Wetlands Functions & Values in Louisiana
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At no other time in history have wetlands received more attention and interest from Louisiana citizens. The numerous functions and values that wetlands provide are more and more being identified and appreciated, thus providing the strong support for protection and restoration-oriented federal and state wetland policies.

During Colonial times, the area that now makes up the 48 mainland United States contained an estimated 221 million acres of wetlands. Today, this same area contains approximately 103 million acres, a reduction of more than 53%. The nation’s expanding population and growing need for food, fiber and housing fueled continued wetland conversion that reached a peak between 1950 and the late 1970s.

Coastal wetlands not specifically associated with agricultural activities also experienced tremendous loss rates. Louisiana’s coastal marshes are disappearing at an alarming rate of 16,000 to 20,000 acres per year. Studies have shown that if this is not curtailed, the Gulf of Mexico may advance inland as much as 33 miles, transforming former productive marsh areas into open water bays. Considering the current rate of loss, by the year 2050 Louisiana will have lost more than 1 million acres of coastal wetlands, an area larger than Rhode Island.

Overall, wetlands in the lower 48 states make up only 5% of the land area, but the numerous functions and values they provide to society go beyond this seemingly insignificant size.

Early public concern for wetland values first surfaced in the 1930s when sportsmen recognized the importance of wetland habitats in maintaining migratory waterfowl. Congress responded to these concerns by enacting laws requiring waterfowl hunters to purchase permits and dedicating the revenues raised toward acquisition of wetland habitats important to waterfowl.

Today, wetlands protection in the U.S. is accomplished primarily through the Clean Water Act which was first enacted in 1972. This Act regulates all dredge and fill activities in “waters of the U.S.” (which includes wetlands) and is administered by the U.S. Army Corps of Engineers (COE) and the U.S. Environmental Protection Agency (EPA).

Wetlands defined

Wetlands are defined by the COE and EPA as: “Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soils.”

The COE cites the following situations as strong evidence of wetlands occurrence:

1) Area lies in a floodplain or contains low spots in which water stands at or above the soil surface for more than seven (7) consecutive days during the growing season.

2) Plant communities are present in the area that normally occur in areas having standing water for part of the growing season.

3) Area has soils known as peats, mucks or heavy clays.

4) Area is periodically flooded by tides including strong wind-driven or spring tides.

Categories of wetlands

Wetlands in Louisiana can be grouped into three general categories:

1) Salt and brackish marshes - In the U.S. there are approximately 5 million acres of salt and brackish marshes. Most extensive along the Atlantic and Gulf of Mexico coastal states, these wetlands make up about 80% of all U.S. coastal wetlands. Louisiana contains more than 2,567,000 acres of marshes in this category.

2) Freshwater marshes - Roughly 25 million acres of wetlands in the U.S. are freshwater marshes. These marshes are dominated by grasslike plant species including sedges, grasses, rushes and cattails. In Louisiana more than 1,643,000 acres of freshwater marshes remain.

3) Forested wetlands - More than 82 million acres of forested wetlands can be found in the lower 48 U.S. states. Many occur in floodplains of rivers and streams located throughout the country. Hardwood species common to southern forested wetlands include water tupelo and bald cypress in areas of prolonged flooding, and elm, ash, sugarberry (hackberry), oaks, hickory and maple in areas that are seasonally flooded. More than 6,877,000 acres of forested wetlands can currently be found in Louisiana.
Causes of wetland loss

Important causes of wetlands loss include a combination of natural causes and human activities. These include 1) agricultural conversions, 2) freshwater flow restrictions, 3) subsidence, 4) wave erosion, 5) saltwater intrusion, 6) relative sea level rise, 7) canal and levee construction, and 8) tropical storms and hurricanes.

