Chapter 10

Regulation of Environmentally Sensitive Areas and Resources

INTRODUCTION
Aside from wilderness areas, roadless areas, parks, preserves, monuments, wild and scenic rivers, and national and state trail systems, there are other areas of the landscape that are especially sensitive but are not publicly owned, assessed, or controlled. Areas such as the coastal zone of oceans and lakes, wetlands, mountain tops, ridges, and steep slopes pose special problems and risks for development, are ecologically sensitive, and are often key aesthetic resources (Figure 10.1). In this chapter we first outline the existing programs that protect these areas and their aesthetic values. Then we address specific programs and measures to protect air quality, water quality and quantity, archeological resources, and wildlife resources.

SENSITIVE AREA MANAGEMENT AND REGULATION
There is some broad-ranging federal and state legislation designed to deal with the unique problems of specific geographic areas. A number of states have used this “critical area” approach by setting up specific state agencies to control the use of land in particular sections of the state. The most prevalent types of critical area programs are coastal zone management, or shoreline regulation.

Coastal Zone Management/Shoreline Regulation
With the Coastal Zone Management Act of 1972, Congress authorized funding of states to develop planning and regulation programs for their coastlines. In its statement of purpose the act included: “to encourage states to achieve wise use of the land and water resources of the coastal zone, giving full consideration to ecological, cultural, historic and aesthetic values as well as needs for economic development.”1 Many states developed coastal zone management plans under sponsorship of this Act (Figure 10.2).

In one of the most famous coastal environment “disasters,” the Santa Barbara, California oil spill, local public opposition to leasing in the Santa Barbara Channel for oil and natural gas development was based on aesthetic grounds. Following the spill, the offshore platforms were perceived as ugly (Baldwin 1970). According to Baldwin: “Aesthetic arguments did win the two-mile wide buffer zone. However, once Interior determined that such a zone outside the state sanctuary would be sufficient to forestall state leasing in the sanctuary, no further aesthetic arguments were successful” (Baldwin 1970, p. 38). The strong aesthetic grounds against oil and natural gas development were stated in terms of the alleged damage to natural beauty in a complaint for mandatory injunction2 to stop future drilling in the Santa Barbara Channel.

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2 Id.
One landmark occurred when aesthetic considerations were incorporated into coastal zone/shoreland management by the Tahoe Regional Planning Compact\(^4\) in California and Nevada.

The 1969 compact formed an agency empowered to control all land development in the Tahoe Basin. One of the prime purposes of the agency was to protect the aesthetic value of the lake (Figure 10.3) with its deep-blue color, according to Bosselman and Callies (1971). Tahoe’s land use ordinance delineates use districts and limitations on building heights, and refers to the need to “maintain the natural scenic quality of the Lake Tahoe region”\(^5\) and the “protection of views.”\(^6\) A special shoreland ordinance requires permits for all construction and alteration on that shoreline, underlying land, or within the lake. Section 5 of that ordinance stipulates that before a permit is issued there be proof that the natural beauty of the area will not be destroyed.\(^7\) As we have seen in Chapter 9, this approach was not successful in controlling development or scenic impacts in the Tahoe Basin.

A third example is the San Francisco Bay Conservation and Development Commission, which was created by the California Legislature in 1965 to plan for the development of San Francisco Bay (Bosselman and Callies 1971), the Bay Plan has evolved beyond Proposition 20\(^8\) into the California Coastal Act of 1976.\(^9\) The commission was formed partly to prevent the filling in of the bay and partly for scenic reasons. As Bosselman and Callies (1971, p. 109) have stated: "The fact that the Bay is seen so frequently by so many people made it very easy for the average person to visualize its reduction to a ‘river’.”

The California Coastal Zone Conservation Act\(^10\) established a state coastal commission, six regional commissions, and a permit review process for coastal development (Figure 10.4). In a study of the permit process, 43 percent of the permits appealed from the regional to the state commission included aesthetics, view corridors, and facility design (Sabatier 1976, p. 148).

The 1976 act, which evolved from the San Francisco Bay experience has specific language that addresses aesthetic issues:

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\(^5\)Land Use Ordinance #13, adopted 1972, amended 1973, ss. 7.10 et seq.
\(^6\)Id.
\(^7\)Id. Ordinance #6.
\(^10\)Id.
True scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited to protect views to and along the ocean and scenic coastal areas, and where feasible, to restore and enhance visual quality in visually degraded areas.¹³

¹³Id., s. 30251.


Other coastal management/shoreline management programs of note include Delaware's Coastal Zone Act,¹² which restricts manufacturing and industrial uses along the coast. The Delaware State Planning Office takes aesthetic as well as other effects into consid-
eration when reviewing permit applications. Connecticut, Maryland, Michigan, Mississippi, New Hampshire, New Jersey, New York, North Carolina, Rhode Island, Virginia, and Texas also have statutes with aesthetic provisions.13

Wisconsin authorized all counties to enact shoreland zoning ordinances to preserve the beauty of its lakes and rivers.14 The state’s Model Shoreland Protection Ordinance15 delineated land into districts, including conservancy districts, and has restrictions on tree cutting to screen structures as seen from the water.

The Coastal Barrier Resources Act (CBRA)16 represents the first comprehensive attempt to link federal fiscal policy with natural resources conservation.

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13Respectively, Conn. Ch. 440 s. 22a-28; Del. Ch. 66 ss. 6602 and 6604; Md. Title 9 s. 9-102; Mich. Inland Lakes and Streams Act of 1972, s. 281.957; Miss. Title 49, Ch.27; N.H. Ch. 483As.1-b; N.J. Title 13 Ch. 19 s. 2; N.Y. Tidal Wetlands Act. 483 Ch. 25 s. 0101(b); N.C. Ch. 13A-102; R.I. Title 2-1.13; Va. Code s. 62.1-13.1; and Tex. Ch. 33 ss. 001.


CBRA attempts to minimize loss of human life, wasteful expenditures of federal revenues, and damage to natural resources associated with development on coastal barriers along the Atlantic and Gulf Coasts. Noted for their natural beauty, wildlife habitat, and recreational opportunities, the coastal barriers also are prized sites for intensive residential development. The barriers are becoming urbanized at about twice the national rate, in part because of massive aid from numerous federal programs for development and redevelop-ment. Federal aid, by encouraging development, has often contributed to landscape degradation, destruction of natural resources of the barriers, and increased risk to human life.

CBRA limits new federal expenditures or financial assistance within the designated coastal barrier areas. Subject to certain limited exceptions for activities unrelated to development, CBRA prohibits federal financial assistance for the construction or purchase of structures, roads, bridges, facilities, and the related infrastructure. The intent of Congress was to eliminate federal development assistance so as to shift the financial risk and burden of development from the federal government and the taxpayer back to the developers and users of coastal property. Shifting the costs of development back to those who build and live on coastal barriers furthers two objectives: the conservation of natural resources of the coastal barriers and efficient use of limited government funds. South Carolina is also attempting to address restrictions on redevelopment on coastal barriers and coastal wetlands. (For a more detailed review of CBRA, the reader is referred to a comprehensive article by Kuehn 1984.)

Legal Decisions on Shoreland Protection

Many of the aforementioned programs have been upheld in court decisions. The California Supreme Court upheld the constitutionality of the Tahoe Regional Planning Agency in People ex rel. Younger v. County of El Dorado. The California Court of Appeals upheld the decision of the San Francisco Bay Conservation and Development Commission in Candlestick Properties Inc. v. San Francisco Bay Conservation and Development Commission. The Supreme Court of Wisconsin decided in favor of Marinette County ordinances under the Wisconsin Protection Act in Just v. Marinette County. In the last case, the court specifically referred to the need to preserve the scenic beauty and other natural resources of the shorelands.

On November 3, 1977, in Dept. of Ecology v. Pacesetter, the Washington State Supreme Court upheld the use of the police power, under Washington's Shoreline Management Act (SMA), to regulate development on a private waterfront lot on the grounds of protection of aesthetic values alone (Washington DOE 1977). In response to the plaintiff Pacesetter's argument that it was entitled to compensation because protection of aesthetics was not a proper exercise of police power without compensation, the court said:

Much decisional law upholds a government regulation protective of aesthetic values whether or not accompanied or combined with the protection of economic values. Many cases hold protection of aesthetic values alone justify the exercise of police power without payment of compensation. Moreover, the legislature has given expression to this state's public policy of supporting protection of aesthetic values by the enactment of the SMA and similar statutes.

Finally, the shoreline development restrictions implemented by the Adirondack Park Agency in New York State have been upheld in a court decision. The court decided that the agency prohibition against boathouses on shoreline of Oseetah Lake was properly based on aesthetic considerations pursuant to the police power and constituted proper exercise of its discretion.

Wetland Regulation and Aesthetic Values

Wetland laws and policies as they specifically relate to aesthetic values (Figure 10.5) are an important concern. Wetland regulation has become a major issue at the national, state, and local levels of government. The values of wetlands were documented in a multidisciplinary symposium held at Lake Buena Vista, Florida, in 1977 (Greeson, Clark, and Clark 1978), and the definition of visual-cultural or aesthetic values of wetlands was heralded in a U.S. interagency task force report (CEQ 1978) as well as in a book edited by one of the co-authors (Smardon 1983).

