

An aerial photograph of a coastal wetland area. A large, dark blue body of water is visible in the upper center. The surrounding land is a mix of reddish-brown and dark blue/purple, indicating different vegetation or soil types. The text is overlaid on the image.

Florida Plant Communities on Aerial Photographs

**Department of Environmental
Protection**

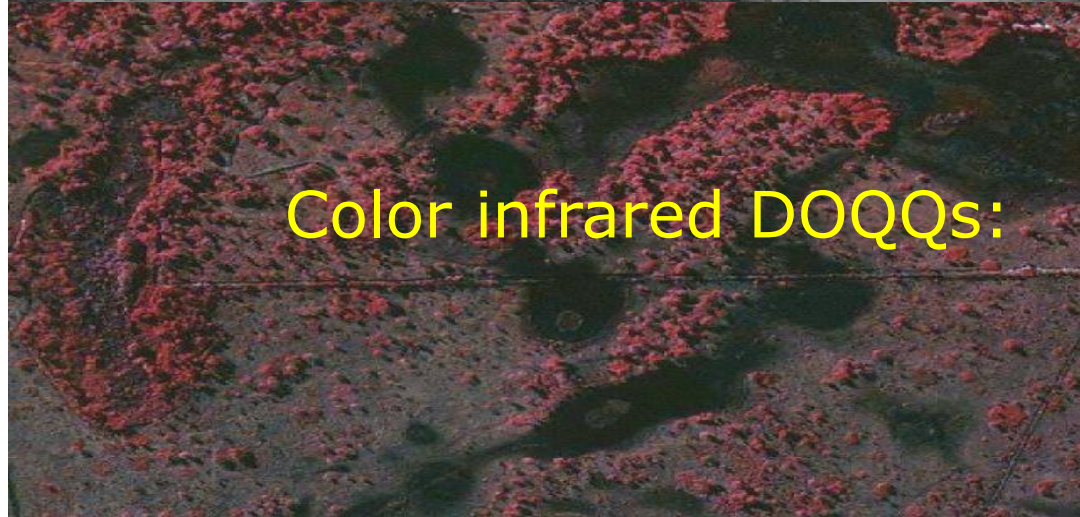
Types of Aerial Photographs



Bluelines:



Black-and-white:



Color infrared DOQQs:

An aerial photograph of a suburban area. In the foreground, there are several houses with dark roofs and light-colored walls. A road runs diagonally across the middle of the image. To the right of the road, there is a large, dense area of trees. In the bottom left corner, there is a large, dark, oval-shaped pond. The overall scene is a typical suburban landscape.

Sources for Aerial Photographs

- **Bluelines:** county property appraisers
- Often at 1 inch to 200 feet (1:2400)
- Updated frequently

Sources for Aerial Photographs

- **Black and white:** Florida Department of Transportation

- 1960s-present, updated frequently

- Flown at 1:23,000

- Enlargements to about 1:500

- First copy free

Call 850-488-2250

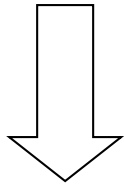
Sources for Aerial Photographs

- **Color infrared:** U.S. Geological Survey: Digital orthophoto quarter quads (DOQQs)
- 1994 and 1999, updated every 5 years
- 1-meter resolution
- Rectified for use with GIS
- Data layer in the FDEP GIS library

Questions about FDEP DOQQs? See
<http://depnet/bisnet/bisgis/index.htm>

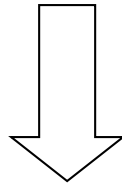
DOQQs

IR



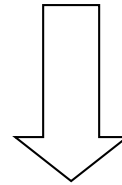
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R



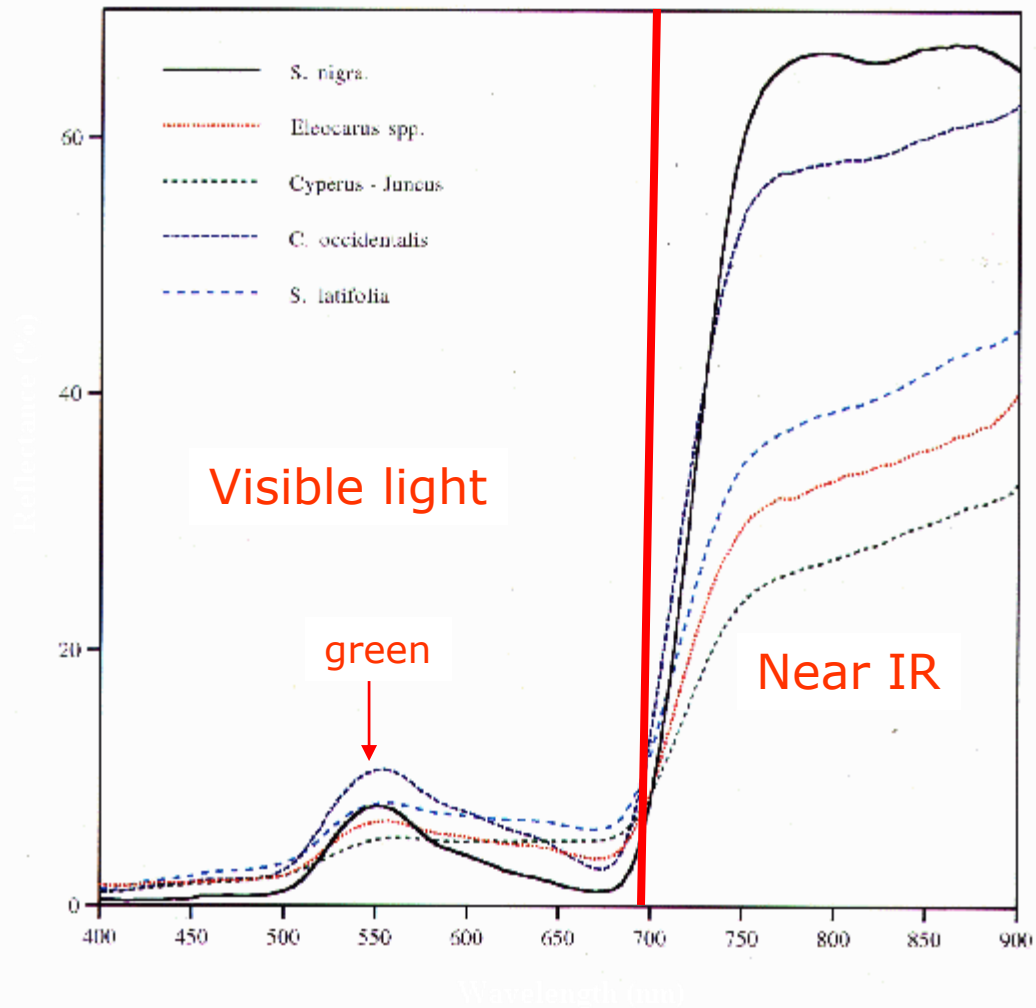
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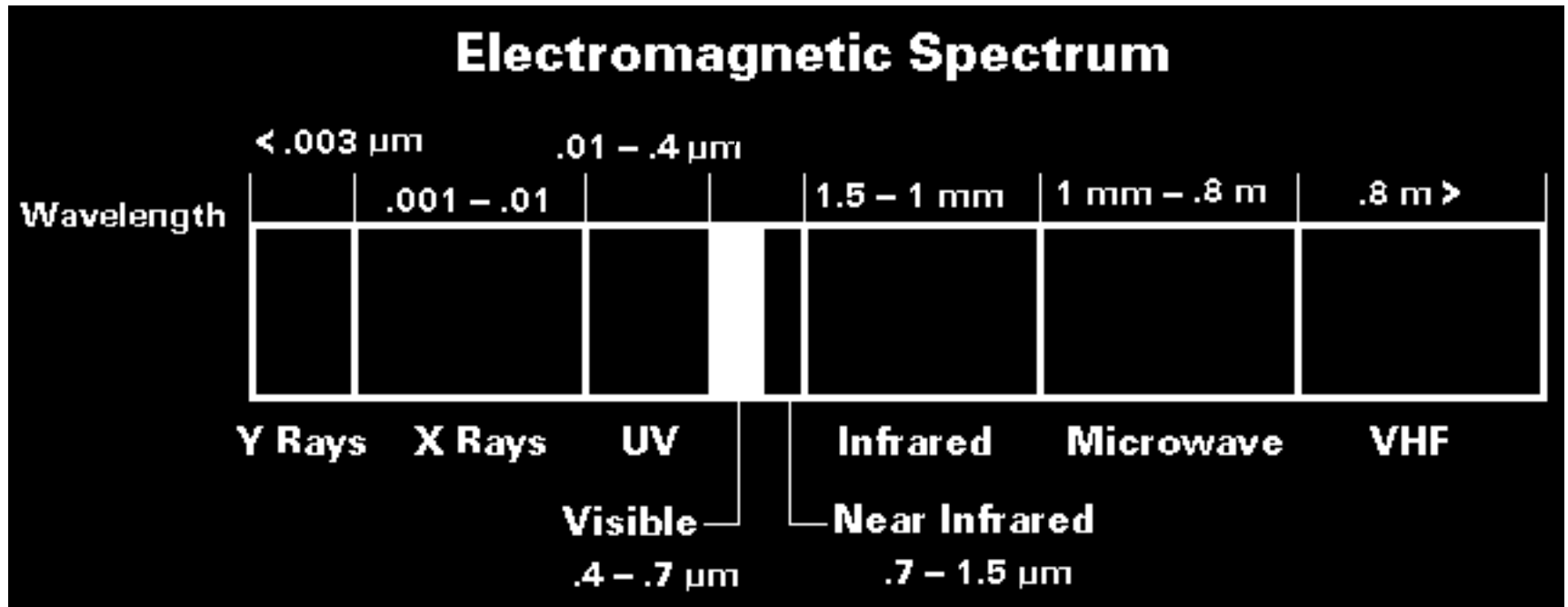


