

VEGETATION MANAGEMENT PLAN

*Naval Live Oaks*

## TABLE OF CONTENTS

|                             | Page |
|-----------------------------|------|
| Location .....              | 1    |
| Vegetation .....            | 1    |
| Soil .....                  | 2    |
| Animals .....               | 3    |
| Weather .....               | 3    |
| Fire .....                  | 4    |
| Fire Equipment .....        | 4    |
| Management Objectives ..... | 6    |
| Alternatives .....          | 6    |
| Maps 1a, 1b - Location      |      |
| 2      - Vegetation         |      |
| 3      - Soils              |      |
| 4      - Topography         |      |

## VEGETATION MANAGEMENT PLAN

Naval Live Oaks Reservation was the first forest experiment station in the United States, therefore it is desirable to preserve large live oak trees and associated plant community. Consideration also needs to be given to proper management of other areas such as those now populated with trees of longleaf, slash and sand pine. In addition, it is advantageous to minimize danger of uncontrolled fire to private homes adjacent to park boundaries as well as to park property.

### Location

Naval Live Oaks section of Gulf Islands National Seashore lies within the city of Gulf Breeze, Santa Rosa County, Florida (maps 1a, 1b). The west boundary of the 1,337.87 acre tract is adjacent to developed areas of Gulf Breeze. The east park boundary is also the east boundary of Gulf Breeze city limits (map 2). Santa Rosa Sound is the south boundary of Naval Live Oaks, and Pensacola Bay forms most of the north boundary. The east boundary and part of the north boundary are adjacent to private homes in Santa Rosa County. A four-lane east-west highway, U.S. 98, divides Naval Live Oaks into a north portion and a south portion (map 2). North of U.S. 98, a paved county road runs parallel to the east boundary. An east-west clay county road is near the north boundary. The above mentioned boundaries are land park limits, but park jurisdiction extends under water into both Pensacola Bay and Santa Rosa Sound.

## Vegetation

### 19th Century

No maps have been located of vegetation existing in 1828. Naval Live Oaks Reservation was established by the U.S. Government in 1828 to insure a supply of oak timbers for U.S. Navy ships. A letter dated March 21, 1828, from Mr. Breckinridge, overseer of Naval Live Oaks, to the Navy Department, Washington, D.C., mentioned that pine and oak were present. In April, 1829, approximately 20,000 oak seedlings were growing in a nursery in the southwest corner of the present park. Also in the reservation were 2000 additional oaks, some 2 inches or less in diameter, others 2 to 6 inches in diameter. Presumably these larger trees were natural plantings.

### 20th Century

Sand pine (Pinus clausa) (1) forms a natural border along east and west park boundaries north of the highway (map 2). Turkey oak (Quercus laevis) is often associated with sand pines. Sand pine occurs in other areas as well, e.g., in the east central part. Several species, e.g., Quercus myrtifolia, Quercus geminata, form oak scrub areas. Also eastward, longleaf pine (Pinus palustris) extends from the highway almost to the north border of the park. Grasses and other forbs grow beneath the longleaf pine. Large live oaks (Quercus virginiana, Q. geminata) grow in several places near Pensacola Bay and in the northeast part of the park. Associated with live oak are pignut hickory (Carya glabra) and southern magnolia (Magnolia grandiflora). Often magnolia trees are scattered and hickories are

more numerous. One low, predominately grassy area is near the intersection of the north boundary line and Pensacola Bay. Another low area near the northeast corner of Naval Live Oaks is a fresh water pond which flows into Pensacola Bay. Saw grass (Cladium jamaicense) grows where ponding occurs most of the year; other grasses occur nearby.

South of U.S. 98, live oak-hickory woodlands predominate (map 2). A number of magnolia trees are here too. Eastward, a low-lying area contains slash pine (Pinus elliottii) and longleaf. In addition to oak-hickory-magnolia, at higher elevations (15 to 35 feet or more, map 4), parallel to Santa Rosa Sound, there is a low area with Titi (Cliftonia monophylla), wax myrtle (Myrica cerifera) and some grasses near the southeast park boundary. Just south of the highway, eastward, is an old sand dune covered with sand pine. Palmetto (Serenoa repens) grows throughout the reservation, particularly in some lower areas.

Sea oats (Uniola paniculata) grow along Santa Rosa Sound and Pensacola Bay shorelines.

### Soils

Soils in Naval Live Oaks are predominately sandy, underlain by recent sand and Pleistocene corase clastics and clay. Map 3 shows locations of various soil types (2). Listed below is a short description of each soil type. Soils are up to 80 inches deep. Map 4 shows elevations within park boundaries. Soil type boundaries do not necessarily coincide with elevation levels.