Law and policy affecting how wetland land use decisions are made occur at the federal, state, and local levels. Pertinent laws, programs, and policies at all three are briefly reviewed here but only in regard to aes-

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106 Wisc.2d. 7, 201 N.W.2d 761 (1972).
104 2d. 195 (Wash. 1977).
11id.
thetic values. A broader review of such laws and programs is comprehensively treated by Kusler (1978 & 1980).

**Federal Programs Affecting Wetlands**

Community wetland programs are encouraged by a number of federal programs. Two of the best known are the Coastal Zone Management Act of 1972, and the Rivers and Harbors Act of 1899.

1. The Coastal Zone Management Act of 1972. This act applies to all states bordering on the oceans and the Great Lakes. To qualify for federal grants-in-aid for administration of a coastal zone program, a state must adopt land use regulatory and acquisition powers for coastal zone areas and either directly regulate uses or establish standards for local regulation of these uses. The act also authorizes federal grants-in-aid for purchase of estuarine sanctuaries, although these provisions have not been funded. States are required to inventory coastal zone areas of “particular concern.” These have been defined in the administrative guidelines to include wetland areas.

2. Corps of Engineers Permit Procedures. A permit is required from the U.S. Army Corps of Engineers for most fills and dredging of U.S. waters pursuant to the Rivers and Harbors Act of 1899 and the Federal Water Pollution Control Act Amendments of 1972. Under a judicially broadened definition of Army Corps jurisdiction, a permit is required for fills and dredging in lakes larger than five acres, rivers to the point of headwaters (the point at which flow is five cubic feet per second), coastal areas to the high-water mark, and associated wetlands. Permits will not be issued unless proposed uses are consistent with state coastal zone programs and local regulations. These requirements give community wetland protection programs a strong veto power over Army Corps permits.

In addition to the Army Corps general guidelines, the Environmental Protection Agency (EPA) has published “Guidelines for Specification of Disposal Sites for Dredged or Fill Material” under Section 404 of the Water Pollution Control Act Amendments of 1972. Within “Subpart G, Human Use Characteristics of These Guidelines,” the EPA has included sections on recreation, aesthetics, and amenities. These provisions are quoted in full here to show the breadth and depth of concerns included in these regulations:

230.62 Recreation

Recreation encompasses activities undertaken for amusement and relaxation. Water related outdoor recreation requires the use, but not necessarily the consumptive use, of natural aquatic sites and resources, including wetlands.

(a) Values. Much of our outdoor recreation is water-dependent. A host of activities, including fishing, swimming, boating, water skiing, racing, clamming, camping, beachcombing, picnicking, waterfowl hunting, wildlife photography, bird watching and scenic enjoyment, take place on, in, or adjacent to water. In many parts of the country, space and resources for aquatic recreation are in great demand. Water quality is a vital factor in determining the capacity of an area to support the various water oriented outdoor recreation activities.

(b) Possible loss of values. One of the more important
direct impacts of dredged or fill disposal is on aesthetics; more serious impacts impair or destroy the resources which support recreation activities. Among the water quality parameters of importance to recreation that can be impacted by the disposal of dredged or fill material are turbidity, suspended particulates, temperature, dissolved oxygen, dissolved materials, toxic materials, pathogenic organisms, degradation of habitat, and the aesthetic qualities of sight, taste, odor and color. Changes in the levels of these parameters can adversely modify or destroy water use for several or all of the recreation activities enjoyed in any given area. 

(c) Guidelines to minimize impacts. In addition to the consideration of alternatives in 230.10(a), Guidelines to minimize impacts as described in 230.10(d), and to minimize impacts as described in 230.10(d), and water dependency in 230.10(e) and the specific measures described in Subparts E and F, where appropriate, specific measures to minimize impacts on recreational resources include, but are not limited to:

(1) Selecting discharge sites removed from areas of recognized recreational value.

(2) Selecting time periods of discharge that do not coincide with seasons of periods of high recreational use.

(3) Use of procedures and methods as described in 230.31(c) and 230.32(c) to minimize and contain the amounts of suspended particulates and dissolved contaminants, including nutrients, pathogens, and other contaminants released in the water column.

(d) Special determinations. In addition to the determination required by 230.20 and the special determinations required by Subparts E and F, where appropriate, special determinations where recreational areas may be affected by the discharge of dredged or fill material include whether the discharge will:

(1) Change or affect the suitability of an area of high recreational value to provide recreational opportunities.

230.63 Aesthetics
Aesthetics associated with the aquatic ecosystem, including wetlands, consist of the perception of beauty by one or a combination of senses of sight, hearing, touch and smell. Aesthetics of aquatic ecosystems apply to the quality of life enjoyed by the general public as distinct from the value of property realized by owners as a result of access to such systems (see 230.64).

(a) Values. The aesthetic values of aquatic areas are usually the enjoyment and appreciation derived from the natural characteristics of a particular area. Aesthetic values may include such parameters as the visual distinctiveness of the elements present, which may result from prominence, contrasts due to irregularity of form, line, color, and pattern; the diversity of elements present including topographic expression, shoreline complexity, landmarks, vegetative pattern diversity, waterform expression, and wildlife visibility; and the compositional harmony or unity of the overall area. . . .

(b) Possible loss of values. The discharge of dredged or fill material can mar the beauty of natural aquatic ecosystems by degrading the water quality, creating distracting disposal sites, inducing nonconforming developments, encouraging human access, and by destroying vital elements that contribute to the compositional harmony or unity, visual distinctiveness, or diversity of an area.

(c) Guidelines to minimize impacts. In addition to the consideration of alternatives in 230.10(a), Guidelines to minimize impacts as described in 230.10(d), water dependency in 230.10(e), and specific measures described in Subparts E, F, where appropriate, specific measures to minimize impacts on aesthetic values include, but are not limited to:

(1) Selecting discharge sites and following discharge procedures that will prevent or minimize any potential damage to the aesthetically pleasing features of the aquatic site, particularly with respect to water quality.

(2) Following procedures that will restore the disturbed area to its natural condition.

(d) Special determination. In addition to the determinations required by 230.20 and the special determinations required by Subparts E and F, where appropriate, special determinations where aesthetic values in aquatic areas may be affected by the discharge of dredged or fill material include whether the discharge will change or affect the elements of an aquatic or wetland area which contribute to its aesthetic appeal.

230.64 Amenities
Amenities derived from a natural aquatic ecosystem, including wetlands, include any environmental feature, trait, or character that contributes to the attractiveness of real estate, or to the successful operation of a business serving the public on its premises. Aquatic resources which are unowned or publicly owned may provide amenities to privately owned property in the vicinity.

(a) Values. Persons or institutions claiming amenities of the unowned or publically owned aquatic ecosystem have monetary investments in property, a portion of which can be realized only because of the existence of unowned but accessible public amenities. The added property value attributable to natural amenities varies with the quality, use, and accessibility of aquatic and wetland areas.

(b) Possible loss of values. The discharge of dredged or fill material can adversely affect the particular features, traits, or characters of an aquatic area which make it valuable as an amenity to property owners. Dredge or fill activities which degrade water quality, disrupt natural substrata and vegetational characteristics, deny access to the amenities, or result in changes in odor, air quality, or noise levels may reduce the value of an aquatic area as an amenity to private property.
Guidelines to minimize impacts. In addition to the consideration of alternatives in 230.10(a), the Guidelines to minimize impacts as described in 230.10(d), water dependency in 230.10(e), and specific measures described in Subparts E and F, where appropriate, specific measures to minimize impacts on amenities include, but are not limited to:

1. Selecting discharge sites which are of lesser value to nearby property owners as natural aquatic or wetland amenities.

2. Timing the discharge to avoid interference during the seasons or periods when the availability and accessibility of aquatic or wetland amenities are most important.

3. Following discharge procedures that do not disturb features of the aquatic ecosystem which contribute to the value of an aquatic amenity.

Special determination. In addition to the determinations required by 230.20 and the special determinations required by Subparts E and F, where appropriate, special considerations where aquatic amenities may be affected by discharges of dredged or fill material include whether the discharge will change or affect any feature of an aquatic area which contributes to its value as an amenity to property owners.57

Note that EPA has written guidelines treating three distinct classes of visual-cultural values: recreational, aesthetic, and amenities. There are a number of interesting points in the characterization of these values. First, recreational values include those recreational activities that “Take place on, in, or adjacent to water.”28 Thus, the adjacent upland is seen as contributing to the enjoyment of the value. Second, aesthetics includes “perception of beauty by one or more of a combination of senses of sight, hearing, touch and smell.”29 Thus, aesthetics is not limited to the visual only. Note also that the “enjoyment and appreciation [are] derived from the natural characteristics of a particular area.”30 Many of these “characteristics” have been treated in recent work by one of the co-authors (Smardon 1983, Shiyan & Smardon 1990). Third, there is the special treatment of amenities, which, in contrast to values enjoyed by the special public, are “derived from a natural aquatic ecosystem, ... include any environmental feature, trait, or character that contributes to the attractiveness of real estate, or to the successful operation of a business serving the public on its premises.”31 Thus, the economic attributes of aesthetic values through their contribution to property values and operation of certain amenity-dependent businesses are recognized.