B

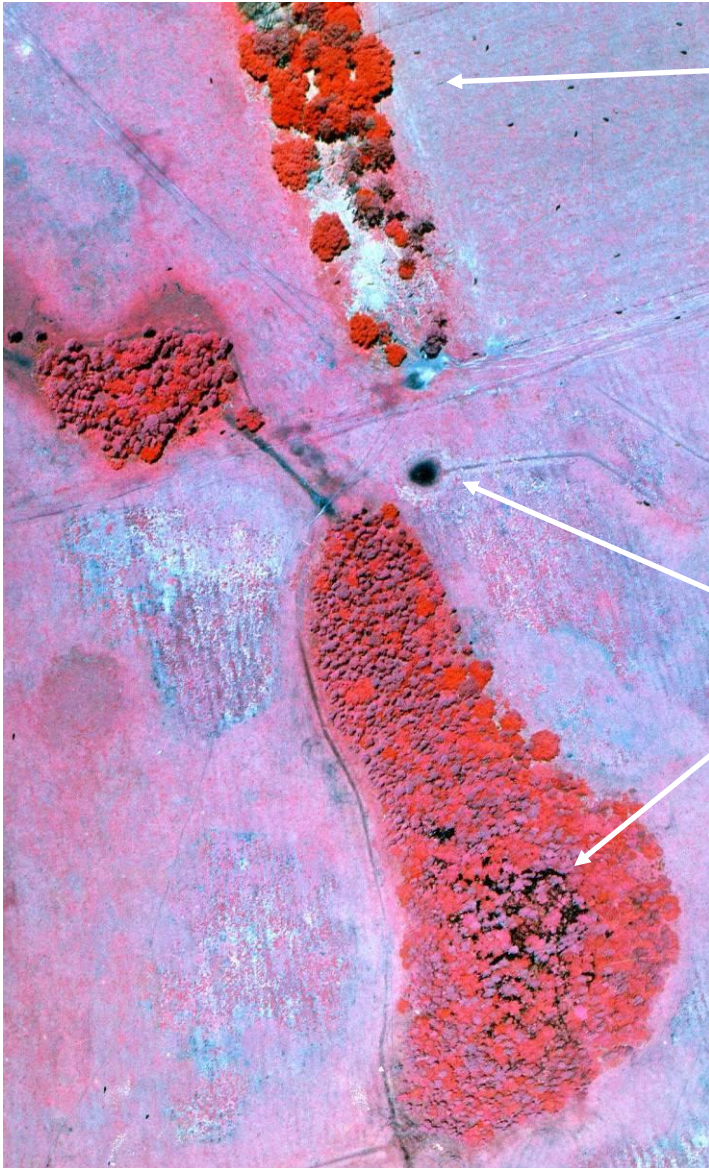
DOQQs



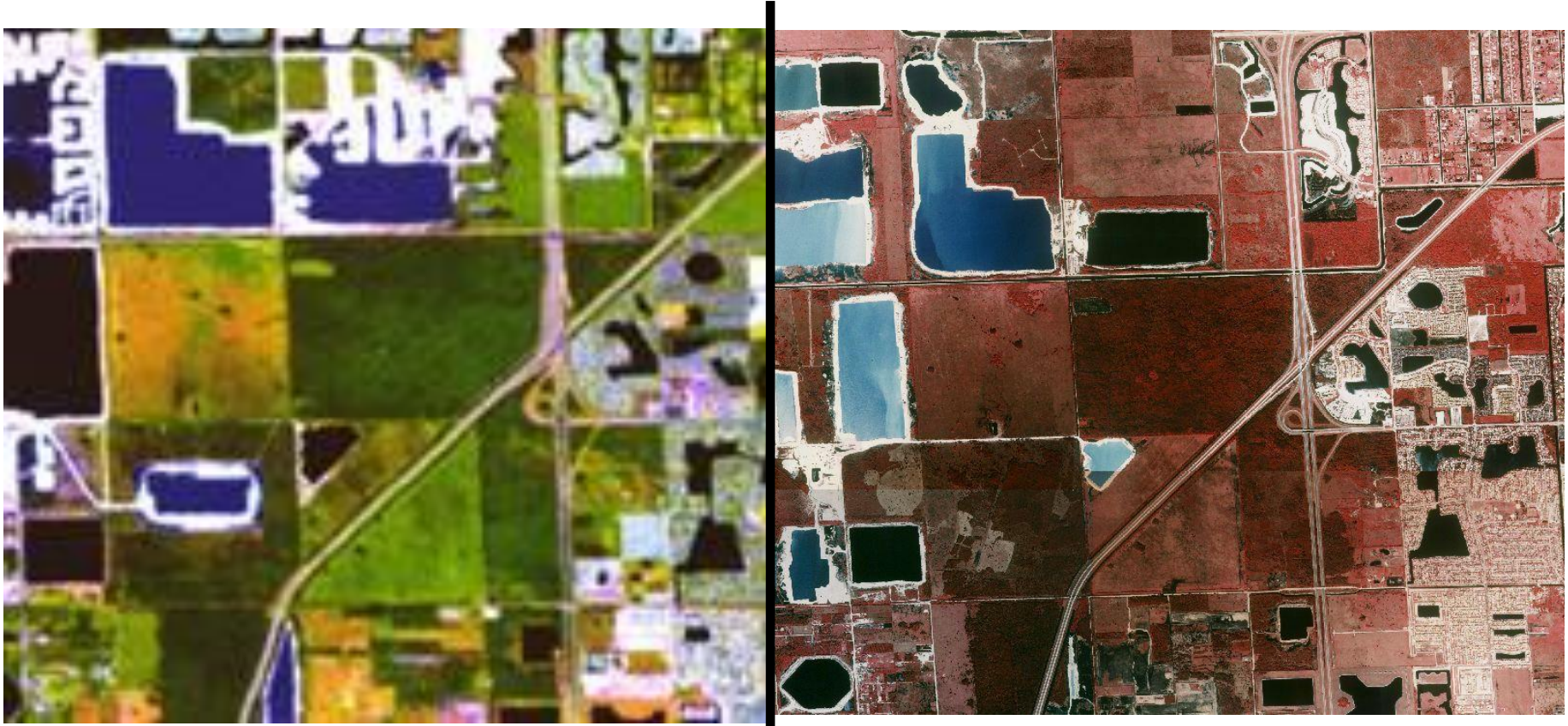
How DOQQs Work



False-Color DOQQs



Infrared Images

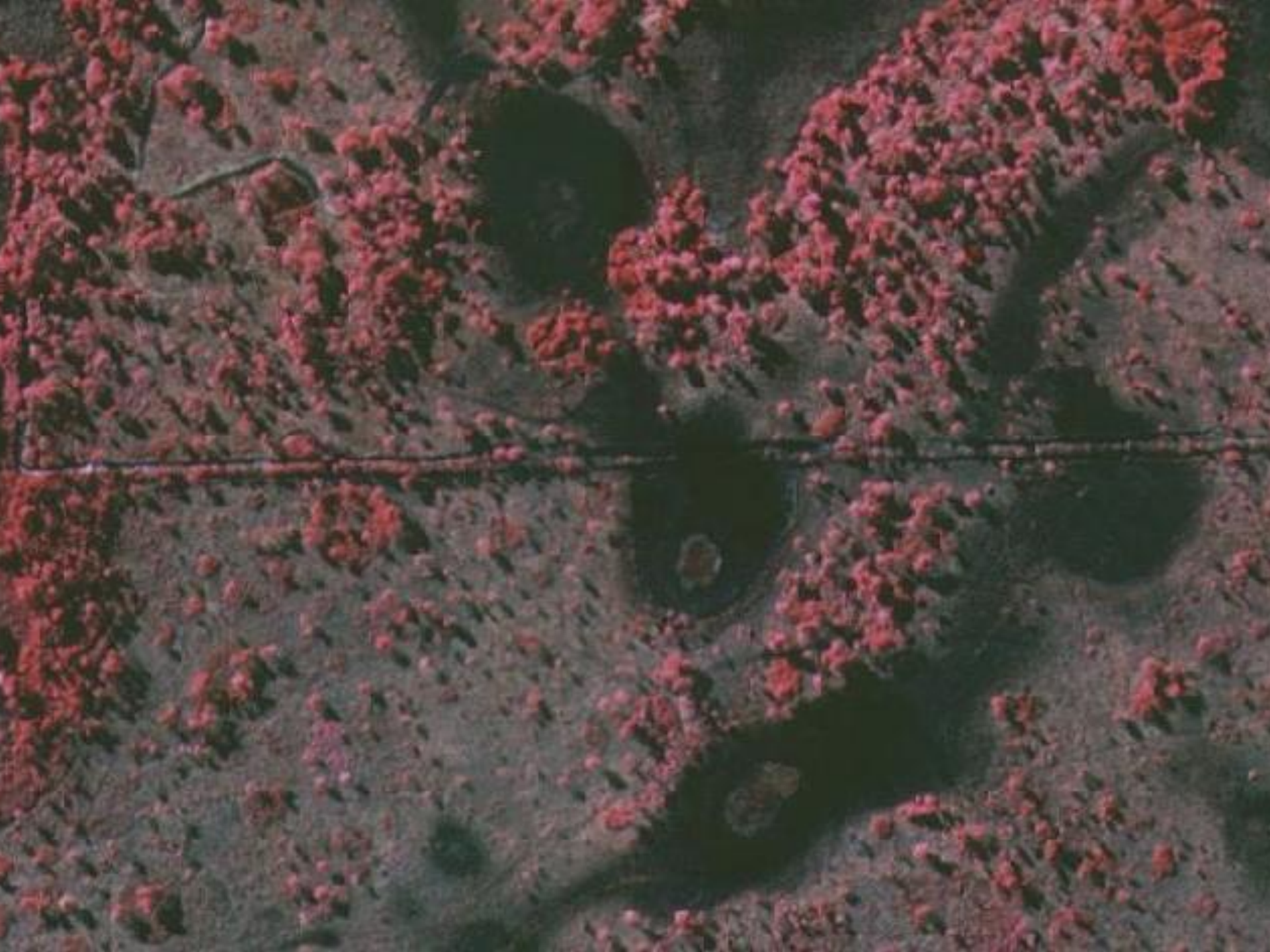


Depression Marshes:
Buttonbush, fire flag, pickerelweed, St. Johns wort,