Pactolus - Loamy sand. Moderately well to somewhat poorly drained; slow runoff; rapid permeability. Seasonal high water table, January, December.

Dorovan-Pamlico Association - Mucky sand. 30-60" deep. Very poorly drained; permeability slow to very slow. Water covers surface often; periodic flooding.

Lakeland - Sand. More or less level to steep slopes; can be up to 30% slope. Excessively drained; very rapid permeability; slow runoff; rapid internal drainage. "D" is steeper slope than "B".

Leon - Sand. Poorly drained; runoff slow; permeability moderately rapid to rapid. Water table less than 10 inches 1-4 months of the year -- during times of high rainfall; 15-30 inches for 9 months most years; 40 inches during dry years.

Rutlege - Loamy sand. Very poorly drained; water table at or near the surface much of the year. Ponding common; runoff very slow; permeability rapid throughout.

Kureb - Sand. Excessively drained, slow runoff; rapid permeability. Water table to 6 feet most of the year.

Map 4 shows topography and location of underground utilities.

### Animals

A number of animals have been sighted on the Gulf Breeze peninsula. Mammals such as opossum, mole, woodrat, raccoon, skunk, squirrel, rabbit, grey fox and bobcat are common. Turtles, lizards, snakes,

salamanders, toads and frogs are among the fairly numerous reptiles and amphibians living in or near Naval Live Oaks Reservation. Numerous species of birds are temporary or permanent residents. Twenty-five or more bird species breed in Gulf Breeze. Many migrants can be found, in addition to winter resident bird species.

#### Weather

Local climatological data are available from the U.S. Department of Commerce National Oceanic and Atmospheric Administration (3). Environmental data are recorded at Pensacola Municipal Airport, approximately 7.3 miles north of Gulf Breeze peninsula.

Mean annual temperatures for the period 1936 to 1975 is 67.9° Fahrenheit, with a maximum mean of 75.0° Fahrenheit and a minimum mean of 60.7° Fahrenheit. Precipitation mean for the same period is 59.78 inches, practically all in the form of rain. Snow is a rare occurrence. Often it is drier part of the periods April to June and October to November, while higher amounts of precipitation occur during winter months and July to September. However, some falls and springs may have periods of high precipitation. Humidity varies from about 50% to 90% during the year. Diurnal variation is often as much as 20%, highest humidity being at midnight and 6:00 a.m., lowest at 12:00 noon. At 6:00 p.m., humidity usually is about half-way between the percentage at 12:00 noon and a higher percentage at midnight. Mean wind speed is 8.3 miles per hour with a fastest mile mean of 37 miles per hour. Prevailing winds are from the east and southeast.

### Smoke

Prevailing wind directions are from the southeast. Sometimes this shifts to a southwesterly direction. During December, January, February and March, winds can come from a northwesterly direction. Some summer winds are from a northeast or northwest direction. In short, there can be shifts from the southeast to other directions at all times of the year. Higher wind speeds tend to be from about 10:00 a.m. or 11:00 a.m. to 4:00 p.m. or 5:00 p.m. Lowest wind speeds are at night. Therefore, the best hours for prescribed burning would be in late afternoon, or night, or early morning. When a hurricane or strong northern cold fronts are approaching, sufficient warning is given so prescribed burns could be avoided during storm danger periods. Smoke direction will follow wind direction. Prescribed burning would preferably be arranged so a fire would burn toward the wind, and smoke drift is to the south out over the Gulf of Mexico.

### Fire

Records of past fires in Naval Live Oaks are incomplete at best. Prior to 1949, cattle were allowed to roam at will. In 1949, the State of Florida passed a law requiring cattle owners to keep their cattle off public highways. Santa Rosa County passed, in addition, a law requiring that cattle be confined by fences. According to longtime residents, prior to 1949, grasses beneath stands of longleaf pine were burned periodically to provide pastures of young grasses. Since that time, few fires have been set for that reason on uninhabited wooded

property. In Naval Live Oaks, several fires have occurred at various times with the result that a number of acres of sand pine have probably been destroyed. Scrub oak now predominates where sand pine formerly grew. Some scrub oak sites have existed for a number of years. In old (4) naval records, one statement (June, 1828) noted that scrub oak was present in the middle of Naval Live Oaks. A July, 1830, notation made the same statement, and added that the rest was pine barren. Probably this means sand pine, and undoubtedly refers to much of the existing sand pine-oak scrub area north of U.S. 98 (map 2, 1977).

In January, 1976, an arson fire was started in the northwest corner of Naval Live Oaks, and in September, 1976, a fire was set by children playing just east of the park boundary. This latter fire did not spread into park property.