Before 1978, federal farm policies encouraged wetland conversions to cropland through both financial and technical assistance. The 1985 and 1990 Farm Bills largely eliminated federal incentives for wetlands conversions through what is commonly referred to as the “Swampbuster” provisions. “Swampbuster” basically prohibited farm program payments to any farmer who converted wetlands to cropland after December 23, 1985. Since the implementation of these provisions, conversions attributed to agriculture have slowed significantly. Additionally, wetlands restoration provisions encompassed in the 1990 Farm Bill through the Wetlands Reserve Program (WRP) may eventually lead to the restoration of more than 1 million acres of prior converted cropland by 1995.

Many other factors not related to agriculture combine to influence decisions to convert or degrade wetlands:

1) Individuals making decisions on the use of property containing or adjacent to wetlands are frequently unaware of the functions wetlands serve and the benefits obtained from maintaining them in a natural state.

2) The benefits of preserving wetlands frequently accrue to a much larger group than the individual landowner; however, the costs and lost development opportunities fall solely on the landowner.

3) Problems of wetlands loss and degradation are often the result of many individual decisions to drain, fill or degrade small wetlands parcels over an extended period. The marginal negative impact of these isolated decisions may not be very significant or easily quantified when compared to the benefits of development which are quantifiable and immediate. Cumulative effects of these activities to a region or watershed are often not taken into account.

4) Conflicts between private property rights and common (public) property resources associated with wetlands often compound the issue of wetlands conversion. Intervention into the use of private property is often considered intrusive. Under extreme circumstances, a “taking” may take place when wetland regulations cause the landowner to lose all of the expected economic benefits associated with the land. In some cases, landowners must then be paid just compensation. Circumstances creating a “taking,” however, have not been well defined in federal and state courts.

“No Net Loss”

Federal wetland policy has recently called for a “No Net Loss” wetlands regulatory objective. “No Net Loss” basically means that an acre of wetlands must be restored or created for every acre converted or lost because of human activities. This policy has been very controversial both because of its aggressive approach and because of concerns associated with a policy that considers only wetlands quantity and not wetlands quality losses.

Some of the services provided by wetlands are considered irreplaceable, such as specialized habitats used by certain rare or endangered animals or plant species. Other services, however, can be replaced at great public and private expense. Polluted waters could be purified through the construction of costly treatment facilities. Shorelines could be protected by bulkheads or rip rap. Insurance premiums could be increased to pay for recurring and increased flood damages. Use of limited supplies of groundwater could be closely monitored and eventually rationed. Hunting and fishing could eventually be replaced by other forms of wetlands recreation. These are just a few of the expenditures and changes that might be necessary if we do not maintain and protect our valuable Louisiana wetlands.

Wetlands are fragile and finite. The broad wetlands functions and values listed and discussed below illustrate why we should join together to protect this extremely valuable national treasure. We are only now beginning to understand how important wetlands are to environmental health and quality of life; many important challenges lie ahead.
Wetlands Functions and Values in Louisiana

1. Commercial values
   - fisheries
   - forestry
   - furbearers
   - alligators
   - farming and ranching
   - oil and gas

2. Recreational values
   - sport fishing and hunting
   - eco-tourism
   - cultural values

3. Wildlife habitat
   - threatened and endangered species
   - aquatic productivity
   - species diversity
     (biodiversity)

4. Water quality
   - non-point source pollution
   - nutrient and sediment reduction
   - chemical pollution reduction
   - groundwater recharge and discharge

5. Storm buffer
Commercial Values

Wetlands provide a variety of commercial products that are extremely important to society such as food, fiber, lumber and energy resources.

Fisheries

In 1990 fisheries landings had a direct dockside value of $3.6 billion in the United States. This generated total consumer expenditures exceeding $26 billion.

More than 70% of the commercial fisheries value in the U.S. consists of species that use coastal wetlands estuaries sometime during their life cycle. More than 95% of the commercial fish landed in the Gulf of Mexico depend heavily on estuarine wetlands habitats. Coastal wetlands serve as a valuable nursery for fisheries such as shrimp, blue crabs, oysters, menhaden and numerous marine finfish species.

