

*Statement to the Subcommittee On National Parks And Recreation  
of the Committee on Interior and Insular Affairs, United States House of Representatives,  
at a Public Hearing held in Fort Myers on February 15, 1972,  
to consider means of protecting the Big Cypress watershed, Florida.*

---

**STATEMENT TO THE SUBCOMMITTEE ON NATIONAL PARKS AND  
RECREATION  
OF THE  
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS,  
UNITED STATES HOUSE OF REPRESENTATIVES**

Prepared by:

Arthur R. Marshall	Ecologist
Frank C. Craighead, Sr.	Ecologist
William B. Robertson, Jr.	Animal Ecologist
James H. Hartwell	Hydrologist
Bernard J. Yokel	Estuarine Ecologist

Congressman Aspinall, Congressman Taylor, and other members of the House of Representative's Subcommittee on National Parks and Recreation:

I am James H. Hartwell, a hydrologist with the Division of Applied Ecology, Center for Urban Studies, University of Miami, Florida. The following statement contains recent contributions from Arthur R. Marshall, ecologist, and Director of the Division of Applied Ecology; Dr. Frank C. Craighead, Sr., ecologist; Dr. William B. Robertson, Jr., animal ecologist; and Mr. Bernard J. Yokel, estuarine ecologist. This group has produced books, articles, and scientific publications on the Everglades region, its geology and water resources, its vegetation, soils and wildlife, that number more than a hundred. Jointly, these scientists have spent a total of 84 years studying the many and varied aspects of the Everglades ecosystem.

As concerned natural(sic) scientists, we wish to thank this subcommittee for convening this hearing in Fort Myers in an effort to become apprised of the necessity to protect the Big Cypress watershed. Not only south Floridians, but all of the people of the United States will benefit from the protection of this unique area, for its maintenance is essential to the well being of Everglades National Park and west Florida.

The principal concern is fresh water -- water for the Park, for plant life, wildlife, marine resources, recreation, and for people.

On south Florida's lower east coast, the water resources have been much abused, in both quantity and quality. As a result, this region is facing a water crisis. Last spring the long debated water management problems were accentuated by a severe drought. Restrictions on water use were

imposed and many private and public water supplies became too salty for human consumption. The lowering of water levels below the ground throughout the Everglades rendered the area tinder dry and the peat soils and vegetation burned for several weeks filling many cities with noxious smoke. The eastern cities depend upon the Everglades water to recharge its well fields.

The Big Cypress watershed also serves as a recharge area for water supplies. As the urban areas of the lower west coast expand, those municipalities will have to utilize waters farther to the east to meet their water demands; a reversed, mirror-image, if you will, of the water demand versus supply situation of the east coast cities, who must reach continually further to the west and north for potable supplies.

No one can say with certainty when the growing demand will encounter the limits of supply for the west coast cities, for no such analyses have been made farther into the future than twenty years. We can say with considerable certainty, however, that the progression of events will mirror-image those of the populous east coast, in that salt intrusions along the coastline will become increasingly severe, that intermittent water-rationing will become necessary, that recycling of sewage wastes for re-use will become as necessary on the west coast as it is now urgent on the east. Development of the Big Cypress watershed, will decrease the water supply and increasing demand will markedly accelerate the day of water crisis. The Big Cypress is the only major water source outside of Everglades National Park which has not been massively altered.

For all the years cited, the members of this panel have observed and documented the stresses generated by mistreatment of the water resources in the interior portions of the Everglades basin. As life-long students of the interdependencies in nature and of the ultimate dependence of all life on natural systems, we are not surprised that the stresses have moved to town. Unless rainfall exceeds the norm during the next few months, we have ample reason to anticipate that these problems will recur in the coming spring.

The operating agencies of the federal government did not have, prior to passage of the National Environmental Policy Act of 1969 a legislative mandate to give substantive attention to environmental values, and agencies have frequently pursued conflicting goals. State governments often have been ambivalent. Land-use management decisions which involve regional, statewide or national values are matters of broad public concern and in the past they have been given only cursory treatment. A national and state land use policy is an imperative.

### **Hydrology:**

The watershed of the Big Cypress is a broad, nearly flat area interspersed with pinelands, grass prairies and shallow cypress ponds and sloughs. With the land sloping gently south and southwest, water accumulated from the summer rains flows overland about seventy per cent of the year to and through the western panhandle of Everglades National Park into the Gulf of Mexico.

About 55% of the average annual overland flow into Everglades National Park since 1940 has been from the Big Cypress watershed. Flow in the watershed, quite unlike a normal main-stem

river, is in the form of a broad shallow sheet which covers much of the area in the summer and fall high water period. When the rains abate, beginning in November, water levels in the Big Cypress recede slowly from heights a foot or two above ground to perhaps three feet below ground in the dry months of the year.