maidencane, blue maidencane, bushy broom grass

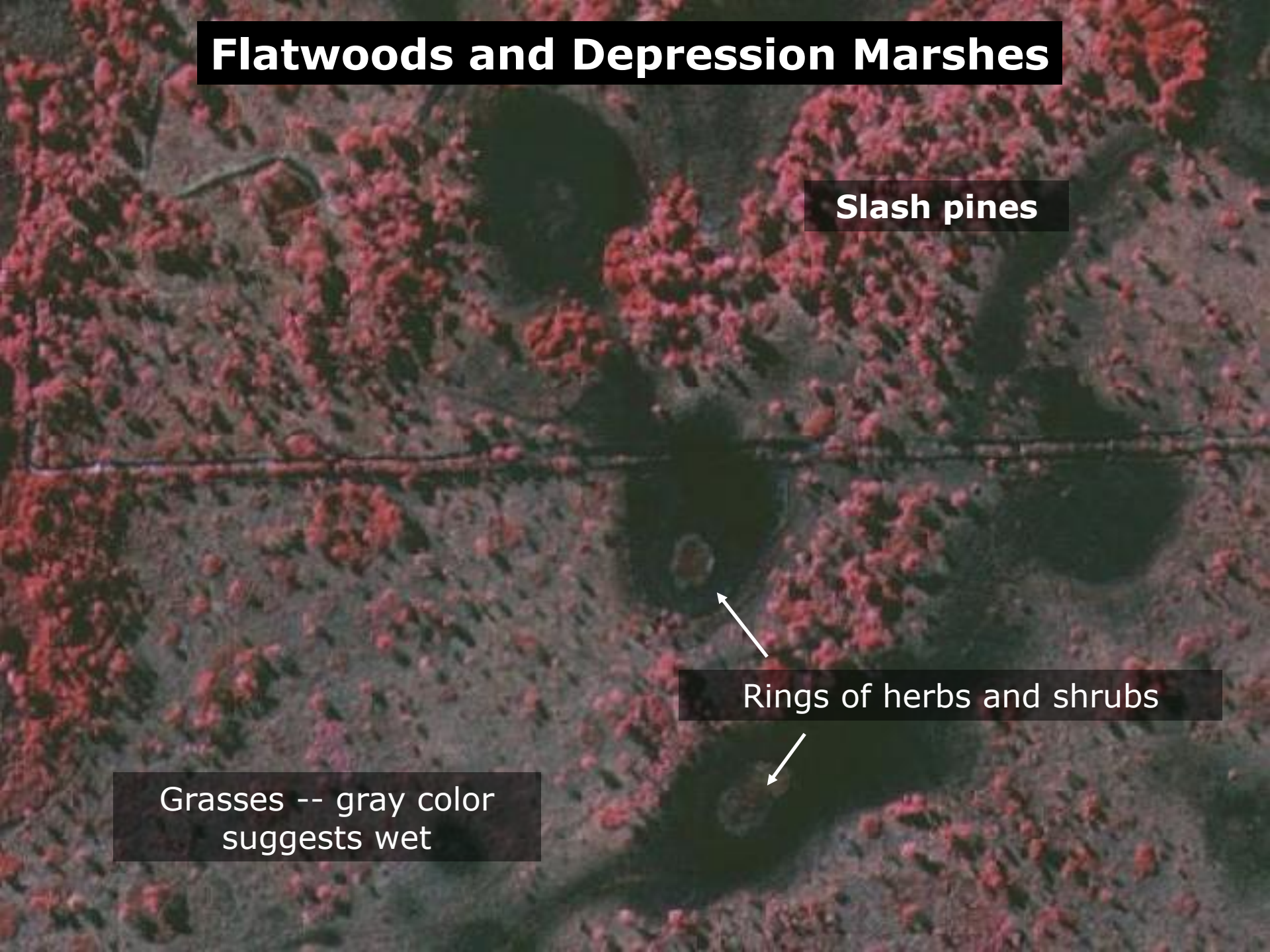


Pine Flatwoods - Note the canopy of widely spaced pines and the ground cover of saw palmetto and wiregrass. This flatwoods is an UPLAND with non-hydric soils and upland vegetation.