Wetlands-related freshwater fisheries such as crawfish, catfish, buffalo fish, gaspereau and carp are also important.

In Louisiana, commercially harvested fisheries resources are a vital part of the economy. Fisheries landings contribute more than $300 million (dockside value) per year to the economy, providing thousands of fishing and processing related jobs.

Forestry

Timber production in wetlands areas is extremely important and vital to many rural communities in Louisiana. In the U.S. more than 82 million acres of forests are classified as forested wetlands. The value of southern wetlands forests exceeds $10 billion annually. Sustainable harvests have occurred in wetlands forests for many years, and with proper management this vitally important compatible use will continue to provide both income and jobs.

Furbearers

More than 40% of the nation’s wild fur harvests come from Louisiana’s wetlands. Economically important furbearers include nutria, muskrat, mink, raccoon, otter, bobcat, beaver, coyote and opossum. In many coastal areas of Louisiana, nutria populations exceed the carrying capacity of the wetlands habitat they inhabit.
and extensive damage to wetland vegetation has resulted. A strong fur market is the most effective solution to this problem. The harvest of fur resources not only produces income for many Louisiana rural residents, but also helps to reduce the amount of wetlands loss in Louisiana's fragile coastal region.

**Alligators**

Both wild and farm-raised alligator harvests are vitally linked to Louisiana's wetlands regions. More than 25,000 wild alligators are harvested each year in Louisiana for hides and meat. Farm-raised alligators, which have recently grown in importance, are mostly grown from wild stock through a program called "ranching." Through "ranching," alligator eggs are taken from the wild, allowed to hatch and then grown out in controlled chambers on an alligator farm. A percentage of the hatchlings is later returned to the wild to make up for the "harvested" wild eggs. The value of hides and meat from both wild and farm harvests exceeded $16 million in 1992.

**Farming and ranching**

In many coastal and river delta parishes, crop production in jurisdictional and prior converted wetlands is very important to the local economy. Grazing and haying of wetland vegetation is extremely important to livestock producers, especially in coastal Louisiana. In drought years, wetland haying areas may be the only part of a farm that produces a harvestable crop. Coastal cattlemen in Louisiana produce thousands of cattle each year valued at more than $25 million.

**Oil and natural gas**

Oil and gas production is extremely important to Louisiana, providing both jobs and revenues for government services. Much of Louisiana's mineral production is located in the coastal wetland areas adjacent to the Gulf of Mexico. Oil and gas-related state severance taxes collected each year exceed $500 million. Approximately 150 million barrels of oil and 130 million cubic feet of natural gas are produced in Louisiana annually; much of this production is obtained from coastal wetlands.

**Recreational Values**

Recreational values are probably the most heavily used and recognized values that wetlands provide to society. These include sport hunting and fishing, eco-tourism, cultural values and aesthetic wetland uses. Expenditures in a local economy by recreationists can exceed $100 per wetlands acre per year for purchases such as gasoline, bait, shotgun shells, food and hunting leases.

**Sport hunting and fishing**

A 1980 survey by the U.S. Fish and Wildlife Service estimated that there are more than 5 million waterfowl hunters and more than 42 million sport fishermen in the United States. Waterfowl hunters are estimated to spend more than $600 million per year in hunting-related expenditures; sport fishermen's expenditures related to catching wetland-dependent species exceed $13 billion annually.

In Louisiana, almost 900,000 fishing licenses were sold in 1991, and the total recreational fishermen-related expenditures for that year were an estimated $686 million.

More than 330,000 hunting licenses were sold in Louisiana in 1991. Total expenditures by hunters for that year were more than $430 million.
Eco-tourism

Eco-tourism is defined as tourism-related visitation associated with ecological resource attractions. Activities normally associated with eco-tourism include boating, skiing, swimming, hiking, bird watching, camping, nature photography and painting.