In addition to these distinct classes of visual-cultural values, the EPA guideline even specifies a procedure for “site appearance determinations,” which includes photographic documentation of the site in question. The following passage from the EPA guideline specifies procedures for visually documenting site conditions:

230.20

Proposed disposal site appearance determinations. A determination shall be made of the appearance of the proposed disposal site and appropriate parts of its surrounding environment prior to the initiation of discharge activity. Photographic determinations are preferable to narrative descriptions, provided they are accompanied by pertinent data such as exact location of photographer and direction of exposure, time of year and day and weather conditions affecting film exposure, the kind of camera, lens, etc. used, and the photograph clearly depicts those aspects of the aquatic environment and wetlands that will be impacted or modified by the discharge activity. Comment: The appearance of the proposed disposal site and its surroundings prior to any discharge activity is relevant to the findings required in 230.10 and 230.11. Sufficiently detailed information concerning the appearance of the disposal site before discharge occurs will aid in predicting the impact of the discharge, assessing the adequacy of measures to minimize impacts, monitoring compliance with the permit and restoring the site where appropriate.

Special determinations. A determination shall be made of whether the material to be discharged will disrupt any special disposal site characteristics, taking into consideration the resource values, possible loss of these resources, and these guidelines, as well as special determinations described in Subparts E through G of the proposed disposal site.32 The specific procedure in 230.20 was suggested by Smardon to EPA to ensure adequate records of the site before an activity had taken place, and to be used as visual information for assessing the adequacy of mitigation procedures and whether they had taken place.

State Programs Affecting Wetlands
State programs pertaining to wetlands include coastal wetland acts, inland wetland acts, critical area acts, coastal management acts, navigable water acts, shoreline and lake management acts, open-space acts, and landuse planning acts.
Specific state statutes that mention the aesthetic enjoyment or scenic value of wetlands, or the preservation of the natural landscape character include coastal wetland acts for Delaware, Maryland, New York, Rhode Island, and Virginia; inland wetland and navigable waterways acts for New Hampshire, Vermont, and Wisconsin; critical area legislation for Alabama, Arkansas, Minnesota, and Virginia; coastal management acts for New Jersey, Rhode Island, and Texas; shoreline and lake management acts for Maine, Michigan, and Washington; an open-space act for Pennsylvania; and a land use planning act for Vermont.

Specific state statutes that mention recreational values or enjoyment include coastal wetland acts for Delaware, Mississippi, and New Jersey; an inland lakes act in Michigan; and a freshwater wetland and coastal management act for Rhode Island. The critical area acts for Minnesota and Alabama include cultural and historical values of wetlands. New York state's Tidal Wetlands Act is the most comprehensive, including educational and research values of wetlands as well as recreational and aesthetic values.

**Local Regulation of Wetlands**

Local regulation of wetland activities is authorized by state wetland protection acts in Virginia, Massachusetts, Connecticut, and New York. The Wisconsin and Washington shoreland zoning programs and the Florida critical area program, which has been interpreted to apply to Big Cypress and Green swamps, also require local controls. More than 1,000 local communities in these states have adopted wetland protection regulations (Kusler 1980). A larger number of other communities have adopted land use regulations for wetland areas pursuant to coastal zone or flood plain regulatory efforts, or to broader land use zoning or subdivision control programs.

As noted earlier, local adoption of wetland regulations has been encouraged not only by state wetland acts, but also by the National Flood Insurance Program, which requires local regulation of the 100-year frequency flood plain (area flooded by a 100 year frequency storm) area in order to qualify for federally subsidized flood insurance. More than 14,000 communities have adopted or indicated an intent to adopt flood plain regulations in order to qualify for this program. Other federal incentives to promote wetland protection by localities include the Coastal Zone Management Act of 1972 and the U.S. Army Corps of Engineers section 404 permit requirements.

Strong local incentives also exist for the regulation of wetland areas. These incentives include the achieving such common land and water use planning objectives as reasonable minimization of natural hazards, provision for open space and recreation areas, prevention of septic tanks in unsuitable areas, allocation of lands throughout a community to their most appropriate uses, and protection of water supplies. However, sufficient funds are rarely available at the local level to

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53Coastal Wetlands, Del. Code Title 7 s. 6602.
55Tidal Wetlands, N.Y.S. Env. Cons. Law Title 46, Ch. 23, s. 25-0101.
56Coastal Wetlands, R.I. Gen. Law Title 46, Ch. 23, s. 1.
61Coastal Areas, Ala. Code Title 9, s. 2.
66Coastal Wetlands, R.I. Gen. Laws Title 46, Ch. 23, ss. 1.
68Shorelands, Maine Rev. Stat., Title 12, s. 4811.
70Shoreline Areas, Rev. Code Wash., Ann Title 90.58.
73Coastal Zone, Del. Code Title 7 s. 7004.
74Coastal Wetlands, Miss. Code Ann. Ch. 49, ss. 27-1.
77R.I. Gen. Laws, s. 21-1-13 et seq. and ss. 46-23-1 to 46-23-16.
79State Critical Area, Ala. Code Title 9 ch. 9 ss. 1.
80Tidal Wetlands, N.Y.S. Env. Cons. Law ss. 25-0101.
purchase more than a small portion of community wetlands to serve these objectives. In addition, it is often politically unacceptable to remove large tracts of land from the tax rolls and from economically preferable uses. For this reason, several types of land use regulation have been commonly adopted to restrict land uses that have the most severe impact on wetlands while permitting continued private use of lands.

**Regulatory Approaches and Techniques**

The two main regulatory approaches applied to wetland areas are: (1) complete prohibition of all fills, dredging, and structural uses; and (2) application of performance standards to uses that reduce flood losses, reduce impact upon wildlife, and serve a wide range of other objectives. The second approach is more common, although a considerable number of communities have adopted restrictive controls. Explicit wetland protection provisions are typically incorporated in several types of local regulations:

1. **Local wetland zoning regulations.** These are the most common kinds of wetland protections and are adopted as a primary or overlay zone within a broader comprehensive zoning ordinance or, alternatively, as a separate wetland ordinance. The regulations may be based upon a special wetland regulatory statute; a coastal zone, shoreland, or scenic and wild river statute; or a broader zoning authority. Zoning regulations consist of a map showing wetland boundaries as well as a text listing prohibited and permitted uses and establishing general standards for special permit uses. Usually a zoning board of adjustment, planning board, or special board (e.g., a conservation commission) is authorized to evaluate applications for special permits within wetland areas.

2. **Special wetland protection bylaws or ordinances.** These may be adopted pursuant to special wetland protection statutes (e.g., a Massachusetts statute authorizes local units of government to regulate directly or comment upon wetland uses), or to statutes authorizing local control of grading and filling, tree cutting, and other activities; or they may be included within the home rule powers of the municipality. Typically, they contain a text setting forth prohibited, permitted, and special uses. Wetlands may be defined by description or with a map reference.

In addition to these two principal types of wetland regulations, control of wetland development may be achieved through several other types of special and general ordinances and bylaws. Rarely do any of these measures include specific provisions for consideration of aesthetic or heritage values.

**Critical Wetland Court Cases**

What is most interesting and significant in the implementation of local government wetland regulation is the number of court cases that have generated disputes about appropriate decision-making by local units of government. These court cases have gone in two distinct directions.

One direction is a conservative environmental attitude. In wetland regulation cases, the courts found landowners who were deprived of their property rights by local government bodies when they tried to restrict uses of the wetlands. Such was the basic attitude in the cases of *Turnpike Realty Co. v. Town of Dedham*\(^{61}\) in Massachusetts, *Dooley v. Town Planning and Zoning Comm'n*\(^{62}\) in Connecticut and *State of Maine v. R. B. Johnson*\(^{63}\). In these older cases, the courts tended to diminish the importance of the natural functions of wetlands; they stressed the individual property rights of wetland owners or questioned procedural practices of local wetland regulation bodies in their respective actions. This attitude seems to be receding.

On the other hand, there is the liberal environmental attitude. The decisions in these cases advance the protection of wetlands based on the public trust doctrine; that is, certain lands like wetlands, beaches, shorelands, and river bottoms are held in trust by the state for the benefit of the public. Other cases use a theory based on the prevention of public harm, or nuisance theory, that supports the protection of wetlands. These cases are characterized by *Rowe v. Town of North Hampton Commission*\(^{64}\), *Just v. Marinette County*\(^{65}\), and *Carter v. South Carolina Coastal Council*\(^{66}\).

