches, and has a high diversity or mix of wetland subclasses; (Cowardin 1979)
3. It is larger than 10 acres and has three wetland classes defined by Cowardin 1979, one of which is open water; or
4. It is composed of infrequently occurring plant associations, such as estuaries or bogs.

The King County wetland rating and ranking systems are relatively independent of each other. They share only one set of evaluation criteria.

The King County rating system is objective and defensible, and relatively easy to understand. The assessment system used during the inventory is complex, but the rating system relies primarily on vegetative and wetland classification data. The rating system, therefore, can be used by other jurisdictions that do not have such an extensive data base. Some of the ranking information is complex. However, if ranking is eliminated, the rest of the assessment and rating system is still relatively simple to implement. The information required can be collected during inventories on a site by site basis.

Staff at King County thinks that the assessment, rating, and ranking systems are successful. Their program has not been successfully challenged and no major revisions to the program are proposed (Sheldon, pers. com.).

The King County rating system has been criticized because it emphasizes biological benefits of wetlands such as wildlife habitat. Critics think that it is deficient in considering other attributes such as visual and cultural values, hydrologic functions, and pollution control. Proponents of the system argue that the biological attributes of wetlands reflect the other functions indirectly. They point out, for example, that the criterion of vegetative diversity, which is a biological feature, is also visually pleasing. Supporters of the system also argue that emphasizing biological characteristics such as wildlife habitat is defensible, because scientists have more knowledge of this function compared to others (Lonard et al. 1981).

Another criticism of the King County rating system concerns the use of the rating characteristics named "low concern." Some critics say that this label may foster the idea that lower rated wetlands are expendable. Such an idea could result in acceleration of the rate at which these wetlands are lost to development.

#### Island County

Island County uses its Zoning Ordinance to regulate activities in and around wetlands. The Ordinance provides an overlay zone for wetlands that are not covered under the Washington Shoreline Management Act. The purpose of the overlay zone is based on the assumption that our knowledge about the functions and values of wetlands is limited, therefore, almost all of them should be protected.

Island County rates wetlands as either "unique/outstanding" or "valuable." "Unique/outstanding" wetlands are 1) at least 1/8 acre in size, 2) have protected species or outstanding potential habitat for protected species present, or 3) are composed of predominantly native wetland plant species. "Valuable" wetlands are at least one acre in size and don't meet the above criteria.

Under the Island County Ordinance, "unique/outstanding" rated wetlands cannot be altered. "Valuable" wetlands can be altered with "use approval."



Using the predominance of native wetland vegetation as a rating criterion is unique to the Island County program. This criterion was chosen because it provides a broad approach to rating wetlands that requires minimal formal training to implement. Island County staff does not have the expertise to evaluate wetlands scientifically. They, therefore, need a system that uses characteristics that can be easily distinguished in the field.

A predominance of native vegetation indicates generally the natural performance of many wetland functions, because wetlands that are dominated by native plants have been disturbed less than those with weedy non-native plants. Island County assumes that undisturbed wetlands function more effectively than disturbed wetlands (Dold, pers. com.).

The Island County rating system is simple to use. Wrye (1987) estimates that two hours of staff time are required for each wetland. It is also relatively inexpensive and can be implemented by people who are not trained wetland biologists. However, the system has some problems. Because all wetlands with a predominance of native vegetation are rated "unique/outstanding," some unaltered wetlands are much more stringently protected than originally intended. Also, some terms used in the program are not clearly defined, resulting in conflicting interpretations of how the system should be implemented.

Planners at Island County are currently revising the rating system, defining terms, and reevaluating how certain types of wetlands are handled by the system.

#### Snohomish County

Snohomish County does not have specific County regulations to protect wetlands. However, the Water Resources Group in the Department of Planning is conducting an inventory of wetlands and developing a management plan which may include rating of wetlands. A draft of their proposed wetland protection program is currently available for public review. It suggests varying amounts of protection for wetlands and their buffers, based upon a classification system.