In many rural communities in Louisiana, wetlands-related eco-tourism is perceived as an extremely important and sustainable economic activity with great potential for growth. Aesthetic wetlands values are often overlooked, but may offer the most universally attractive wetland uses for future rural economic development.

In 1980, more than 55 million people spent almost $10 billion observing and photographing waterfowl and other wetlands birds in the U.S.

In 1991, Louisiana estimated more than 1.4 million nonconsumptive fish and wildlife resource participants. Total expenditures for nonconsumptive users that year exceeded $220 million.

Cultural values

The people who inhabit the swamps, bayous and marshes of Louisiana are known worldwide for their lifestyle, good food and Acadian culture. Their strong dependence on wetlands for food and livelihood has allowed for the development of a culture uniquely Louisiana. Many visitors from throughout the world travel to Louisiana each year to experience its rich cultural diversity and taste its Cajun cuisine.
Threatened and endangered species

Currently, 79 species of animals and plants that occur in wetland habitats of the United States are listed as threatened or endangered. An additional 120 species are candidates for listing. Large mammals such as the threatened black bear require a home range as large as 40,000 acres. Only 19 forest tracts exist in the Mississippi alluvial plain that are larger than 40,000 acres in size. The endangered Florida panther, which once roamed Louisiana’s hardwood forests, requires a home range of almost 150,000 acres. The majestic whooping crane, once native to southwest Louisiana, is now critically endangered and can be found only on one wildlife refuge in Texas. Wetland wildlife species now extinct include the red wolf, Bachman’s warbler and the ivory-billed woodpecker.

Aquatic productivity

Wildlife and fisheries productivity is closely linked to the vast quantities of organic material and detritus (plant material decayed to particulates) produced in wetlands. In terms of organic material, from which all aquatic food sources originate, wetlands are two to three times as productive as the most fertile agricultural cropland. This abundant vegetative productivity allows wetlands to provide valuable habitat and food supplies to the aquatic system.

Species diversity (biodiversity)

Biodiversity refers to the many varieties of living organisms, genetic differences among them, and the communities and ecosystems in which they occur. Wetland systems are diverse and support an incredible diversity of life.

Biodiversity is important to humans because of the contributions that different organisms make to medicine, agriculture and a variety of sciences. Agronomists continuously refine existing crops, or respond to changing weather patterns or diseases, through worldwide searches for new organisms and undiscovered genetically distinct populations of well-known species. Drug companies engage in searches for promising new medicines, in part, by testing diverse plant or animal products. Additionally, as biological and genetic engineering techniques improve, the genetic variations represented by wild species will increase in value to society.

Water Quality

Many tributaries in the U.S. and Louisiana do not meet water quality standards for fishing, drinking or swimming. Clearing of forested wetlands and vegetative buffers along streams has caused increased erosion and runoff in many areas.

Wetlands filter sediments, nutrients and chemical pollutants, functioning as a giant natural tertiary water treatment system. Sediments and nutrients occur in water naturally, but can become harmful when excess concentrations are present. Excess levels can come from both point and non-point sources. Too much sediment harms aquatic life largely by burying organisms or their eggs. Sediments can also impede feeding in many organisms, especially shellfish that feed by filtering large volumes of water. Excess nutrients can contaminate drinking supplies in rural areas and can also trigger algae blooms that may reduce oxygen and cause fish kills in lakes and estuaries.

Non-point source pollution

Non-point source pollution is not caused by any one source, but may originate from the cumulative impacts of many discharges related to agriculture, marinas, urban storm water, septic tanks and construction sites.

Wetland plants have an amazing capacity to remove nitrogen and phosphorus from wastewater. Wetlands on or near croplands demonstrate an impressive ability to remove fertilizer nutrients from runoff water, reducing pollution problems in groundwater and nearby lakes, streams and rivers. Farmers are now voluntarily placing vegetative buffers and filter strips between production fields and drainage systems in an effort to reduce non-point source pollution. These water quality improvement efforts, called Best Management Practices (BMPs), are now being voluntarily implemented by agricultural producers throughout Louisiana.