*Just v. Marinette County* in Wisconsin is the most interesting of the three in that it articulates both approaches. First, the court states the context for the case and notes the changing sense of value of wetlands in general:

This case causes us to re-examine the concepts of public benefit in contrast to public harm and the scope of an owner's right to use of his property. In the instant case we have a restriction on use of a citizen's property, not to

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\(^{62}\) 151 Conn. 304, 197 A.2d 770 (1964).
\(^{64}\) 555 A.2d 1331 (N.H. 1989).
\(^{65}\) 56 Wis.2d 7 201 N.W.2d 761, (1972).
\(^{66}\) 314 S.E.2d 327 (S.C. 1984).
secure a benefit from the public, but to prevent a harm from the change in the natural character of the citizen’s property. . . . What makes this case different from most condemnation or police power zoning cases is the relationship of the wetlands, the swamps and the natural environment of shorelands to the purity of water and to such natural resources as navigation, fishing, and to scenic beauty. Swamps and wetlands were once considered wasteland, undesirable, and not picturesque; but as the people became more sophisticated, an appreciation was acquired that swamps and wetlands serve a vital role in nature, are part of the balance of nature and are essential to the purity of water in our lakes and streams. Swamps and wetlands are a necessary part of the ecological creation and now, even to the uninitiated, possess their own beauty in nature.67

Next, the court states the owner’s rights and what is and is not a reasonable use of the area in question:

An owner of land has no absolute and unlimited right to change the essential natural character of his land so as to use it for a purpose for which it was unsuited in its natural state and which injures the rights of others.

The exercise of the police power in zoning must be reasonable and we think it is not an unreasonable exercise of that police power to prevent harm to public right by limiting the use of private property to its natural use.68

The court continues:

The changing of wetlands and swamps to the damage of the general public by upsetting the natural environment and the natural relationship is not a reasonable use of the land that is protected from police power regulation.69

The court acknowledges the precedence of its decision, but it presents a balancing test to weigh the interests in any given situation.

We realize no case in Wisconsin has yet dealt with shoreland regulations and there are several cases in other states which seem to hold such regulations unconstitutional; but nothing this court has said or held in prior cases indicates that destroying the natural character of a swamp or a wetland so as to make that location available for human habitation is a reasonable use of that land when the new use, although of a more economical value to the owner, causes harm to the general public.70

The balancing test is to weigh the magnitude of the personal economic loss to the particular landowner against the magnitude of the harm to the general public, which is usually the infringement or elimination of the natural functions and character of the wetlands. Finally, the court cites the case of Muench v. Public Service Commission71 in Wisconsin in articulating the public trust mandate for the state and in including protection of recreation and scenic beauty in that mandate.

The active public trust duty of the State of Wisconsin in respect to navigable waters requires the state not only to promote navigation, but also protect those waters for fishing, recreation and scenic beauty.72

Following Just v. Marinette County, courts in Florida,73 South Carolina,74 New Hampshire,75 and North Carolina76 have approved of the natural use theory (as termed by Hunter 1988), with New Hampshire contributing most of the doctrine, beginning with Sisson v. State77 and progressing to State of New Hampshire Wetlands Board v. Marshall.78

It seems inevitable that the liberal environmental view of decision-making concerning the fate of U.S. wetlands and other sensitive areas will prevail. Just as zoning upheld merely on aesthetic considerations has gradually been accepted in most states, so will aesthetic considerations in wetland management.

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67 Just v. Marinette County, 56 Wis.2d 7, 10, 201 N.W.2d 761, 767-68 (1972).
68 Id. at 11, 12, 201 N.W.2d at 768.
69 Id. at 13, 201 N.W.2d at 769.
70 Id.
71 65 N.W.2d. 40 (Wis 1955).
72 Just v. Marinette County, 201 N.W.2d. 761, 768 (1972).
Hillside Protection

Several communities have special provisions for hillside preservation either for scenic view protection (Figure 10.6), as mentioned in Chapter 8, or for environmental hazard protection from steep slopes and excessive water runoff and erosion. The prominent examples include the cities of Cincinnatia and Scottsdale, Arizona. As we have seen, the legal problems with restricting all use of hillsides can result in a taking as illustrated by the Corrigan v. Arizona case. Many of the same legal treatments and issues that apply to hillside protection ordinances apply to wetlands. The difference is that the multifunctional values of wetlands have been well established, whereas hillsides have a more limited set of functions. Also, the economic incentive of spectacular views is still a very strong incentive to develop such hillsides throughout the country. This very probably will be one of the next major battlegrounds for aesthetic resource regulation and protection.

RESOURCE-SPECIFIC LEGISLATION AND PROGRAMS

Some programs and legislation are resource-specific rather than activity-specific. This discussion addresses laws and programs of maintenance or preservation of aesthetic values connected with air quality, water quality and quantity, archeological resources, and wildlife resources.

Air Quality

Although there is federal legislation dealing with air quality with attendant federal and state regulations, there is no clearer articulation of aesthetic values (see Figure 10.7) related to air quality than Section 128 of the Clean Air Act Amendments of 1977, Public Law 95-95, enacted August 7, 1977. This act declares as a national goal the prevention of visibility impairment from manmade air pollution and the restoration of nat-
ural visibility in mandatory Class I federal areas. Analysis of the legislative history of the visibility protection provision shows that Congress was primarily concerned with preserving "grand vistas" and "breathtaking panoramas" for the enjoyment of the public visiting mandatory Class I federal areas possessing such values. The criteria used in the Federal Register to identify areas where visibility is an important value are:

1. Does the legislation for the area indicate that scenic value was an important consideration for establishing the area? or Is the area possessed of scenic values that are important to public enjoyment?
2. Are scenic values of the area primarily in the form of panoramas, background, intermediate or foreground views?
3. Do natural sources of visibility impairment seriously affect the ability of the public to appreciate visibility as an important value?

4. For those areas in which natural resources of visibility impairment seriously affect public appreciation of scenic values, is the magnitude of scenic value sufficient to warrant protection from man-caused sources?

Class I federal areas are mainly wilderness areas, national parks, and national memorial parks, but they also include national primitive areas and national wildlife refuges. According to a staff person in the National Park Service involved with the act's regulations: (1) legislative intent or purpose in the Act's establishing the areas, (2) proof of public values related to visibility at the areas, and (3) a statement of management citing visibility as an important attribute were all important criteria used to identify these areas.

Key problems in implementing this act, as pointed out by a National Park Service staff member, are: (1) how to measure visibility, which is a subjective judg-

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\(^{43}\) Id. at 552281.
ment; (2) what is "impairment" of air quality; and (3) who is responsible for the impairment. There has been some research done on perceptions of air quality and how much people value clear and expansive views sponsored by the U.S. Environmental Protection Agency (1979).

The Clean Air Act Amendments of 1977 provide two directives to the Environmental Protection Agency (EPA) and federal land managers:

1. A directive to federal land managers (primarily the secretaries of Interior and Agriculture) that they have an affirmative duty to protect the air quality values (including visibility) of Class I areas from impairment due to emissions from new sources; and a further directive to identify those mandatory Class I areas where visibility is an important value, and where additional measures may be needed in order to prevent its impairment or to correct existing impairment.

2. A directive to the EPA to protect air-quality-related values in its prevention of significant deterioration (PSD) regulations, and to develop a program to protect the visibility in and around mandatory Federal class I areas.

Regarding the second area, the EPA was supposed to promulgate PSD regulations for other criteria (important) pollutants, besides establishing increments (allowable levels) for particulates and sulfur dioxide. Applicants for new source permits must show that Class I increments will be met, but it is the duty of the federal land managers to investigate whether air-quality-related values would be adversely affected.

One mechanism for doing this is the preconstruction review process, which includes requirements that air-quality-related values apply to federal lands in all Class I areas, not just mandatory federal Class I lands. In contrast, Section 169A on visibility protection is limited to federal mandatory Class I areas only.

Following the EPA's identification of a final list of mandatory Class I federal lands, it was to promulgate regulations within two years for the revision of Standard Implementation Procedures. These regulations are to include the requirement that each major stationary source existing at the time of enactment of the Clean Air Act Amendments, and not more than fifteen years old, is to install the best available retrofit technology (BART) as expeditiously as practicable. EPA regulations are also to include a "long-term" (ten-to-fifteen-year) strategy for making reasonable progress toward meeting national goals of remediating any existing impairment of visibility in a mandatory Class I federal area. The EPA published proposed PSD regulations in November 1977 and issued final regulations promulgating implementation plans in early June 1978.

No source has yet been affected by the BART requirement, since the EPA and the states have been unable to link any particular existing source to visibility impairment (Oren 1989). Much of the program has been criticized, for instance, shortcomings of the increments as site-shifting devices as they relate to nondegradation, overly restricting the scope of Class I protection, and ad hoc development of the PSD program (Oren 1989). The PSD program, in fact, was in response to a lawsuit, Sierra Club v. Ruckelshaus, that was initiated by the Sierra Club to move EPA toward program development at a quicker pace.

Oren (1989) and others maintain that a partial solution to these problems are contained in the AQVR ("air-quality-related values") test. Section 165(d)(2)(C) of the Clean Air Act Amendments provides that Class I increments are not absolute but merely determine who has the burden of proof on whether a source could be built. If the Class I increments would be violated, then a source may build if the applicant shows that the source would not affect the AQVR of the area. A source could be prevented from building even if the Class I increments would not be violated, if the federal land manager shows a "potential adverse impact" on the Class I areas. In practice, the AQVR test has proven to be of little importance. No source has ever been denied a permit under the AQVR test.

Sections 110(a)(2)(J) and 161 of the amendments do not merely obligate states to include the specific provisions of the PSD program in their state implementation plans but also give the EPA the authority to impose further requirements in the name of preventing significant deterioration. In Alabama Power v. Castle, the leading judicial interpretation of the PSD provisions of the act, lends some support to this view. The court held that Section 161 gave the EPA the authority to establish rules to abate interstate pollution in clean air areas but refused to allow EPA to go beyond that letter of the statute.