#### Fire Equipment

Florida Division of Forestry fire detection is provided by Mulat tower in Santa Rosa County just north of Interstate 10 (see Map 1). Florida also maintains towers at Beulah (Philpot Tower) in southern Escambia County and at Coldwater, northeast of Milton, Santa Rosa County. Florida Division of Forestry has the following fire suppression equipment available:

1 pumper, 1 light tanker (water only)

pick-up trucks

4 medium transports with tractors and plows

miscellaneous hand tools, backpack pumps, backfire torches

additional equipment is available on call

Personnel: Consists of the Forest Ranger Supervisor and 4 two-man crews. Time off and leave is regulated within crews so that each suppression unit is in service at all times, although sometimes with only one member of the crew on duty. Reserve units in adjacent counties and the districts are also in service at all times. The Forest Ranger Supervisor and dispatcher can be reached at the following number: 986-2705 (Molino, Florida).

Gulf Islands National Seashore equipment is as follows:

3 tractors with 3-point hitch

1 4x4 Fire Pumper, 250 gallon tank, 300 GPM at 150 PSI

miscellaneous hand tools, backpack pumps, backfire torches

Personnel: Gulf Islands National Seashore (Florida) personnel available for fire suppression consists of a minimum of 20 employees year round (protection and maintenance). Time off and leave time is regulated with crews so that 3 to 6 members of the crew are on duty at all times.

Additional organizations that will assist are:

Gulf Breeze Volunteer Fire Department with:

1 500 GPM pumper at 150 PSI plus a 5000 gallon tank truck

1 1000 GPM pumper at 150 PSI

1 quick response fire rescue truck with 175 gallon tank and  
booster pump

This equipment is designed for use on firm road beds.

About 34 volunteers are on call. A special bell rings in each volunteer's home in case of fire.

Midway Volunteer Fire Department (about 10 miles east of Naval Live Oaks) (map 1) with:

1 300 gallon tank mounted on reconditioned truck

Trucks not yet ready; work being done during 1977:

1 750 gallon tank, 750 GPM

1 1400 gallon tank, 500 GPM

About 40 volunteers are on call.

Gulf Breeze and Midway Fire Departments can be reached through an emergency number: Pensacola 434-2253.

#### Management Objectives

Existing stands of live oak-hickory-magnolia should be maintained. In addition, longleaf, slash and sand pine trees are worth preserving. Smaller acreages of communities such as titi-wax myrtle and saw grass are valuable as examples of vegetation types which occur in Santa Rosa County and in Northwest Florida. Numerous species associated with the above mentioned plants provide interest for the botanist as well as food and shelter for animal species living in Naval Live Oaks. Some of these animals and plant species are fire-dependent. Thus, one can find examples of different ecological habitats within the 1,300 acres.

In some places, there is a large amount of potential fuel in Naval Live Oaks. It is present in the form of grasses, shrubs beneath trees, and trees that have been felled as a result of wind or other forces of nature. Even living sand pine can provide fuel.

Preservation and rejuvenation of as many species as possible, together with reduction of total amount of potential fuel, are prime

objectives. At the same time, steps should be taken to protect private property adjacent to park boundaries.

### Alternatives

1. No action. This would leave Naval Live Oaks Reservation in its present state. However, in time, heavy and potentially damaging fuel accumulation would build up. Existing boundaries such as Pensacola Bay, Santa Rosa Sound, and adjacent highways and roads would have to serve as fire lanes. If a fire started, it might burn a large area, leaving vegetation on that site totally destroyed -- or all of Naval Live Oaks could be destroyed. Damage to adjacent private property could be extensive.

2. Plow fire lanes only and maintain them. Lanes would be plowed parallel to west, east and north park boundaries. Fire lanes would be north of U.S. 98 using the north-south unpaved road and the east-west trail (map 4). Fire lanes would help confine some fires within certain boundaries. However, if winds are strong, fire may crown and cross fire lanes or even a road. Damage to adjacent private property would be extensive.

3. Thin mechanically under live oak trees in the southwest corner of the park and under sand pine along east and west park boundaries in addition to plowing fire lanes as in alternative No. 2. This would eliminate a large amount of potential fuel and help reduce danger of fire spreading rapidly. A reduction in number of uncontrollable fires

may result with less fuel and more sites where fire control equipment could easily enter a burning area. The added precautions of mechanical thinning along park boundaries would reduce danger to adjacent private property.

4. Plow fire lanes, prescribe burn some sites, mechanically thin others, and leave still other areas as they now exist.

Fire lanes would be plowed as listed under alternative No. 2.