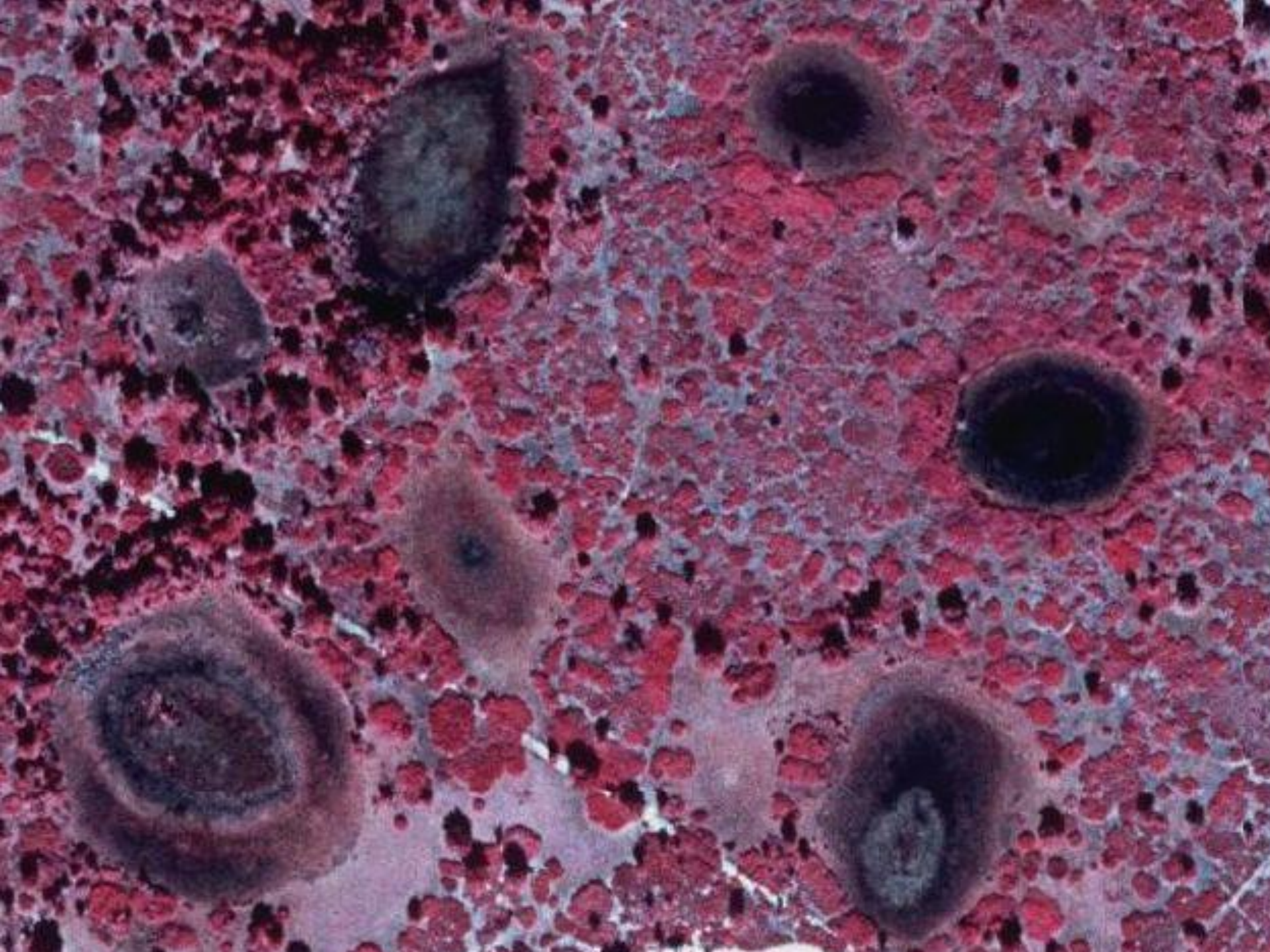
Flatwoods and Depression Marshes

An aerial photograph of a wetland landscape, likely a flatwood or depression marsh. The terrain is characterized by a mosaic of different vegetation types. Large, irregular patches of reddish-brown color dominate the upper and right portions of the image, representing slash pine stands. Interspersed among these are smaller, darker, and more textured areas. A prominent horizontal line, possibly a road or canal, runs across the middle of the image. In the lower-left and lower-right areas, there are patches of grayish-brown color, which the text identifies as grasses. Two specific features are highlighted with white arrows: one points to a small, circular, darker patch in the lower-middle, identified as a ring of herbs and shrubs, and another points to a similar but slightly larger patch just below it.