Snohomish County proposes to classify wetlands into five categories denoted A through E, with A having the highest priority for protection, and E the lowest. A wetland will be classified according to its affiliation with rivers and streams, its

wetland type (as defined by Cowardin et al. 1979), and its size (greater or less than one acre). Wetlands in Class D will also be evaluated for their ability to perform one of several critical functions as defined in the draft management plan. Class A wetlands will include riparian wetlands associated with, or having a hydrological connection to, a Class I stream reach; or all protected wetlands that have a sensitive, threatened, or endangered plant, plant community, or wildlife species present.

Class B wetlands are all riparian wetlands associated with, or with a hydrological connection to, a Class II stream reach; or all estuarine or lacustrine wetlands. The remaining classes are defined according to similar parameters.

The proposed classification system has received mixed reviews (Campion, pers. com.). It has been criticized for emphasizing riparian wetlands and stream classifications. The objection to using stream classifications has been raised because Snohomish County's stream inventory is unique in the state. Therefore, the wetland classification system, which is based on the unique stream inventory, cannot be used by other jurisdictions. Other critics say the system ignores the individual character of many wetlands by emphasizing broad classification characteristics. Some also think the system should address regional differences within Snohomish County when wetlands are rated. Lastly, some critics argue that performance of critical functions that define Class D wetlands is difficult to quantify. Snohomish County's Water Resources Group is considering eliminating the classification system from the proposed wetlands protection program because of these objections (Campion, pers. com.).

#### City of Bellevue

The City of Bellevue recognizes wetlands for their important hydrologic functions, especially as they relate to surface water management (Bellevue Sensitive Areas Notebook 1983). Recognition of the importance of this wetland function results from the pressures and consequences of urbanization in Bellevue, such as stormwater management problems.

Bellevue conducted a wetlands inventory, using methodology modified from King County, and designed a classification system to reflect surface water management concerns. The classification system distinguishes between the biological and surface hydrological characteristics of wetlands.

Bellevue classifies wetlands as Types A, B or C. Type A wetlands are all wetlands related to surface hydrology in a Type A or Type B riparian corridor. Type B wetlands are larger than 7200 sq. ft. in area and are not hydrologically related to a Type A or B riparian corridor. Type C wetlands are smaller than 7200 sq. ft. in area and are not hydrologically related to a Type A or B riparian corridor.

Development of Type A and Type B wetlands is prohibited. Type A wetlands require a 50 foot buffer area, while Type B wetlands require a 25 foot buffer area. Some development is allowed on Type C wetlands if appropriate mitigation measures are taken. Appropriate mitigation is determined on a case by case basis.

Some general conclusions about wetland rating and assessment systems as management tools

Pierce County should protect the important environmental resource that wetlands provide. It should manage this resource so that the common interests of the community are represented. The County needs to manage the resource so that community growth is possible. It is a difficult task to balance the interests of the environment, community health and safety, and community growth. As urbanization and development continue to rapidly increase, the problem of how to best manage wetlands becomes more pressing, but also more difficult.

Wetland protection measures that vary according to how individual wetlands are rated may provide an environmentally sound way to manage wetlands. Such management is more likely to be sound if the following points are remembered:

1. People have a responsibility to protect the resource to which societal values are assigned.
2. Each wetland is important in the ecosystem. Therefore, it is important to establish adequate protection for all wetlands. Rating schemes should not be used to lessen existing protection, but should provide extra protection (beyond an established minimum) for special sites (Riexinger 1985).
3. A relatively broad approach to rating wetlands must be used until more scientifically based knowledge about wetlands is available.

4. Reliable and objective field data should be collected for all wetlands in a jurisdiction.

#### Three rating system alternatives for Pierce County

This report will discuss three rating system alternatives that could be used by Pierce County in a wetlands management plan. These include adoption of a rating system based on simple criteria, adoption of a rating system based on technical criteria, and adopting no rating system.

1. Rating System Based on Simple Criteria

A rating system could rate wetlands according to a simple physical characteristic such as size of wetland; alternatively a characteristic could be chosen to represent the performance of a particular function that the County wants to protect. There are benefits to adopting a rating system based on simple criteria.