Some prescribed burning would be advantageous in the southwest corner of Naval Live Oaks where an archeological site is covered by grasses and shrubs. Burning here, and under nearby live oak trees, would be helpful for historical study, as well as for fuel removal. Some sites both north and south of U.S. 98 have been maintained in a cleared state for a number of years by Boy and Girl Scouts. These sites could remain essentially as they now exist, as could other live oak tree areas.

Mechanical thinning of shrub growth beneath sand pine is particularly desirable along east and west park boundaries north of U.S. 98. A strip at least 50 feet wide should be cut to within about 6 inches above ground level. This would reduce some potential fuel and help to protect sand pines as well as adjacent private homes. Fire lanes, mentioned above, would be plowed in addition to mechanical removal.

At some sites, grasses and shrubs now present beneath longleaf and slash pines would be removed by prescribed burning. Young growth which will appear after a burn will provide food for wildlife such as quail.

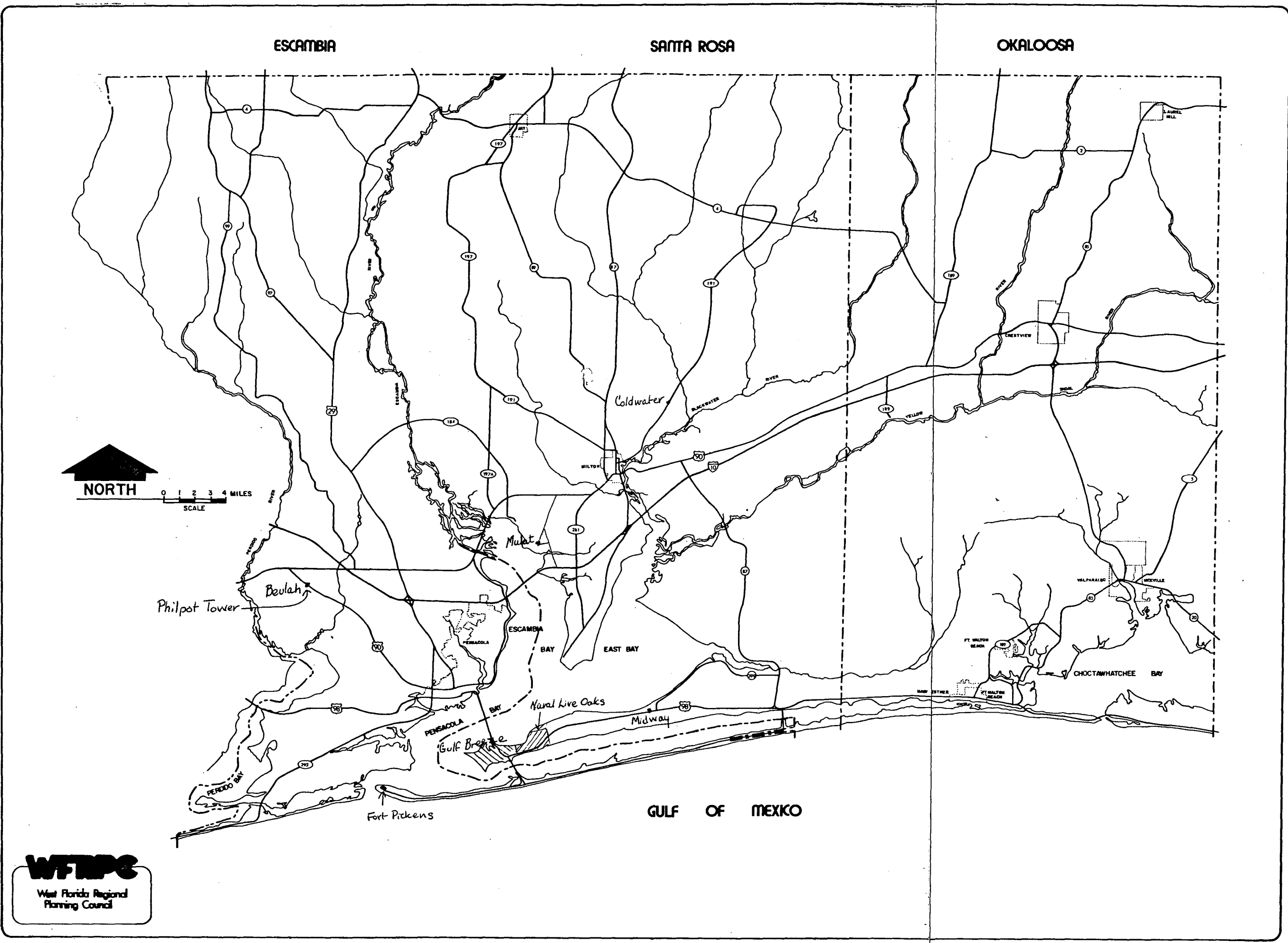
Areas which would remain in their present state would be those such as scrub oak and sand pine in more central locations, titi swamps, saw grass-high water table locations, and some live oak tree sites.