Nutrient and sediment reduction

Wetlands function to control nutrient and sediment pollution in four basic ways:

1) Wetlands trap sediment as water flows from land to deeper drainage systems.
2) Wetland vegetation blocks the erosion process by maintaining soil integrity.

3) Wetlands lower flood peaks, thereby limiting erosion and sedimentation downstream.

4) Wetlands take up nutrients through vegetation or bury nutrients in the soil.

**Chemical pollution reduction**

Wetlands are very effective in removing some pesticides and heavy metals from wastewater. This important function is accomplished through three basic processes: 1) ion exchange and adsorption to sediment clays and organic compounds, 2) chemical processes that change toxic wastes into less toxic chemicals, or 3) directly through plant uptake.

**Groundwater recharge and discharge**

Wetlands play an important role in the recharge of local and regional aquifers used for drinking, irrigation and industrial applications. Discharge of water from wetlands plays an equally important role by maintaining stream flow during low water periods, supporting plant and animal life, and providing water for drinking and industrial use. In rivers a consistent flow helps regulate water temperature; in estuaries a consistent freshwater flow can help reduce the negative impacts of saltwater intrusion.
Storm Buffer

Coastal wetlands adjacent to the Gulf of Mexico serve an extremely important storm surge protection function when tropical storms or hurricanes come ashore. Research has shown that for every mile of vegetative wetlands, storm surge height can be reduced by one foot. This buffering effect was clearly evident when Hurricane Andrew hit the U.S. mainland in August 1992. In south Florida, where there is virtually no wetlands between the Atlantic Ocean and developed areas, damage to homes and property caused by the storm was much more devastating than in south Louisiana, where a large buffer of coastal marshes separate towns and cities from the Gulf of Mexico. Coastal wetlands (salt and brackish marshes, forested wetlands and barrier islands) absorb enormous amounts of wave energy and hold large quantities of water that would otherwise allow storms to do much more damage inland. Placing a value on the storm buffering benefits of wetlands is not easy; however, the coastal development infrastructure being protected is valued in the billions of dollars.

Erosion Control

Vegetated wetlands help to hold together banks of lakes, rivers and the beach rim that are often prone to serious erosion problems. When wetlands are converted and the vegetation is removed or damaged, soil erosion increases. Instead of serving as a sediment trap, wetlands become a sediment source.

Areas where bottomland hardwood forests have been cleared have experienced erosion rates as high as 7 metric tons per acre per year.

Shoreline erosion rates along Louisiana’s coastline exceed 100 feet per year in many areas. Through bank stabilization projects, these rates of loss can be reduced and interior marshes can be protected. Louisiana must continue to invest millions of dollars in wetland restoration projects to slow the tremendous coastal wetlands loss rates we experience today.

Flood Control

In 1991 more than $93 million dollars in damages were caused by flooding within the Tensas Basin of Arkansas and Louisiana. In February 1993, southeast and south-central Louisiana experienced additional flood-related damages of more than $10 million. In the United States, annual losses caused by flooding exceed $3 billion in property and 191 human lives.

Wetlands provide natural flood control by detaining floodwaters (which reduces flooding peaks) and by slowing floodwaters (which reduces the destructiveness of flooding). The presence of only 15% of a watershed in wetlands can reduce flooding peaks by as much as 60%. Maintaining wetlands near developed areas may be the least expensive insurance policy homeowners and business owners can purchase to protect their property.

Education and Scientific Research

Wetlands serve an extremely valuable educational role by providing areas for studying different plant and animal species in a natural setting. Regardless of their size, individual wetlands can provide outdoor classrooms where teachers can demonstrate the workings of nature to their students. Wetlands also provide unique laboratories where scientists can make new and useful discoveries that will benefit society in many ways: new plant varieties that are resistant to flooding or disease, medical discoveries for treating rare human diseases or simply basic knowledge that will lead to a better understanding of life itself!
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