Information needed may be easily extrapolated from existing wetland data. For example, wetland size can be measured using Pierce County's Wetland Atlas. If the information is not available from existing data, it may be relatively easy to collect on a case by case basis or in a comprehensive wetland study. This option may, therefore, require relatively little time and money since some information is already available about Pierce County wetlands. A rating system based on simple criteria would be easily understood and could be used by staff and other interested parties without extensive training. It would not require a high level of wetland expertise, technical knowledge or skills.

There are, however, drawbacks to adopting a rating system based on simple criteria. Simple selection criteria may be arbitrary and not accurately reflect a wetland's importance. Choosing one simple characteristic to represent a function may not adequately or accurately reflect the wetland's performance of that function. When only one criterion or few criteria are used, the system may not reflect other important benefits of a particular wetland site.

2. Rating System Based on Technical Criteria

Pierce County could adopt a wetland rating system with selection criteria based on numerous characteristics or functions. The degree of sophistication of a

technical rating system could range from one that is relatively simple and does not attempt to be comprehensive to one that is relatively complicated and attempts to take into consideration the full range of wetland features and functions into consideration and is relatively complicated. A rating system based on technical criteria may more accurately reflect the character of wetland sites and their importance than a system based on simple criteria. Site information obtained for a technical rating system could have other beneficial uses such as for land use impact assessment. A more sophisticated rating system would likely be less arbitrary and more sensitive to other benefits provided by a wetland than a less sophisticated system.

On the negative side, in order to be implemented a sophisticated rating system would require a relatively high level of skill and technical knowledge from the staff. Such a system might require detailed wetland data and require the collection of information, on either a case by case basis or through additional inventory work. This type of system would require more time and money be spent by Pierce County to provide the necessary data, since the amount of data collected during the past inventories was necessarily limited by time and money available.

A sophisticated rating system might be relatively difficult for staff and other users to understand. The following is a description of two technical rating systems. The first is less comprehensive than the second.

#### A. Less Comprehensive Technical Rating System

A less comprehensive wetland rating system, similar to King County's system, could be a "middle of the road" alternative. Although a system like King County's does not directly consider values and functions comprehensively, it may adequately reflect a wetland's importance. For example, rating criteria may include size, wetland class and subclass (using the Cowardin system), proportion of open water to vegetation, diversity and intermixing of plant species, among others. If the data needed is not available, it would be relatively easy to collect (and the system and the data could be objective and defensible.) In Pierce County, this type of system could be implemented in one of three ways.

1. Use information from the existing wetland inventory;

2. Require the information be provided by the project applicant; and
3. Provide County staff with wetland expertise through the County to collect necessary information and apply the rating system.

B. Rating wetland using the existing Wetland Inventory

Pierce County could adopt a rating system based on the more objective information collected by the wetland inventory team. Using this information would be cost effective and time efficient since it is already available. However, the method in which this information was collected, it's consistency, and, therefore, its accuracy may invite frequent challenges of the rating determinations. The wetland inventory conducted by Pierce County was designed to map approximate wetland boundaries and collect as much information as time at the site permitted for general reference by County staff, as well as the general public. In addition, because of the restrictions of time and accessibility, only partial evaluations of some large wetland systems were made. Evaluations were made with the assumption that a more detailed analysis of a wetland could be conducted if a project were proposed for the site. In some cases, assessment of certain characteristics, such as the presence and extent of wetland classes within a wetland, were accomplished by extrapolation from aerial photos. Assessments were not always derived primarily from field observations. (Refer to Granger T. 1987 for a more detailed description of inventory methodology.) A rating assigned to a wetland using information obtained solely from the existing inventory of Pierce County wetlands might be subject to challenges.

C. Rating wetlands using Information Provided by Development Proponents

Using the less technical system, wetland rating could be accomplished on a case by case basis using information submitted by a project applicant. The expense would be shouldered by the applicant. It should be noted that in order to rate a wetland, data collection would be required for the entire wetland, regardless of how much of the wetland actually existed on the proponent's property. Having the proponent provide the information used to rate that wetland might represent a conflict of interest. Any challenge to the information provided and evidence to support that challenge would be the responsibility of the County. This system would not provide a predictable wetland management system for the development community. Considerable

expense would be required before an applicant would know what limitations might exist.