A living educational exhibit could be set up by arranging to retain some sites in their present state, use mechanical removal in others, prescribe burn in some areas, and combine mechanical fuel removal with prescribed burn at still other sites. Thus, plots could be designated for different treatments in one or more locations. Longleaf pine would provide an excellent demonstration, and scrub oak could be used in a limited way.

A combination of plowed fire lanes, mechanical removal of vegetation and controlled burning, as noted above, will decrease the potential fuel load, thereby reducing presently existing fire hazards. Park property and private property will both be afforded more fire protection as suggested in alternative No. 4 than in the other alternatives.

Prior to carrying out any of the above alternatives, it will be necessary to meet with owners of homes adjacent to the park, as well as interested citizens from nearby areas such as Gulf Breeze and Pensacola, to explain park objectives for Naval Live Oaks Reservation and the vegetation management objectives.

1. Kurz, H. and R. K. Godfrey, 1962. Trees of Northern Florida,  
University of Florida Press, Gainesville.
2. Survey in Progress, 1976-1977. Soil Survey of Santa Rosa County,  
Florida. Soil Conservation Service, U.S.D.A.
3. 1975. Local climatological data: Annual summary with comparative  
data, Pensacola, Florida. National Oceanic and Atmospheric  
Administration (NOAA). Environmental Data Service. National  
Climatic Center, Asheville, N. C.
4. American State Papers on Naval Affairs. June, 1928. Letter from  
H. Breckenridge to S. Southard, Secretary of the Navy, U. S.