Much of research on perception of air quality was done in the Southwest since one of the largest and most controversial projects proposed for that area, the so-called Four Corners (Figure 10.8), or Kaiparowits, Power Complex, concerned air quality. Three environ-
mental cases were related to various aspects of the gigantic power complex under development. Ten electric companies proposed to construct a network of six coal-fired electric generating stations in the Four Corners area of Utah, New Mexico, Arizona, and Nevada that would ultimately produce as much as 13,000 megawatts, about as much power as the entire output of the Tennessee Valley Authority. Virtually none of the power was to be used in the region, but was to be shipped to distant load centers such as Los Angeles, San Diego, Las Vegas, Phoenix, and Tucson. The coal for four of the six plants would come from underground mines. Altogether, the plants would burn about 144,000 tons of coal a day. Cooling water would be drawn from the Colorado River at the rate of 250,000 acre-feet (about 80 billion gallons) per year, more than twice the annual consumption of the entire city of San Francisco. Estimates of the air pollution associated with the power complex were staggering, over 200 tons of particulates, 1,350 tons of sulfur oxides, and 1,000 tons of nitrogen oxides would be produced every day—more than Los Angeles, the nation’s smog capital.

The situation is even more appalling when one considers that the Four Corners region is one of the last areas of relatively clean air left in the country. It contains some of the most prized scenic, recreational and cultural treasures: the Grand Canyon, Mesa Verde, Zion, Bryce Canyon, Lakes Mead and Powell and Canyon de Chelly. (Brecher 1972)

In this area, too, lived some of the last groups of Native Americans who had succeeded in maintaining traditional ways of life against the relentless pressures toward assimilation presented by modern American technology. Besides the conflict with Native American value systems, the authors wish to draw attention to the direct conflict over scenic area air quality degradation. The Kaiparowits Power Complex has been built with attendant air quality degradation.

In addition to the Kaiparowits Power Complex, another group of Southern California, Nevada, and Utah municipally owned utilities are drawing up engineering plans for another mammoth coal-burning plant, this one to be situated only ten miles from Capitol Reef National Park in southeast Utah (Conservation News 1978).

The location of the proposed Intermountain Power Project (IPP) is not the only similarity to Kaiparowits. The capacity of plant would be about the same—13,000 megawatts, the largest coal-fired plant in the world; it would cost as much as $4 billion; it would emit about the same amount of pollutants; it would require about the same amounts of coal and water; and its social impacts would likely have the same boom-and-bust syndrome effect on a sparsely settled rural region. Predictably, it raises many of the same issues as Kaiparowits.

IPP was initiated after the U.S. Bureau of Reclamation stopped development of additional power supplies from the Colorado River Storage Project for a group of Utah and Nevada utilities, the Intermountain Consumers Power Association. Deciding it would be cheaper to produce their own power than to turn to the region’s predominant private utility, Utah Power and Light, the small municipal utilities joined influential Los Angeles Power and Water Department and undertook an engineering feasibility study of a site in southern Utah.

A critical factor, water was available from two major sources, the Escalante and Fremont rivers. At both sites, IPP would have to build its own reservoir and drill wells. But, most importantly, it would not have to buy any water rights. The plant would be downwind from the park, and the two 700-foot-high stacks would be hidden from view behind a bluff. But the plant would need a variance to the requirements of the Clean Air Act and would run straight into the PSD air quality provision and the specifications of Section 128 of the Clean Air Act Amendments of 1977, mentioned earlier. Capitol Reef National Park, which IPP would be near, is a federal Class I area designated under provision of Clean Air Act Section 162(a). The final decision under the AQTV test regarding a source violating the

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increments rests with the federal land manager. This is because it emerged from a congressional conference as a limited concession to the developers of the proposed Intermountain Power Project.

Capital Reef National Park is mountainous, and the emissions from the plant would at times be blown directly into the mountains. Air quality modeling showed that there would be violations on some days even with strict emission controls. As enacted, the AQRV provision allows the state’s governor to permit the Class I short-term increments to be exceeded at high altitudes up to eighteen days per year. Thus, any federal land manager has the power to override the state and reject issuance of a permit under the AQRV test.

According to Oren (1989), Congress, in drafting the Clean Air Act Amendments, failed to give either EPA or the federal land manager the unambiguous responsibility or authority to protect air quality in Class I areas. Congress also failed to give the federal courts appropriate authority. In one case, United States v. Atlantic Richfield, the district court held that a nuisance suit by the government against a large source of fluorides near Glacier National Park should be decided on the basis of federal common law. The establishment of PSD has not only failed to provide substantive criteria for park protection but has prevented the federal courts from doing so. Instead, under the Supreme Court’s decision in Ouellette v. International Paper, any nuisance action would be resolved on the basis of the law of the state in which the source is located, even if the source is located across state boundaries from the place of injury. In effect, then, the source state would be able to define through its substantive law the scope of any obligation to protect a national park’s air quality.

EPA regulations implementing the other major section of the amendments, Section 169A, also give states carte blanche to decide whether a new source affecting national park visibility should be allowed. For a source whose effects come from “nonattainment” emissions, or which affects an “integral vista,” the state may decide that its own economic development is more important than protecting the view looking into or looking out of a Class I area. While the state must consider the federal land manager’s analysis, it is in the state’s control to decide whether the source will have an adverse impact on visibility. The departments of Agriculture and Interior have declined to designate “integral vistas,” effectively eviscerating that portion of the program. EPA has confined the application of Section 169A to states that contain mandatory Class I areas in which visibility has been identified as an important value rather than encompass states with sources that might contribute to visibility degradation in the identified areas. Even if the vistas were to be designated, EPA regulations would give them little protection against new sources. EPA rules allow states to determine whether the vista should be protected by comparing the costs of compliance and other factors against park protection. Since integral vistas are views looking out from a park, their protection involves the regulation of sources whose impacts fall outside the parks. The scope of the visibility program seems to focus on reaching only new sources affecting visibility within a park in Class I areas.

Water Quality

There are some legal tools available to maintain certain levels of water quality and quantity. The federal government is also being urged to use, and appears to have adopted a policy of using, its general contract powers as a means of air and water pollution control, and to conserve aesthetic values. Edward Weinberg states that as early as 1937 the Interior Department began to take positive steps to control water pollution. He notes that the Bonneville Project Act, adopted in 1937, contemplated that contracts for the sale of power would contain a provision that would assist in maintaining the water quality of the Columbia River and the aesthetic beauty of the Columbia River Gorge. Accordingly, from the inception, the Bonneville Project Act contracts carried an article that provided for the conservation of natural resources:

The Government will not be obligated to deliver power pursuant to this contract, whenever, in the judgment of the Administrator, the purchaser’s plans or operations would harm or detract from the scenic beauties of the Columbia River Gorge, or the waste products from such plants or operations would harm or destroy the fish or other aquatic life or otherwise pollute the waters of drainage basins of the Pacific Northwest (16 U.S.C. § 832 et. seq.; (1988)).

The main piece of federal legislation affecting water quality, and thus aesthetic water quality, are the federal Water Pollution Control Act Amendments of 1972. This act requires the EPA administrator to

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publish criteria for water quality accurately reflecting the latest scientific knowledge on the kind and extent of all identifiable effects on health and welfare that may be expected from the presence of pollutants in the water. Proposed water quality criteria, including aesthetic criteria, were developed by EPA and notice of their availability was published on October 26, 1973 (38 FR 29646). These criteria were again revised in 1976 in an EPA report entitled “Quality Criteria for Water” (U.S. EPA 1976). The criteria for aesthetic water qualities (Figure 10.9) are:

- All waters free from substances attributable to wastewater or other discharges that:

  (1) settle to form objectionable deposits;
  (2) float as debris, scum, oil, or other matter to form nuisances;
  (3) produce objectionable color, odor, taste and turbidity;
  (4) injure or are toxic or produce adverse physiological responses in humans, animals and plants; and
  (5) produce undesirable or nuisance aquatic life (U.S. EPA 1976, p. 10).

The rationale for these criteria from the 1976 report are as follows:

Aesthetic qualities of water address the general principles laid down in common law. They embody the beauty and quality of water and their concepts may vary within the minds of individuals encountering the waterway. A rationale for these qualities cannot be developed with quantifying definitions; however, decisions concerning such quality factors can portray the best in the public interest.

Aesthetic qualities provide the general rule to protect water against environmental insults; they provide minimal freedom requirements from pollution; they are essential properties to protect the nation’s waterways.” (U.S. EPA 1976, p. 10).

Actually these criteria are very similar to those developed by the National Federal Advisory Committee in their “Water Quality Criteria” report to the Secretary of the Interior (NTAC 1968). The requirements for aesthetics as suggested by the committee were:

A. General Requirements
   I. All surface waters should be capable of supporting life forms of aesthetic value.
   II. Surface waters should be free of substances attributable to discharges of wastes as follows:
      (a) Materials that will settle to form objectionable deposits.
      (b) Floating debris, oil, scum, and other matter.
      (c) Substances producing objectionable color, odor, taste and turbidity.
      (d) Materials including radionuclides, in concentrations or combinations which are toxic or which produce undesirable physiological responses in human, fish, and other animal life and plants.
      (e) Substances and conditions or combinations thereof in concentrations which produce undesirable aquatic life.