Slash pines

Rings of herbs and shrubs

Grasses -- gray color
suggests wet



Flatwoods and Depression Marshes

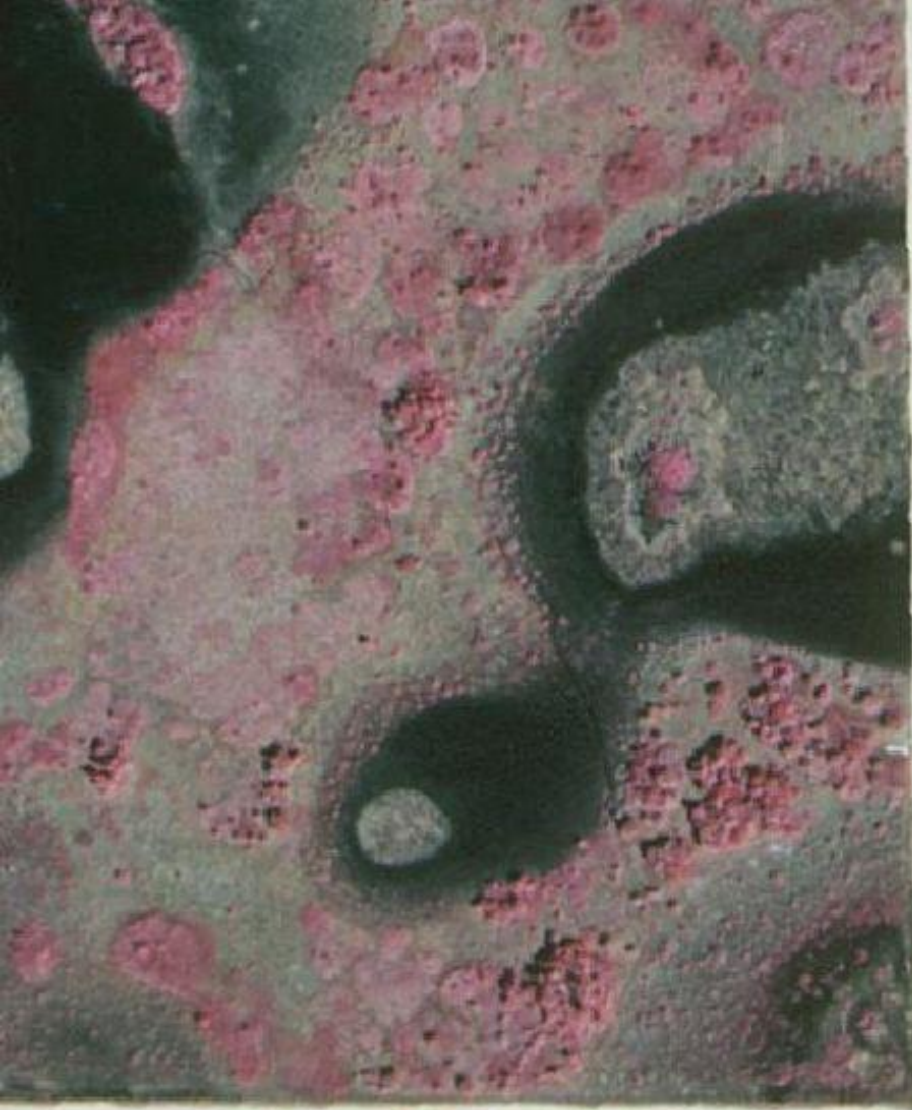
Shadow

Saw palmetto pinkish,
in "fungus" patterns

Rings of herbs and shrubs

Grasses





Flatwoods and Depression Marshes

Saw palmetto pinkish, in "fungus" patterns

Rings of herbs and shrubs

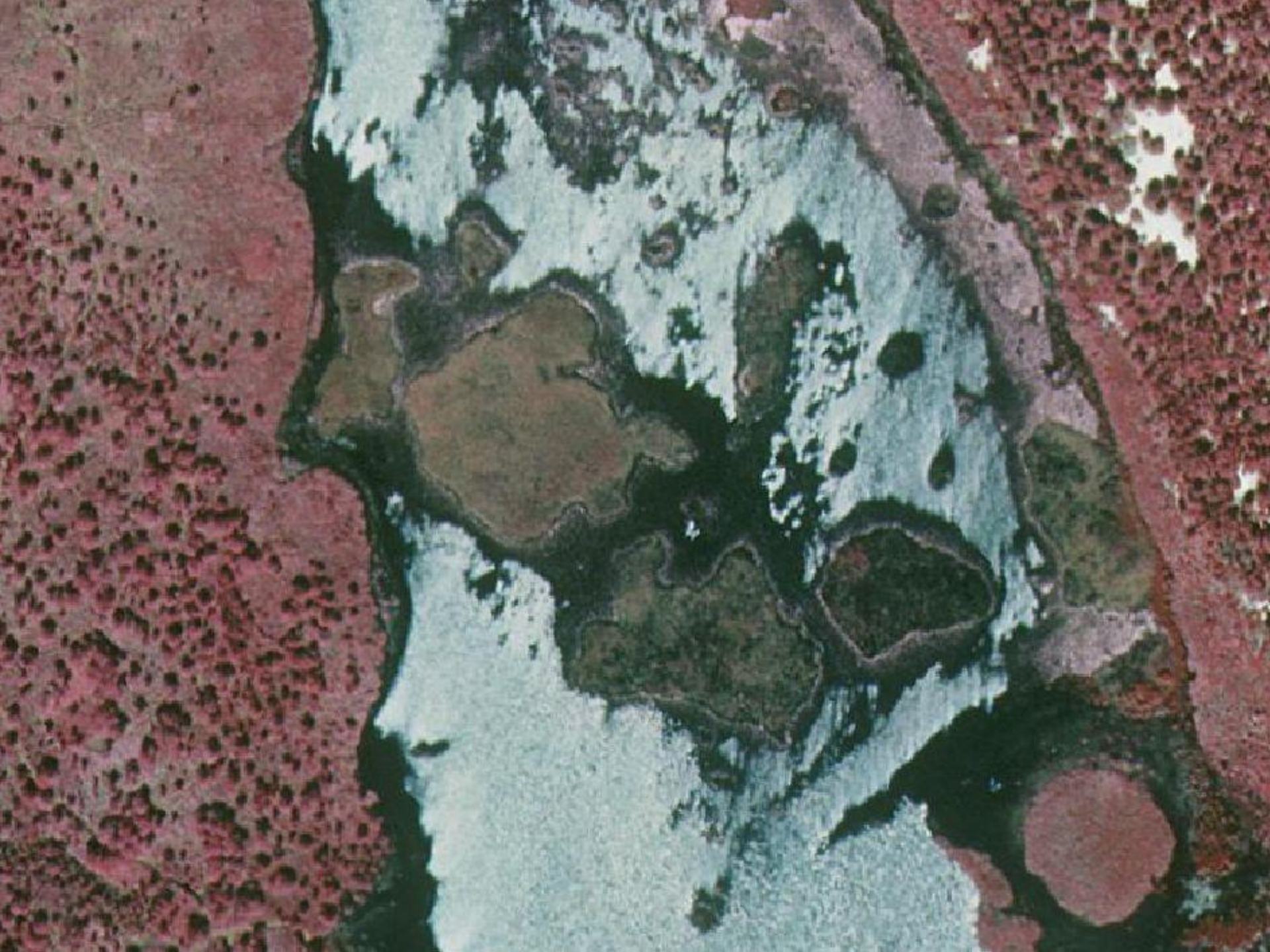
Ditch

Dry marsh

Grasses and sedges--gray suggests wet

Pasture grasses--smooth, pink





Savannas State Preserve

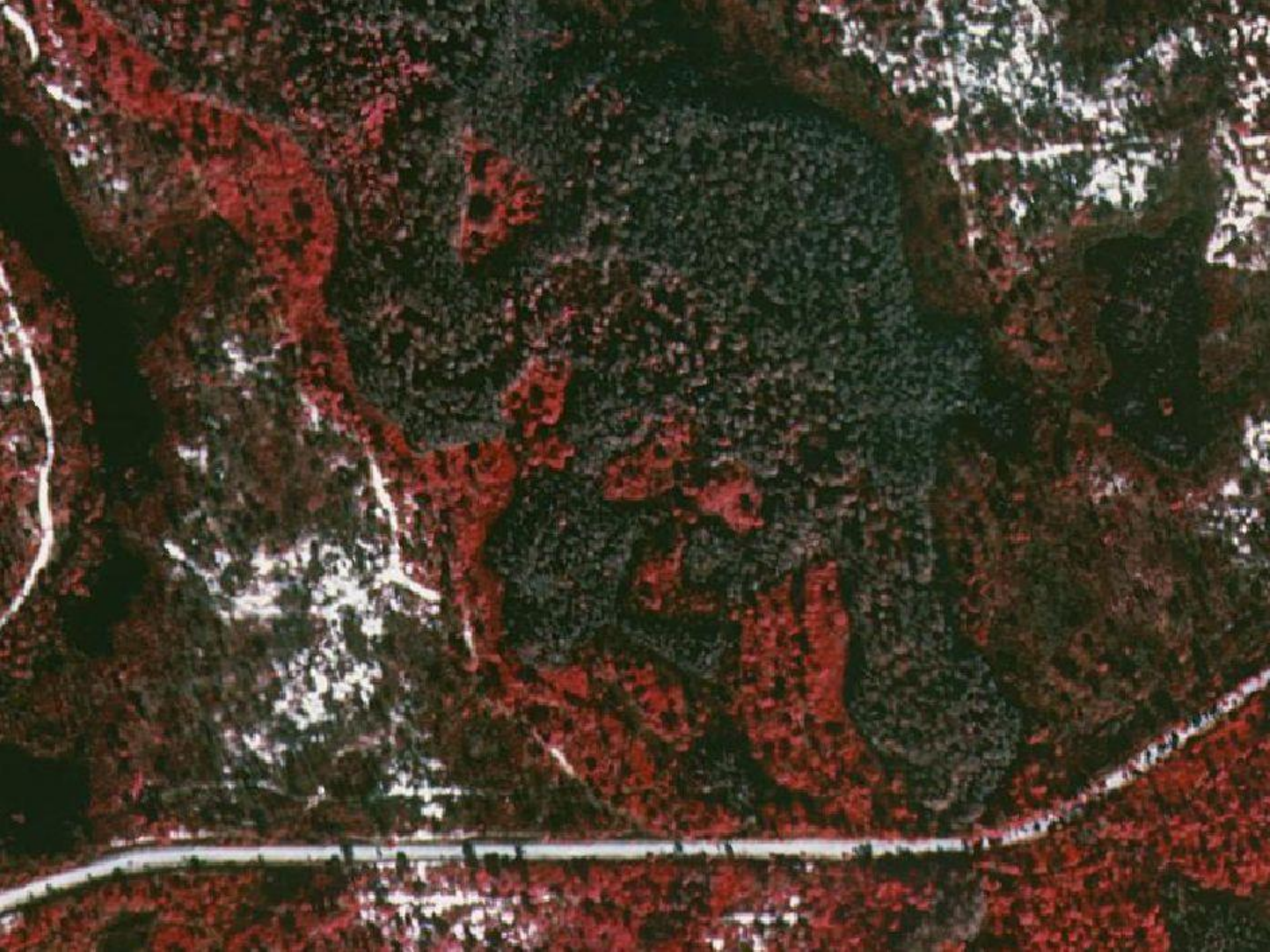
An aerial photograph of a wetland area, likely a coastal plain. The image shows a complex mosaic of different habitats. A large, irregularly shaped area in the center is a mix of dark green, brown, and light blue, indicating water and various plant life. This central area is surrounded by a wide, light blue-grey band, which is a mix of water and sediment. The outer edges of the image are a deep red-brown color, representing a different type of land cover. The overall pattern is highly textured and varied in color.