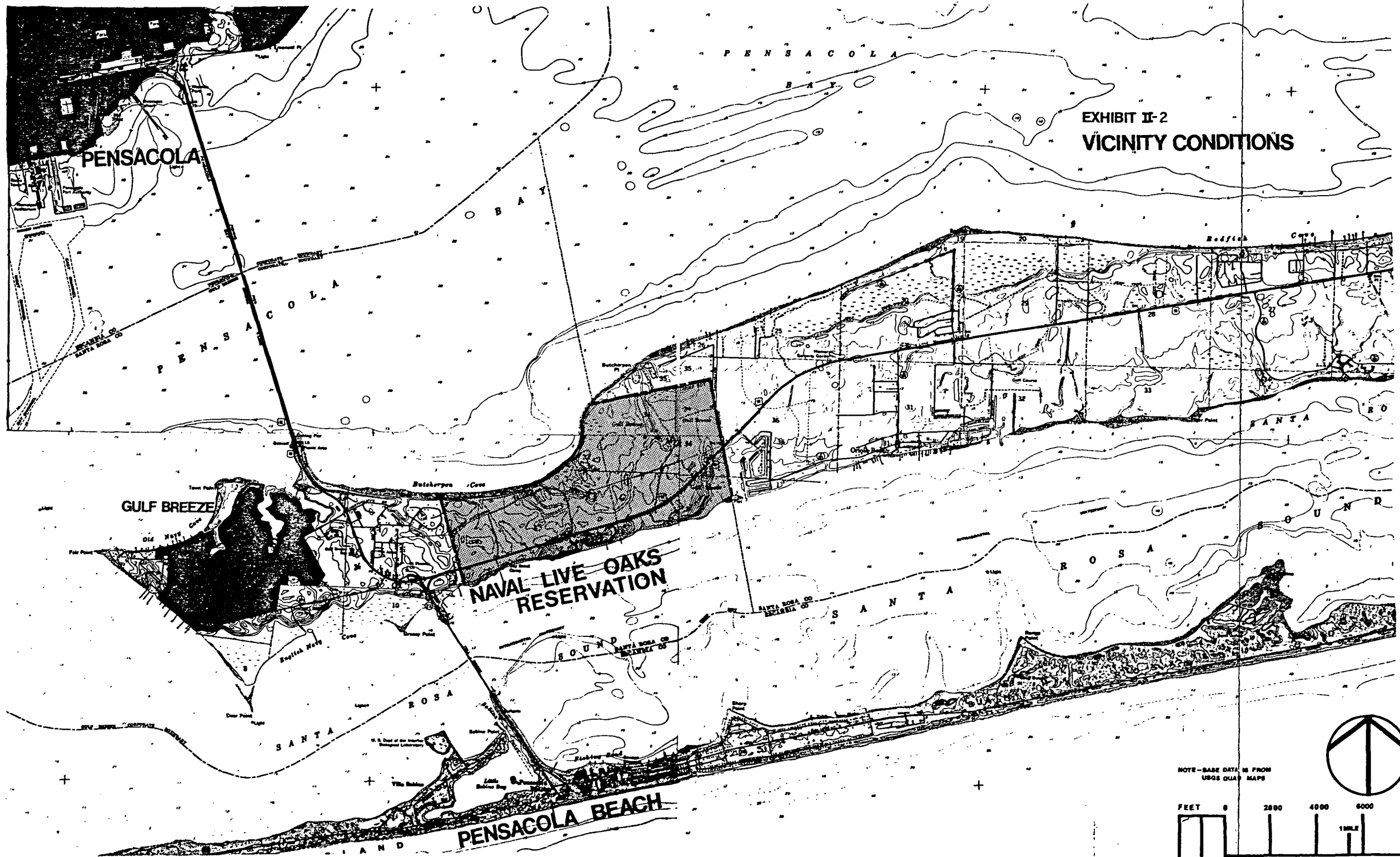


EXHIBIT II-2  
VICINITY CONDITIONS

NAVAL LIVE OAKS RESERVATION

NOTE - BASE DATA IS FROM  
USGS QUAD MAPS

FEET 0 2000 4000 6000 8000  
1 MILE

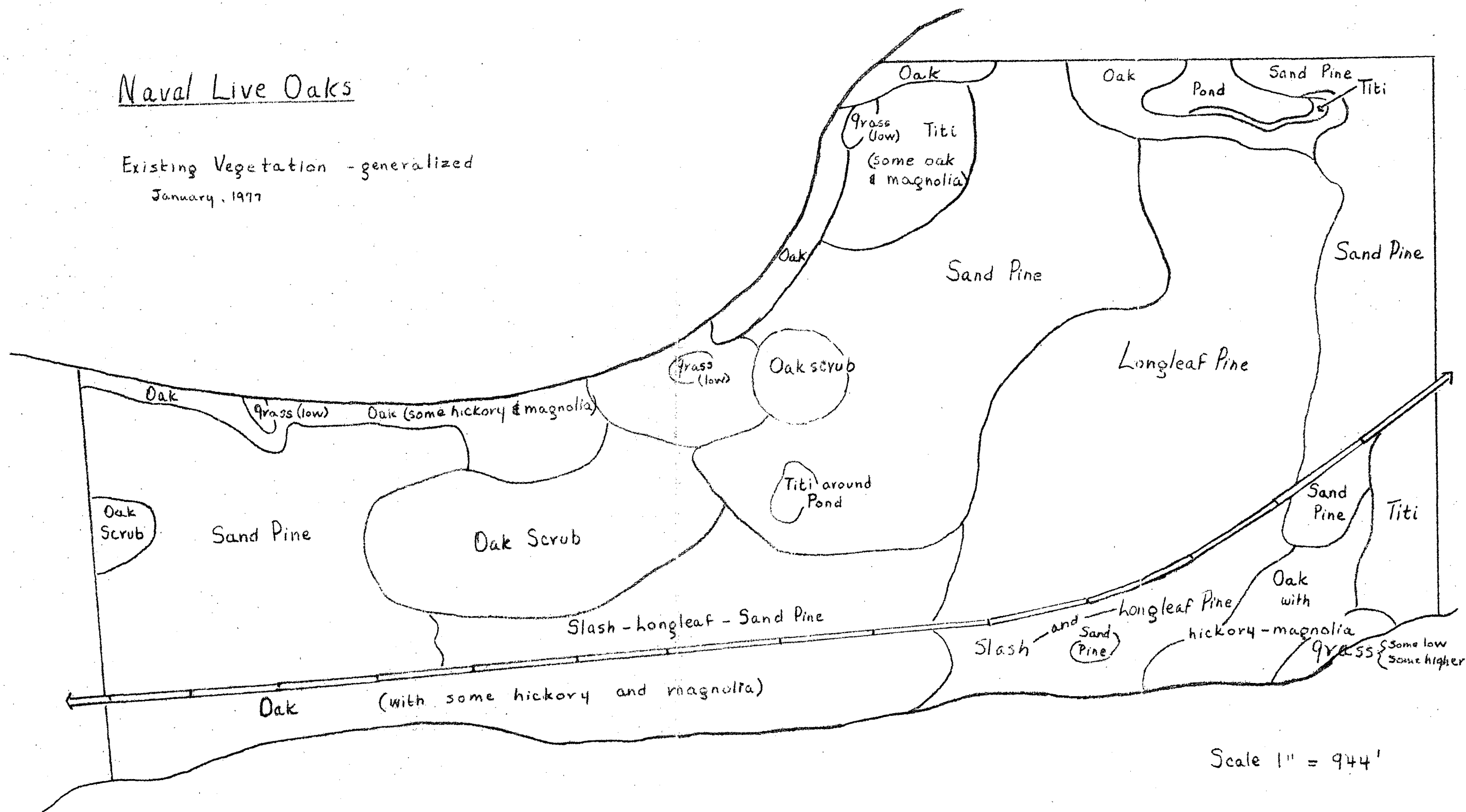