B. Desirable Additional Requirements
   I. The positive aesthetic values of water should be attained through continuous enhancement of water quality.
   II. The aesthetic values of unique or outstanding water should be recognized and protected by development of appropriate criteria for each individual case (NTAC 1968, p. 3).

The criteria are substantially the same with the exceptions of parts A.I, B.I, and B.II added to the NTAC report. Criterion A.I was the committee’s acknowledgement of the linkage of water quality to wildlife (NTAC 1968, p. 5), a linkage that has since been given little recognition or attention. Criterion B.I was probably an overly optimistic and visionary goal of enhancement as contrasted to maintenance of the status quo and a recognition of the need for positive steps to be made to improve water quality for aesthetic consumption as well as ecological rationales (NTAC 1968, p. 6). Criterion B.II recognizes that certain bodies of water in the U.S. merit special consideration, such as Lake Tahoe, Crater Lake, portions of Biscayne Bay, and other coastal and estuarine areas, wild and scenic rivers, reservoirs, and lakes — “waters which by reason of clarity, color, scenic setting, or other characteristics provide aesthetic values of unique or special interest.” (NTAC 1968, p. 6).

Certainly the standards of 1968 and their rationale are somewhat richer and more stimulating than the 1976 EPA standards. The 1968 committee also realized that aesthetic water quality standards were contextu-
The Subcommittee wishes to emphasize that aesthetic qualities—noticeably color and clarity—of natural waters vary sharply among regions and within regions or even on specific streams, lakes, reservoirs, bays, and estuaries. The recommended criteria are intended to be applied in the context of natural conditions (NTAC 1968, p. 6).

So again we find the need to use a contextual standard for aesthetic conditions that is sensitive to local conditions. The contextual concept seems to have been lost in the muddle of hurrying to meet quantitative water quality standards based primarily on health and biological indicators at the federal and state levels.

Research has been conducted on how people perceive water quality (Coughlin 1976). There is also a good aesthetic overview of the role of water in the landscape; it was originally prepared by Litton et al. (1974) for the National Water Commission.

**Water Quantity**

There are also some legal tools that may affect the flow, or quantity, of water for aesthetic purposes, especially during low-flow periods in Western states. These tools lie in the area of water rights and more specifically in the “reserved rights” doctrine. This doctrine holds that land owners do not have riparian rights but have appropriation water rights. Briefly, the doctrine states that upon the creation of a federal reservation on the public domain—whether by treaty, legislation, or executive order—the reservation has appurtenant to it the right to divert as much water from streams within or bordering upon it as necessary to serve the purposes for which the reservation was created. In *Arizona v. California*, reserved water rights were decreed for Indian reservations, national recreation areas, national wildlife refuges, and national forests.

As Meyers (1966, pp. 65–66) points out, several aspects of the reserved rights doctrine have significant, operative consequences:

1. The priority date is the date the reservation is created. State-created water rights in existence before this date are superior; those arising thereafter are subordinate.

2. The reserved right, unlike state-created appropriative rights, does not depend upon diversion from the stream and application to beneficial use. The reserved right arises when the reservation is established even though the water right is not exercised for decades thereafter. In this respect the right is like a riparian right. In time of shortage, however, it is unlike a riparian right, for it does not share the available supply pro rata but rather takes its place on the priority schedule and receives water ahead of all rights of later date.

3. As may be inferred from the above statement, the federal reserved right need not be created or exercised in accordance with state law. Not only does its creation not depend on diversion of water and application of it for beneficial use, but the right does not depend upon filing with the state agency or upon recording of the claim. And it is not subject to state laws on forfeiture and abandonment.

4. The quantity of water to be enjoyed under a reserved right is measured by the quantity necessary to fulfill the purposes of the reservation, both at the present time and in the future.

This reserved rights doctrine is extremely complex when federal versus state priority of water rights is considered, or when the doctrine is mixed with riparian and/or prior appropriation water rights system. Meyers points out that “only if the doctrine (reserved rights) is limited to Desert Land Act states and to streams subject exclusively to the law of prior appropriation is a coherent system of law on reserved rights achieved.” (1966, p. 69).

In one of the most important water law cases in the West, *Arizona v. California*, the decree reserved water rights for the Lake Mead National Recreation Area, the Hvasau Lake and Imperial National Wildlife Refuge on the main stream of the Colorado River and the Gila National Forest on a tributary, besides Indian reservation water rights. No differences were seen in principle between reserving water for Indian reservations and reserving water for other federal reservations. Meyers points out that no guidance was given as to the amount of water that is to be withdrawn. What is an acceptable standard for national forests, parks, recreation areas, and wildlife refuges? The only standard given was “a quantity reasonably needed . . . for appropriate purposes.”

Meyers poses the problem that what may be an adequate or minimally reasonable amount for a national forest today may be an extremely large amount for a forest turned recreation area in the future. This may create uncertainty and may cloud potential dealings with private water rights.

Hammond proposes that the reserved rights doctrine be used to control mining operations in wilderness areas by allowing any such appropriation of waters in

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*See U.S. 340, 350 (1963) C.
*Id. at 295.
streams passing through the wilderness area that is compatible with a low level of stream pollution and a reasonable consumption of water. He uses Federal Power Commission v. Oregon,\textsuperscript{98} or the Pelton Dam case to assert that federal control is preeminent over any water located in the boundaries of federal reservations, and that the need of the reservation (Glacier Peak Wilderness Area) is preservation of wilderness (Hammond 1968). Outside of wilderness areas or other areas with specifically designated protective statutes, the reserved rights doctrine may not do much to protect or reserve water flow for aesthetic purposes.

In 1978 the U.S. Supreme Court, in United States v. New Mexico,\textsuperscript{100} affirmed the decision of the New Mexico State Supreme Court concerning water claims by the Forest Service in the Rob Mimbres Adjudication. The question before the Court concerned the original purposes for establishing forest reserves. The Supreme Court ruled, in application of the Reserved Water Doctrine, that the Organic Act of 1897 established two purposes for creating forest preserves: (1) to secure a favorable condition of water flow, and (2) to furnish a continuous supply of timber.

According to the Supreme Court, water claims for management of aesthetics, recreation, wildlife, fisheries, or livestock are not legitimate claims under the reservation doctrine. In the Court’s opinion, the Multiple-Use Sustained Yield Act of 1960 does not modify the purposes of forest preserves to include these claims even with a 1960 priority date. The court stated that although the Multiple-Use Act broadened the purposes of administering the national forests, Congress did not expand reserved rights to the U.S. Forest Service. The implications of this decision include: formidable barriers to claimed reserved rights arising by implied intent, and possible problems for federal land management agencies such as the Forest Service and BLM. The problems would be less for the National Park Service because of the specific authorization legislation existing for each national park and monument. The Court denied claimed reserved rights by reading a narrow construction of original legislation for the Gila National Forest and further specified that:

1. The right must relate to the original purpose of the withdrawal of the reservation;
2. The implication must be necessary to prevent the frustration of the original purpose of the reservation; and
3. The distinction between primary and secondary purposes of reservations, stating that the court will find a reserved right to effect the former but will draw the contrary inference for the latter.\textsuperscript{101}

In 1979 the U.S. solicitor general attempted an end run around New Mexico by issuing an opinion that made extensive federal reserved and on-reserved claims but which was repudiated by a subsequent solicitor general opinion. However, case law on parks and related reservations seems to be developing consistent with the 1979 opinion (Solicitor General 1979). A federal district court in Colorado\textsuperscript{103} held that the protection of in-stream flows in wilderness areas, as opposed to multiple-use forest lands, is a primary purpose of the Wilderness Act of 1964 and applies equally to National Park Service areas. The Colorado Supreme Court recognized reserved rights for the benefits of the Rocky Mountain National Park for the protection of watershed and timber resources and the conservation of scenery, historic, and scientific objects and wildlife.\textsuperscript{102} The court, however, applied the primary-secondary distinction and refused to recognize in-stream flows to support recreational boating in the Dinosaur National Monument. Many legal scholars are advocating that it is the public land managers responsibility to protect in-stream flows and water rights just as they should protect air quality of parks, wilderness areas, and national monuments (Leshy 1988; Marks 1987; Reynolds 1989; Sherston 1981; Tarlock 1986; and Vassallo 1986).