Water (specular reflection)

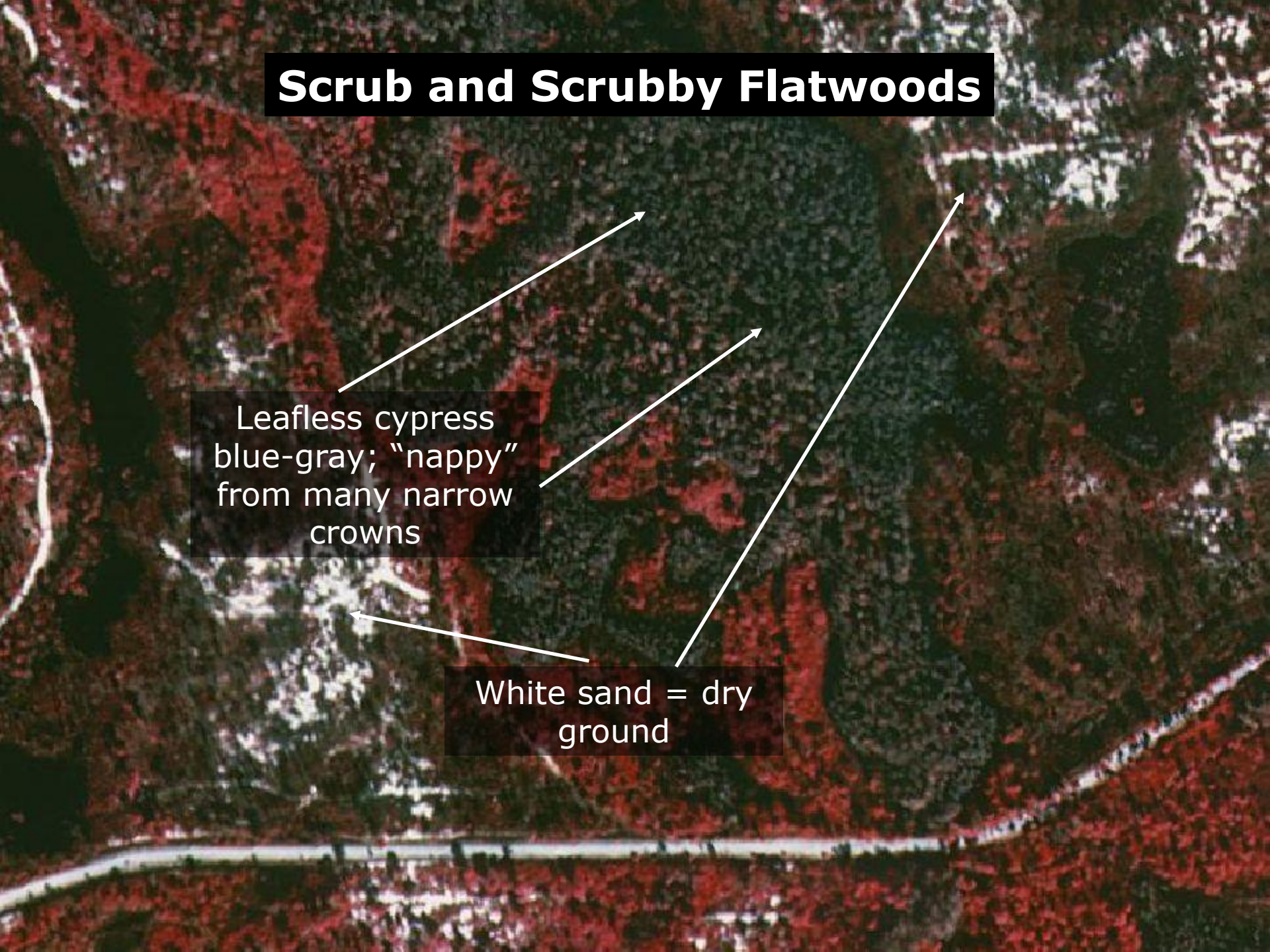
Sand pine-scrub

Sawgrass

Slash pine-palmetto flatwoods



Scrub and Scrubby Flatwoods



Leafless cypress
blue-gray; "nappy"
from many narrow
crowns

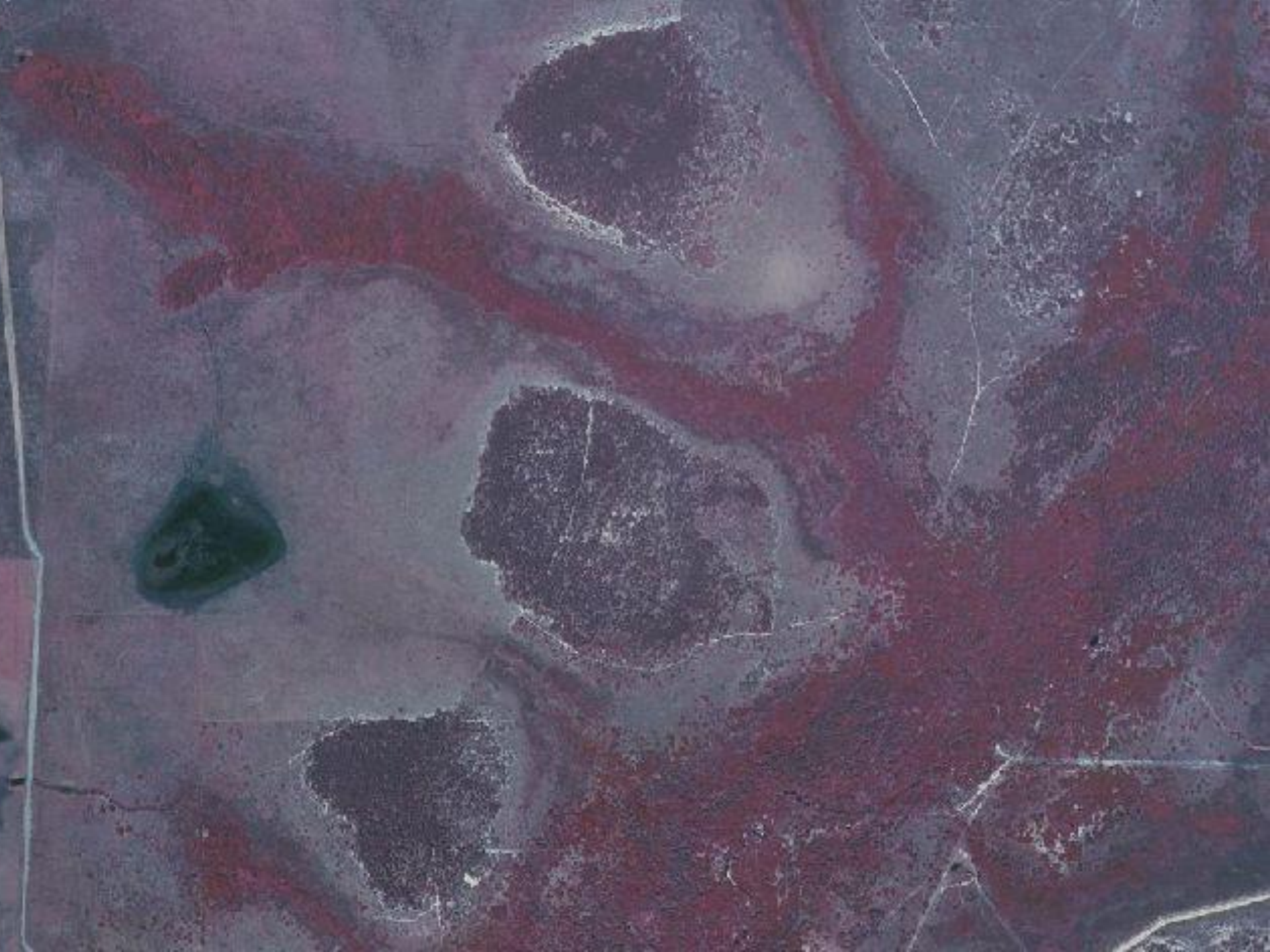
White sand = dry
ground

A photograph of a dense forest, likely an oak hammock, featuring numerous tall, slender tree trunks and a thick undergrowth of palm-like plants. Sunlight filters through the canopy, creating dappled light on the forest floor.