D. Rating wetlands using information provided by the County on a case by case basis

A case by case rating of wetlands could also be accomplished using information provided by the County. The County could hire a wetland consultant or a staff wetlands specialist to collect field data. The problem with the proponent's conflict of interest in providing wetland information with which a wetland is rated would be eliminated. However, predictability would still not be provided.

Snohomish County estimates that in 1988 it will review 600-650 projects involving wetlands. If a similar number of projects is prepared in Pierce County, contracting with a consultant could be costly for the County. Establishment of wetland expert staff positions may be more cost effective than hiring a consultant. In addition, if the position created included wetland planning responsibilities, this specialist could review projects involving wetlands, conduct wetland impact analysis, and provide environmental review for Grading, Filling and Clearing permit applications.

E. Comprehensive Technical Rating System

Alternatively, Pierce County could employ a wetland rating system that attempts to comprehensively consider a full range of features and functions, like the Adamus or New York rating systems. The use of this type of system may most accurately reflect a wetland's performance of functions and, therefore, its importance. However, this type of system may not be the most advantageous for a local government. Data needed may not be available. Of all the options, it would be the most time consuming and costly to collect; this type of system may be the most difficult for staff and other users to understand. In addition, as stated previously, the science of wetland assessment is new and incomplete and a system that attempts to be comprehensive may, out of necessity, be based on assumptions that are inaccurate.

3. No Rating System

Pierce County could choose not to rate wetlands at all. This option would be consistent with Pierce County's "Grading, Clearing, and Filling Ordinance" which regulates activities in all wetlands over 2,500 sq. ft. in size, as well as 100 ft. of the adjacent upland. The "no rating" option eliminates concerns about defending the information available through the Pierce County Inventory data base, the cost and time required to collect information needed to rate wetlands, and the involvement of project proponents in rating wetlands. A decision not to implement a rating system would require the adoption of an alternative strategy to protect wetland resources in the County.

#### RECOMMENDED OPTION

Pierce County has an obligation to ensure environmental quality, community safety, and community development needs. This obligation would not be adequately met if a wetland rating system was established for the County at this time. Therefore, it is recommended that Pierce County choose the "no wetland rating" option.

Several factors contribute to this recommendation. First, rating systems were initially designed to prioritize wetlands for acquisition. As a result, these systems were concerned only with identifying the most valuable wetlands. Lower rated wetlands, while not a concern of acquisition efforts, may be seen as expendable when subjected to regulatory programs.

Second, although a rating system based on simple criteria does not require a high level of technical skill to implement, the arbitrary nature of such a system lends itself to legal challenges and inaccurate assessment of a wetland's importance. Conversely, a rating system based on technical criteria requires a level of wetland expertise absent from the Pierce County staff, at the present time.

The existing wetlands data base for Pierce County is inadequate to support a rating system based on technical criteria. A case by case rating of wetlands using technical criteria would require the hiring of a wetland consultant. The cost of the consultant's services would need to be paid by either the project proponent or by the County. At any rate, the County would need to have technical expertise to review an assessment of technical data.



Fourth, the state of understanding about the complex and variable functions of wetlands and their full contribution to environmental and community health is quite limited at this time. Long-term consequences of decisions based on a wetland rating system are not known. The protection of all wetlands will provide a safe margin until more research can be accomplished about wetland functions. If Pierce County is to err in terms of wetland management, it should be on the side of caution. If "marginal" wetlands are allowed to be eliminated, and at a later date research indicates they are ecologically important, they cannot be reconstructed as they occur naturally.

The recommendation against establishing a wetland rating system in Pierce County does not signal that wetland protection is unnecessary. On the contrary, rating systems, at this time, are not capable of providing the information required to protect County wetlands as they should be protected. Satisfactory means of protecting all Pierce County wetlands need to be developed.

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