DEVELOPMENT  
CONCEPT PLAN

U.S. DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

U.S. 40,022A  
DEC JUNE 76

# Naval Live Oaks

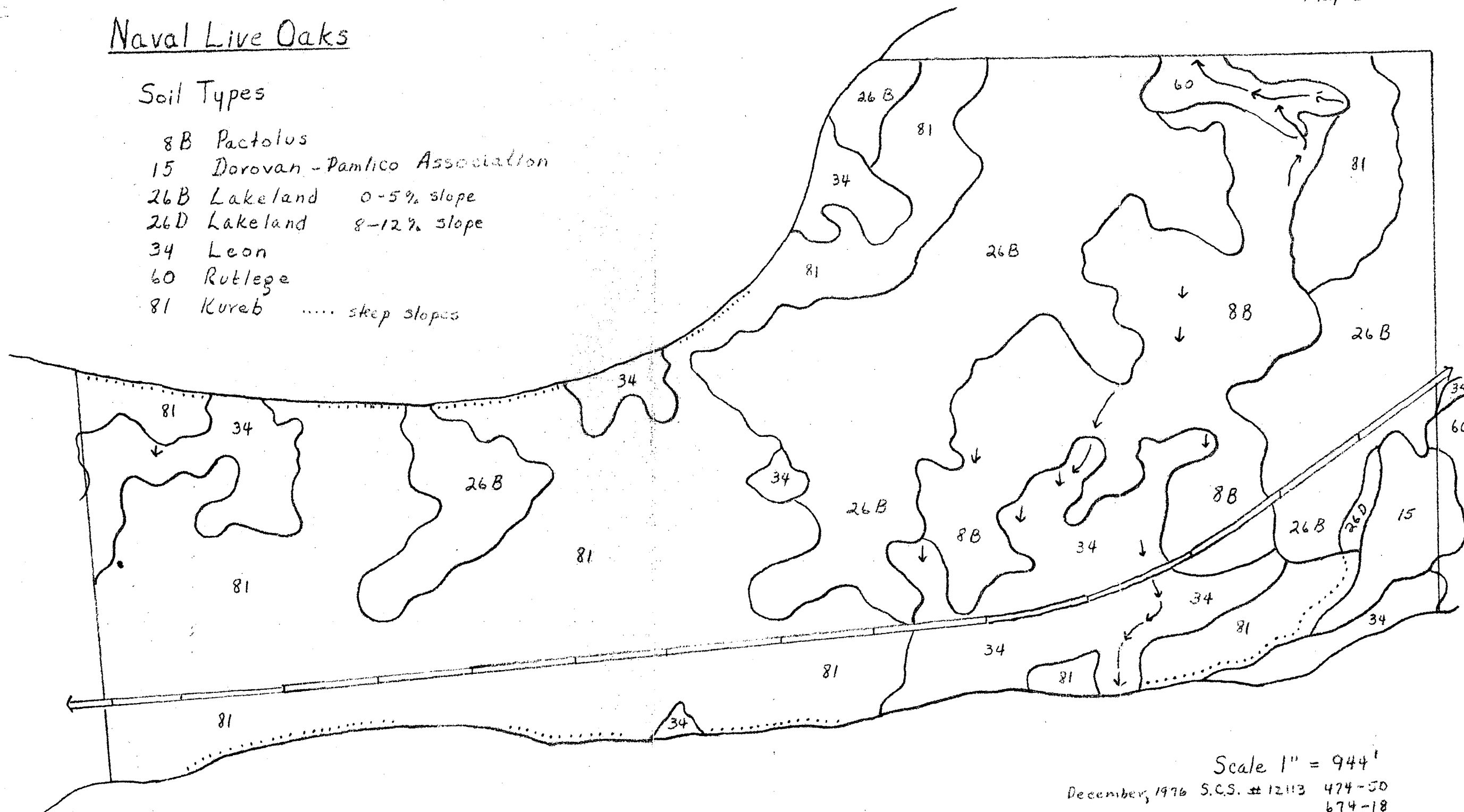
Existing Vegetation - generalized  
January, 1977