Oak Hammock, an upland



Scrub on dry, well drained sandy soils.

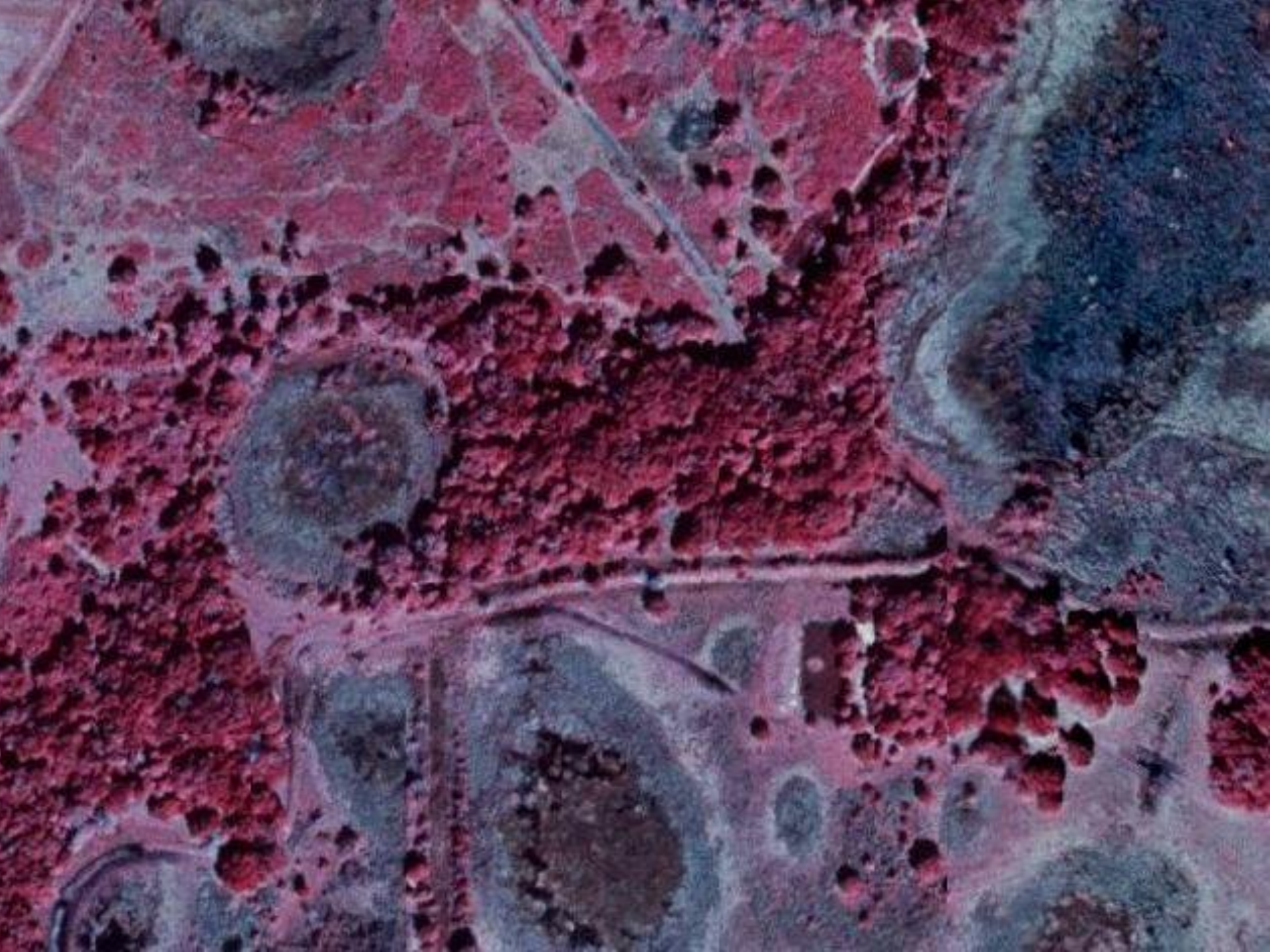


Scrub and Scrubby Flatwoods

White sand visible;
oaks dark red

Oak hammocks along
streams



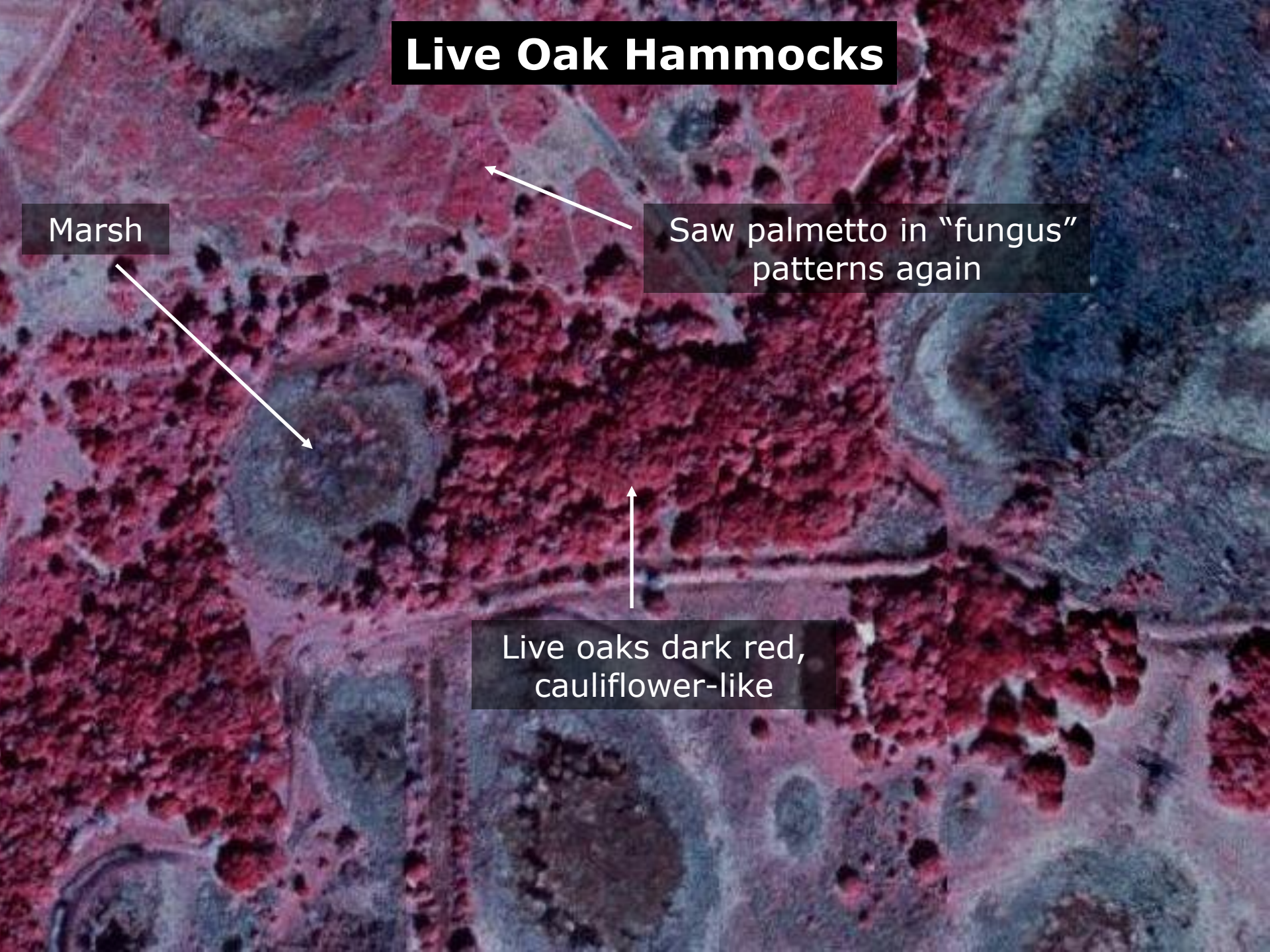


Live Oak Hammocks

Marsh