Another interesting situation is the Mono Lake controversy in California that also involves water rights issues. Los Angeles diverts four of five streams feeding Mono Lake for the Los Angeles area water supply. Preservationists maintain that diminishing water levels of Mono Lake affects the hydrology and ecology of the lake as well as causing aesthetic impact. After numerous lawsuits and political battles the city of Los Angeles agreed in September 1989 to surrender some of its water rights in order to reduce environmental damage. In fact, EDFA, an environmental planning firm, was retained to assess whether people could perceive changes in water level on the shore edges of Mono Lake over time. This was linked to an English water law concept of gradual versus sudden changes in water courses and bodies. The visual simulations of changed water levels and the accompanying testimony were some of the most powerful evidence submitted supporting the ecological and aesthetic impact of lowered water levels of Mono Lake (see Figure 10.10). The key court case in-

\textsuperscript{98}349 U.S. 435 (1955).
\textsuperscript{101}Sierra Club v. City and County of Denver 656 P.2d 1 (Colo. 1982).
Figure 10.10 a, b, c, d, e, f (pages 170–171) Mono Lake study of perceived change of water levels. Photo credit: EDAW Inc., San Francisco
volved with this dispute, *National Audubon Society v. Superior Court*, was truly precedent-setting as no court had previously held that public trust doctrine affected riparian or appropriate water rights; the case expanded such rights to any public use associated with navigable waters to include recreation and aesthetics (Casey 1984; Conway 1984; Stevens 1989; and Walston 1987).

**Archeological Resources**

Federal acts that provide for protection of archeological resources are the Antiquities Act of 1906 and the Historical and Archeological Data Preservation Act of 1974. The Antiquities Act provides for the protection of historic and prehistoric remains or "any object of antiquity" on federal lands; establishes criminal sanctions for unauthorized destruction or appropriation of antiquities; authorizes presidential proclamation of national monuments; and authorizes the scientific investigation of antiquities on federal property, subject to permit and regulation. The Historical and Archeological Data Preservation Act of 1974 amended the Reservoir Salvage Act of 1960 to broaden the scope of the earlier act. It authorizes the temporary delay of any federally financed construction project or federally licensed activity or program while publicly financed recovery, protection, and preservation of historical and archeological resources, including relics and specimens, is undertaken. Many projects have been delayed due to archeological salvage activities under this provision.

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Tying many historical and archeological provisions together is Executive Order 11593, “Protection and Enhancement of the Cultural Environment.” This executive order stated that it would be the policy of the federal government “to provide leadership in preserving, restoring, and maintaining the historic and cultural environment of the Nation.” The order added that federal agencies shall “administer the cultural properties under their control in a spirit of stewardship and trusteeship for future generations,” and institute procedures to carry out these goals.

Wildlife Resources

Wildlife is not often thought of as an aesthetic or visual resource, but often wildlife, especially large mammals (Figure 10.11), will tend to dominate the landscape or seascape and “steal the show.” Although ephemeral, wildlife is a major part of rural natural and wilderness landscapes as well as one of the main reasons for recreational activities in the landscape such as nature watching, and photography. Wildlife biologists refer to such values as the nonconsumptive values of wildlife. There has been little perceptual research on aesthetic values of wildlife.

Although wildlife usually belong to the states in which they are found, and state wildlife agencies are primarily responsible for their management and protection, there are a few key federal statutes that call attention to the aesthetic aspects of wildlife and their habitat. These are the Endangered Species Act of 1973 and the Marine Mammal Protection Act of 1972. The purpose of the Endangered Species Act is stated as: “to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, (and) to provide a program for the conservation of such species and threatened species” Section 1531 of the act declares: “—(3) these species of fish, wildlife, and plants are of esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people.” (Emphasis added.)

Section 2 (6) of the Marine Mammal Protection Act states that:

(6) marine mammals have proven themselves to be resources of great international significance, esthetic and

recreational as well as economic, and it is the sense of the Congress that they should be protected and encouraged to develop to the greatest extent feasible commensurate with sound policies of resource management and that the primary objective of their management should be to maintain the health and stability of the marine ecosystems. Whenever consistent with this primary objective, it should be the goal to obtain an optimum sustainable population keeping in mind the optimum carrying capacity of the habitat.

Thus, we have seen that there are many federal and state statutes that can be utilized for the protection of aesthetic or visual resources manifested in air and

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107 Id.
108 Id.
112 Id.
water quality, archeological resources, and wildlife resources.

Other Acts Protecting Aesthetic Rights

Aesthetics, or aesthetic rights, are also mentioned specifically in some state constitutions or separate statutes. For example, Article I, Section 27, of the Pennsylvania Constitution provides:

Case Study: Assessment of Amenity Wetland Values in Juneau, Alaska

This case study summarizes part of the findings of a larger study to determine human-use values associated with wetlands near Juneau, Alaska. (Palmer and Smardon 1989; Smardon et al. 1987). Criteria for rating potential value are based on available literature. A random survey was used to systematically assess existing human-use values. This approach allowed the collection of value-oriented data that could not be inferred from visitor counts. In a sense, a survey is a plebiscite that allows a richer investigation of the public's views than is possible through a single question on a ballot. The results of the survey were then analyzed and interpreted with decision rules so as to be integrated with the overall procedures used to assess and manage Juneau's wetlands (see Adamus et al. 1983 and 1987).

Juneau's Situation

The settlement of Juneau, Alaska (Figure 10.12), was determined by the location nearby of gold deposits rather than by its suitability as a site to build a community. In general, there are two types of building sites in Juneau, those on steep or avalanche-prone uplands and those in wetlands. For a time, desirable building sites were located on the most suitable upland areas or created by using discarded mine material to fill wetlands.

During the 1960s active development extended north of Juneau into the Mendenhall Valley, an area that was predominately wetland. This area is shown in Figure 10.13, which indicates the location of the major wetland systems immediately north of the original settlement. By the early 1960s the population of the Mendenhall Valley had reached 7,500 people, with an annual growth rate of nearly 10 percent. The comprehensive plan for the valley adopted in 1973 forecast an ultimate population of 18,700 residents on the east side and 9,600 on the west side of the river. A similar rate of growth was projected for Douglas Island if a second channel crossing were constructed.

In 1976 the U.S. Army Corps of Engineers was authorized under Section 404 of the Clean Water Act to regulate the discharge of dredged or fill material into navigable waters and adjacent wetlands, as described earlier in this chapter. Pressure for rapid residential and commercial development accompanied the economic boom associated with oil development in Alaska. After a decade of weak enforcement and poor compliance, a federal injunction halted development on wetlands until the city/borough of Juneau determined which of the remaining wetlands were most effective in performing certain natural functions in the public interest. An intractable situation was established between the mandate of the federal agencies to protect the natural environment and the needs of the population of Juneau to grow and develop. Both perspectives, pro-development and pro-protection, were recognized as having a significant public support.

In May 1986 a contract was let to Adamus Resource Assessment, Inc., to evaluate wetland functions. In the past, wetland functions had been viewed primarily as part of the natural ecosystem. However, the city/borough of Juneau insisted the “public interest” also required the human-use functions of wetlands be evaluated.

This case study briefly reviews the findings of assessing the visual amenity values (Palmer and Smardon, 1988b) associated with wetlands near Juneau, Alaska. The approach chosen used a random survey to systematically determine these values. The larger human-use survey is described by a companion paper (Palmer and Smardon 1988a).

Methods

Scoping workshops were convened during June 1986 to better understand the public’s perception of the issues. In addition, site visits were made to the major wetland areas, and a photographic inventory compiled. Based on the workshop results, a survey was prepared to assess public perceptions of (1) special issues and concerns, (2) the importance of wetland functions and attributes, (3) recreation use, and (4) wetland scenic quality. While scenic values were part of the first three sections, they were principally assessed through the evaluation of wetland scenes in the fourth section of the survey.

During October 1986 questionnaires were mailed to 1,560 residences that were randomly identified from the Juneau City Directory. A second mailing was made in December to all those who had not responded by that time. Of these, 197 were returned because there was no mail receptacle at the address. These were replaced by 199 randomly selected residential postal boxes. An additional 568 questionnaires were returned by the Postal Service for other reasons. A total of 431 responses were received out of a possible 994, for a total response rate of 43 percent.

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114 Pa. Const. Art. 1, s. 27.
FIGURE 10.12 a, b, c  Juneau setting. Photo credit: R. C. Smardon

FIGURE 10.13  Map of Juneau study area. Graphic credit: James F. Palmer
Visual Presentation

The sixteen scenes selected to represent the range of visual character and intensity of development among Juneau’s wetlands were evaluated by respondents for their scenic quality. The procedure used a nine-point rating scale ranging from 1 (very high scenic quality) to 9 (very low scenic quality). The scenes were offset-printed in black and white and included in the survey (see Figure 10.14).

These wetland scenes represent three visual conditions: open water, low vegetation, and high vegetation. In Juneau, saturated areas with unconsolidated bottoms, beds of floating vascular aquatic plants, and nonpersistent and persistent emergent vegetation are found in open-water wetland areas. Low vegetation areas include deciduous (broad leaf) and evergreen (needle leaf) which are scrub-shrub wetlands. Forested deciduous and evergreen wetlands represent a high vegetation condition. Filled wetlands were also evaluated, since they were the significant alternative condition proposed for much of the wetlands being studied. The effect of development within a view on wetland scenic quality is evaluated by comparing four development intensities represented among wetland scenes: natural or undeveloped, roads or ground freshly broken for construction, residential, and commercial or industrial areas.