The flora and fauna of the watershed, including that of its downstream estuaries, are attuned in their reproductive and breeding cycles to this cycle of summer flooding followed by recession. In the warm waters of the summer, many rather ignoble aquatic species such as freshwater shrimp, crayfish, mosquito fish, and killifishes reproduce themselves in great numbers, foraging over the flooded lands. As the winter recession occurs, these organisms are sufficiently concentrated to supply tremendous quantities of protein food to active bird rookeries and to some species of marine fishes which invade the brackish areas and lower marshes. Thus continued production of many animal species depends on the cycle of summer flood and subsequent recession. When wetlands are drained for development, both the flooding and the recession are so drastically altered that reproductive failures commonly occur -- which is a major reason that seventeen Everglades species are now considered rare and endangered.

### **Vegetation:**

The Big Cypress comprises the western portion of the great wetlands of Florida south of Lake Okeechobee. It is a woody swamp dominated by trees, whereas the eastern portion of the Everglades is characterized by a marsh of herbaceous plants, sedges, sawgrass and assorted grasses. A low divide separates these two portions. These wetlands catch and hold the rainfall on the area which is vital not only to the wetland resources but also for the well-being of coastal towns.

Together with the flatness of the Big Cypress, its vegetation retards the flow of surface water and permits part of it to sink into the underlying soils and bedrock aquifers. The vegetation is also responsible for the formation of the extensive peat beds of the area.

As a brief description of the vegetation of the Big Cypress, one must first think of it as a forested area spotted with many grassy prairies and rocky outcrops which stand above the general water surface for several months of the year. Under all of this lies a rather permeable limestone transversed by numerous sloughs and marked by isolated solution holes. Much of this bedrock is now covered by sandy deposits left by former seas, or by marl or peats each bearing a distinctive type of vegetation.

The rocky outcrops are covered with thin soil and pine forests which cannot stand continuous flooding.

The prairies are dominated by a mixture of grasses, sedges and a few shrub species. All can tolerate a long period of flooding during the rainy season and light fires in the winter.

The deeper sloughs -- 4 to 6 feet deep -- support stands of cypress on their thick peaty soils. The isolated potholes also support cypress in characteristic domes called cypress heads. In either situation, the deeper the peaty soil the taller the trees. Many native epiphytes -- orchids and

bromeliads -- are abundant in the Big Cypress. The orchid flora is one of the richest known anywhere outside of the tropics.

### **Wildlife:**

For most of the conservationists and scientists, the wildlife of south Florida and the Big Cypress is an essential unit of the regional ecosystem. Seventeen species that are officially listed as rare and endangered -- 4 mammals, 12 birds, and the alligator -- inhabit the Big Cypress and its downstream estuaries during at least part of the annual cycle. These include some of the most characteristic wildlife of south Florida, such as the roseate spoonbill, and species such as the brown pelican and bald eagle which have been extirpated from much of their former range in the United States. A number of these, including the Florida panther and wood ibis, are virtually certain to disappear from Florida if the Big Cypress habitat is diminished and destroyed by drainage and development.

Besides these species in the rare and endangered category, the Big Cypress supports the full spectrum of the resident and native wildlife. Of particular importance is the seasonal and alternative feeding habitat that the Big Cypress provides to wading bird populations which breed in Everglades National Park.

Without access to the resources of the Big Cypress, a long term of decline of populations of large water birds of the Park is predictable. The preservation of the Big Cypress offers the only long range hope of maintaining huntable populations of larger game animals such as white-tailed deer and wild turkeys in southern Florida.

### **The Coastal Zone:**

As water moves from the upland marshes, it finally enters the coastal zone. At the inner edge of the coastal zone fresh water marshland gives way to a broad mangrove-dominated estuarine zone. The area is characterized by mangrove-fringed creeks, ponds, and bays which receive water from both the upland marshes and the sea. The tidal mixing which occurs in these bays and estuaries produces brackish conditions favorable to the growth of estuarine-dependent animals such as shrimp, blue crabs, mullet, oysters and many gamefish.

Utilizing special processes involving tidal mixing and physico-chemical phenomena, the brackish estuaries tend to conserve the nutrients which, under natural conditions, are contributed by the upland fresh water and the open ocean. These nutrients tend to be retained in the estuary and cycled continuously in the food chain. The bays and estuaries are many fold more productive than the marshes above or the sea beyond.

The very high natural productivity found in the estuaries, which supports important National fishery resources, derives many benefits from the upland marshes. The extensive marsh system serves as a reservoir and control system which absorbs the heavy summer rains and slowly releases this water into the estuaries. This mechanism serves two important purposes. The marsh filters the water in transit, removing sediments and utilizing some of the nutrients and releases the fresh water into the estuary at a reasonably uniform rate across a broad front. Hence, the

water coming from the marshes is normally clean and arrives in quantities which usually permit optimal salinity ranges in the estuaries. Under natural drainage conditions heavy rainfall in the interior may require 10 to 90 days, dependent on distance, to appear in the estuaries because of the low gradient of the of the region and frictional effects imposed by marsh vegetation.