Naval Live Oaks

## Soil Types

- 8B Pactolus
- 15 Dorovan - Pamlico Association
- 26B Lakeland 0-5% slope
- 26D Lakeland 8-12% slope
- 34 Leon
- 60 Rutledge
- 81 Kureb ..... steep slopes



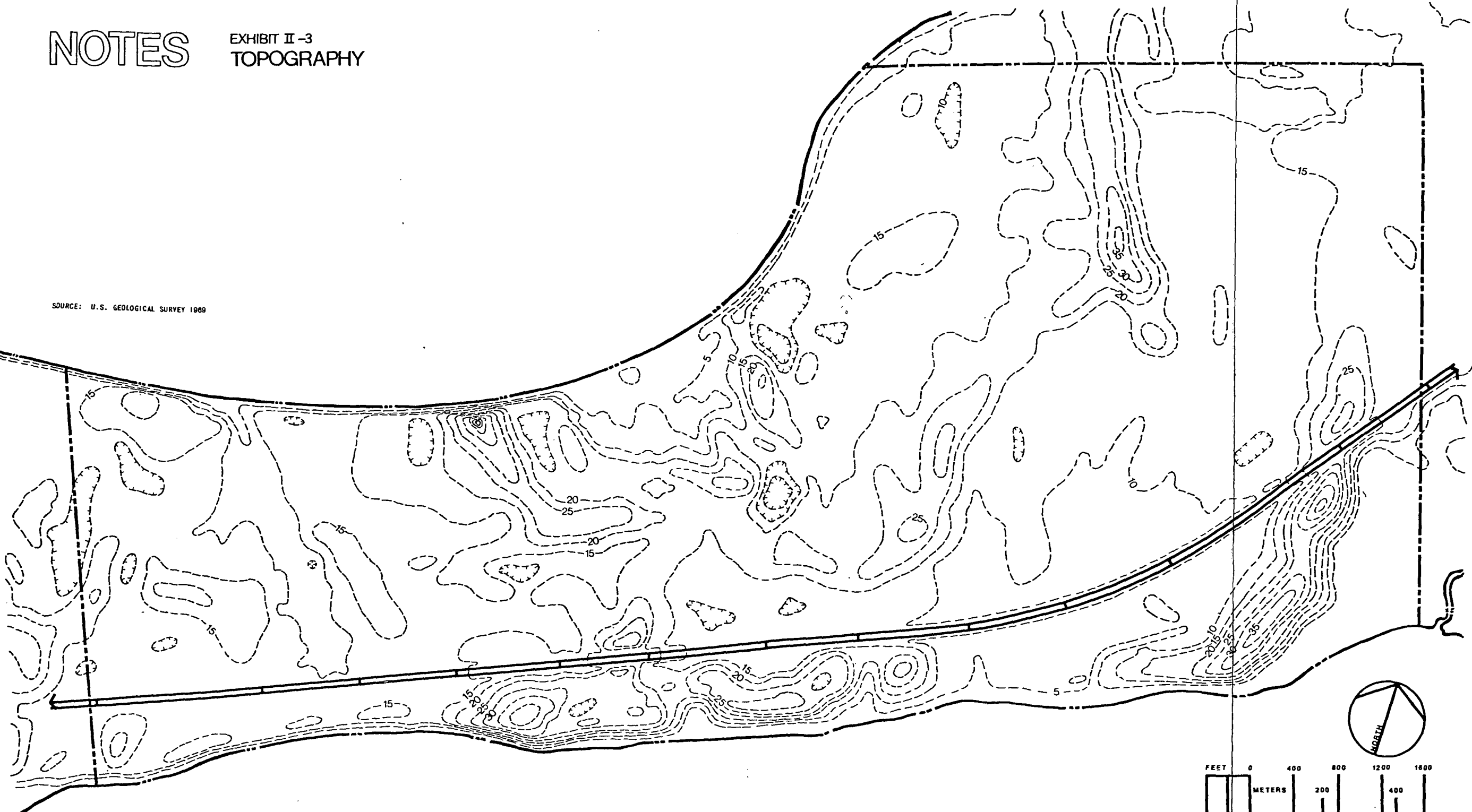
Scale 1" = 944'

December, 1976 S.C.S. #12113 474-50  
674-18

# NOTES

EXHIBIT II-3  
TOPOGRAPHY

SOURCE: U.S. GEOLOGICAL SURVEY 1989



GULF ISLANDS NATIONAL SEASHORE

NAVAL

LIVE

OAKS

RESERVATION



DEVELOPMENT  
CONCEPT PLAN

620142.012  
DCL JUNE 76

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

ON MICROFILM