Results

*Wetland Scenic Quality*

The visual character and development intensity of each evaluated scene is listed in Table 10.1, which also shows their mean ratings and 95 percent confidence intervals. While there are clearly scenic differences among the scenes, they are difficult to evaluate without considering the general attributes of the Juneau area. The results of the analysis of variance indicate significant differences that are attributable to both development intensity and visual character as well as to the interaction between the two.
FIGURE 10.14  (Continued) Juneau Study Photoquestionnaire.
FIGURE 10.14 (Continued) Juneau Study Photoquestionnaire.
TABLE 10.1 Visual Preference Survey Results. Credit: J. F. Palmer

<table>
<thead>
<tr>
<th>Photograph</th>
<th>Visual Character</th>
<th>Development Intensity</th>
<th>Mean Visual Quality</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Low vegetation</td>
<td>Undeveloped</td>
<td>2.49</td>
<td>.18 *</td>
</tr>
<tr>
<td>1</td>
<td>High vegetation</td>
<td>Undeveloped</td>
<td>2.35</td>
<td>.21 *</td>
</tr>
<tr>
<td>9</td>
<td>Low vegetation</td>
<td>Residence</td>
<td>3.47</td>
<td>.18 *</td>
</tr>
<tr>
<td>12</td>
<td>Low vegetation</td>
<td>Residence</td>
<td>4.48</td>
<td>.18 *</td>
</tr>
<tr>
<td>4</td>
<td>Low vegetation</td>
<td>Construction/Road</td>
<td>4.70</td>
<td>.21 *</td>
</tr>
<tr>
<td>14</td>
<td>Open water</td>
<td>Construction/Road</td>
<td>4.89</td>
<td>.20 *</td>
</tr>
<tr>
<td>6</td>
<td>High vegetation</td>
<td>Residence</td>
<td>5.04</td>
<td>.18 *</td>
</tr>
<tr>
<td>7</td>
<td>Open water</td>
<td>Residence</td>
<td>5.05</td>
<td>.20 *</td>
</tr>
<tr>
<td>15</td>
<td>Filled</td>
<td>Construction/Road</td>
<td>5.41</td>
<td>.21 *</td>
</tr>
<tr>
<td>3</td>
<td>High vegetation</td>
<td>Residence</td>
<td>5.69</td>
<td>.17 *</td>
</tr>
<tr>
<td>16</td>
<td>Filled</td>
<td>Construction/Road</td>
<td>5.88</td>
<td>.21 *</td>
</tr>
<tr>
<td>11</td>
<td>Filled</td>
<td>Construction/Road</td>
<td>6.67</td>
<td>.18 *</td>
</tr>
<tr>
<td>13</td>
<td>Low vegetation</td>
<td>Commercial</td>
<td>6.74</td>
<td>.17 *</td>
</tr>
<tr>
<td>10</td>
<td>Low vegetation</td>
<td>Commercial</td>
<td>6.83</td>
<td>.18 *</td>
</tr>
<tr>
<td>5</td>
<td>Filled</td>
<td>Residence</td>
<td>7.13</td>
<td>.16 *</td>
</tr>
<tr>
<td>8</td>
<td>High vegetation</td>
<td>Construction/Road</td>
<td>7.23</td>
<td>.21 *</td>
</tr>
</tbody>
</table>

*Note: There are about 400 survey respondents from the sample survey. The photographs were rated on a 9-point scale where 1 was very high scenic quality and 9 was very low scenic quality.

The results are more easily interpreted by referring to Figure 10.15, which is the plot of the scenic value for each combination of visual character and development intensity represented by the scenes. Generally speaking, the highest quality areas are either open water or low vegetated. A posterior multiple-comparison Scheffe test of the four visual character types indicates that the scenic quality of open water and low vegetation wetlands is not significantly different. However, they are of significantly higher quality than high vegetation wetlands, which are in turn of higher quality than filled wetlands. The Scheffe test comparing development intensities found significant differences among four levels. The natural condition is of distinctly higher quality, followed by residential areas, then roads or construction disturbance, and finally commercial areas.

Criteria Ratings

The method of wetland functional assessment developed by Adamus et al. (1983) rates wetland areas as either high, moderate, or low, according to their importance for the various functions. The survey results clearly indicate that open water or saturated wetlands, as well as those with low vegetation, are very important to Juneau's scenic quality. In an undisturbed state, wetlands with high vegetation, especially when it is deciduous, have the potential for high scenic quality but may also be of moderate scenic quality. Once filled, wetlands lose much of their scenic quality. In addition, wetland scenic quality is particularly sensitive to deterioration from development within the scene. The results of the scenic quality survey are reinterpreted in Figure 10.16 to indicate the appropriate ranking for each wetland character.

Comparison with Other Wetland Functions

It is not intended that the ratings for a wetland's functions be given equal weight. Their relative importance may be determined by their abundance or scarcity in relation to the observed need. Alternately, the public may contribute to identifying their relative value.

Survey respondents indicated how they valued various wetland functions and attributes based on a standard value of
wetland biological productivity. One suspects the very high value placed on having litter-free wetlands is directly related to the significant trash problem, which had become a constant eyesore in Juneau’s wetlands.

Among the remaining attributes are eight that are valued as more important than open space. Among these eight attributes are three that indicate an important desire for visible indications that Juneau’s wetlands are healthy: clarity and condition of the water, scenic features, and undisturbed area of wetlands. These results show that the public can place significant value on scenic quality when compared to other wetland functions, even though it may be difficult to quantify in dollars and cents.

Conclusions

This case study describes a successful approach to meaningfully incorporate visual amenity values along with other wetland functions in a comprehensive assessment (Smardon et al. 1987). In reflecting upon the value of the overall study, Adamus et al. (1987, p. 7) note that:

The accuracy of the study’s ratings of particular functions depended not only on manpower expended by topic, but on the general amenability or intractability of meaningfully measuring the function in the course of a field season.

Adamus et al. go on to indicate that the human-use functions are second or third from the top, based on their professional subjective evaluation of the relative confidence they have in the ten rated functions (Adamus et al. 1987, p. 11).

---

**TABLE 10.2  Ranking of Overall Wetland Values. Credit: J. F. Palmer**

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Most Important</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wildlife habitat</td>
<td>229.2</td>
<td>17.5 *</td>
</tr>
<tr>
<td>Being free of litter</td>
<td>226.7</td>
<td>18.7 *</td>
</tr>
<tr>
<td>Fisheries habitat</td>
<td>212.6</td>
<td>15.5 *</td>
</tr>
<tr>
<td><strong>More Important</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water condition (e.g., clarity, color, litter, etc.)</td>
<td>192.0</td>
<td>14.9 *</td>
</tr>
<tr>
<td>Scenic features</td>
<td>180.8</td>
<td>14.4 *</td>
</tr>
<tr>
<td>Undisturbed areas of wetlands</td>
<td>171.2</td>
<td>15.2 *</td>
</tr>
<tr>
<td>Public ownership of selected wetland areas</td>
<td>188.9</td>
<td>17.4 *</td>
</tr>
<tr>
<td>Opportunities for solitude</td>
<td>147.3</td>
<td>13.8 *</td>
</tr>
<tr>
<td>Opportunities to fish</td>
<td>141.7</td>
<td>11.6 *</td>
</tr>
<tr>
<td>Opportunities for passive recreation (bird watching)</td>
<td>138.7</td>
<td>13.0 *</td>
</tr>
<tr>
<td>Opportunities for nature walks</td>
<td>134.1</td>
<td>11.7 *</td>
</tr>
<tr>
<td><strong>Important</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flood protection</td>
<td>112.3</td>
<td>12.3 *</td>
</tr>
<tr>
<td>Accessibility of wetlands</td>
<td>108.6</td>
<td>10.3 *</td>
</tr>
<tr>
<td>Opportunities to hunt</td>
<td>107.6</td>
<td>11.9 *</td>
</tr>
<tr>
<td>Area for children to play</td>
<td>104.8</td>
<td>10.8 *</td>
</tr>
<tr>
<td>Open space</td>
<td>100.0</td>
<td>- *</td>
</tr>
<tr>
<td>Having some wetlands near to your home</td>
<td>97.5</td>
<td>12.0 *</td>
</tr>
<tr>
<td>Food gathering opportunities</td>
<td>88.2</td>
<td>10.2 *</td>
</tr>
<tr>
<td><strong>Less Important</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area for economic development</td>
<td>73.9</td>
<td>11.7 *</td>
</tr>
<tr>
<td>Area for residential development</td>
<td>66.8</td>
<td>9.7 *</td>
</tr>
</tbody>
</table>

*Note: All importance ratings are calibrated to an open space value of 100. The highest value accepted as credible is 1990.*
Those of us involved with visual assessments have reason to be reassured from this evaluation. It is time we became more comfortable with having the validity and reliability of our work compared to other scientific environmental assessments. Finally, it should be noted that the city/borough of Juneau is developing a comprehensive wetland management plan that incorporates the results of this study plus public input. Such a management plan also includes appropriate controls applied to a prioritized system for wetland protection.


National Technical Advisory Committee. 1998. Water quality criteria, Report of the National Technical Advisory Committee to the Secretary of the Interior, Federal Water Pollution Control Administration, U.S. GPO.


Shiyam, C. A. and Smardon, R. C. 1990. Wetland Heritage assessment: Methodology and literature review as part of wetland evaluation technique. IEPP Report 90-4, prepared for U.S. Army Corps of Engineers Waterways Experimental Station by Institute for Environmental Policy and Planning, SUNY/ESF.