Man-made drainage systems, on the other hand, are designed to accelerate the run-off of fresh water through canals. During periods of heavy rainfall, canalized run-off from the uplands moves quickly in large volume into the receiving estuaries bearing massive deposits of organics, silt, and sand. Freshets of this type cause abrupt salinity changes which frequently kill plants and animals, especially attached forms such as oysters. Oxygen demand caused by abnormal quantities of organic material further stress the large bay areas, already laboring under the burden of abrupt salinity changes.

The high productivity of our coastal systems is intimately linked to upland marshes and especially to the brackish areas. To safeguard this unique unit, the entire marsh sheet flow system must be protected to insure that the coastal zone receives high quality water in sufficient quantity and in the right seasons.

### **Conclusion:**

We urgently suggest that any bill you may consider or propose state that the primary purpose of the legislation is to protect the watershed as to quantity, seasonality and quality of its waters, and that only such other uses be allowed which are consonant with that primary purpose.

There are infinite more details to the Big Cypress story, so impossible to present here that we have chosen to present a composite view of the resources and their values and problems as we see them. We have appended a list of the most significant publications which provide such details.

Further, actions taken by the people and the state of Florida this year have begun a procession to alleviate many of the problems. The ambivalence of the State is cracking.

The Speaker of the Florida House selected a special task force which has made recommendations to the presently convened legislature for protecting the water resources of Florida. Governor Askew has expressed his support of these proposals.

The Florida Cabinet is negotiating to acquire the central portion of Fakahatchee Strand -- about 25,000 acres -- and about 9,500 acres of mangrovelands in the Ten Thousand Islands area.

Last summer the Florida Cabinet stopped the construction of three new drainage canals of the Central and Southern Florida Project (C-108,109 and 110) two of which had already been commenced.

The Attorney General of Florida instituted legal proceedings to stop the construction of canals in the Big Cypress watershed south of Tamiami Trail.

Last September, Governor Askew convened more than a hundred persons to advise him on means to protect south Florida's water resources and all the values that entails. The recommendations of the conference run the gamut from renunciation of further drainage of wetlands, restoration of water quality, development of land and water use plans to protect vital resources and to limit populations, protection of the Big Cypress and re-organization of state government to provide a water management agency for the entire south Florida ecosystem.

I am optimistic enough to say that Florida is developing a new environmental ethic which is pertinent over all the land. Any decision in behalf of the Big Cypress will be a tremendous spur to us to develop that ethic; at the same time you will protect the many resources of the watershed, the western extension of Everglades National Park and the water supply for the people of southwest Florida.

We commend you for your consideration and thank you.

## REFERENCES

- Craighead, F. C. *The Trees of South Florida*. Vol. 1, University of Miami Press, 1971.
- \_\_\_\_\_. *Orchids and Other Air Plants of Everglades National Park*. University of Miami Press, 1963.
- Loveless, C. M., A. R. Marshall, et. al. *Everglades Water and its Ecological Implications*. 1970.
- Lugo, E. A. et. al. *Models for Planning and Research for the South Florida Environmental Study*. University of Florida, Gainesville, 1971.
- Parker, C. G. et al. *Water Resources of Southern Florida with Special Reference to Geology and Ground Water of the Miami Area*. Washington, D.C., U. S. Geological Survey Water Supply Paper 1255, 1955.
- Tabb, D. C. *A Summary of Existing Information on the Freshwater, Brackish Water and Marine Ecology of the Florida Everglades Region in Relation to Freshwater Needs of Everglades National Park*. University of Miami Institute of Marine Sciences, 1963.
- \_\_\_\_\_. et. al. *The Ecology of Northern Florida Bay and Adjacent Estuaries*. Board of Conservation, Technical Series 39, Tallahassee, Florida, 1962.
- State of Florida. *Report of the Governor's Conference on Water Management in South Florida*. 1971.
- U. S. Department of the Interior. *Environmental Impact of the Big Cypress Swamp Jetport*. 1969.
- \_\_\_\_\_. National Park Service. *Appraisal of Water Quality Needs and Criteria for Everglades National Park*. June, 1971.

\_\_\_\_\_. Everglades Jetport Advisory Board. *Big Cypress Watershed, Florida*. 1971

\_\_\_\_\_. Geological Survey. *Some Hydrologic and Biologic Aspects of the Big Cypress Swamp*. 1970.

\_\_\_\_\_. FWQA. *A Synoptic Survey of Limnological Characteristics of the Big Cypress Swamp, Florida*. 1970.