Saw palmetto in "fungus" patterns again

Live oaks dark red, cauliflower-like



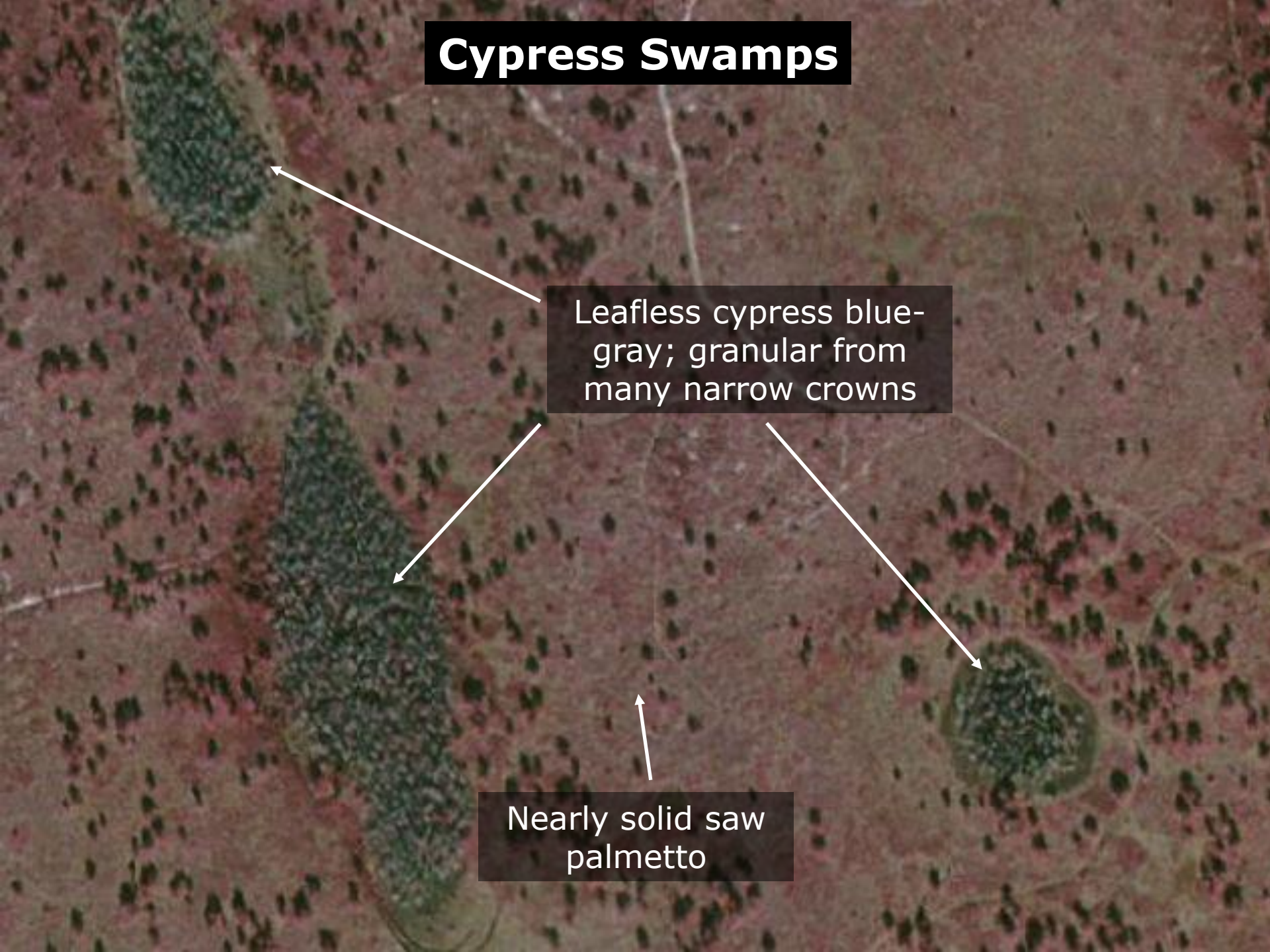




Cypress Swamps

Leafless cypress blue-gray; granular from many narrow crowns

Nearly solid saw palmetto



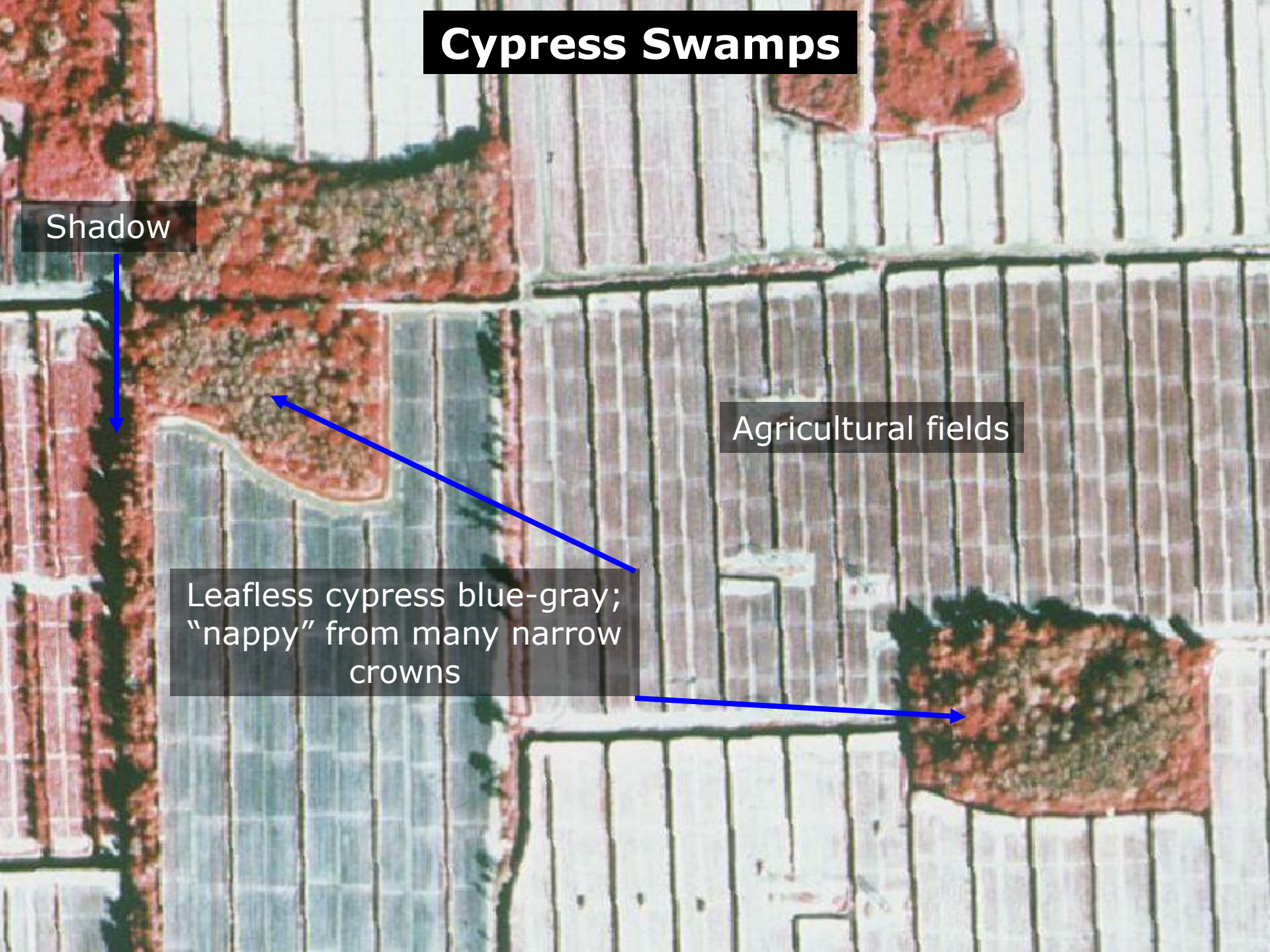


Cypress Swamps

Shadow

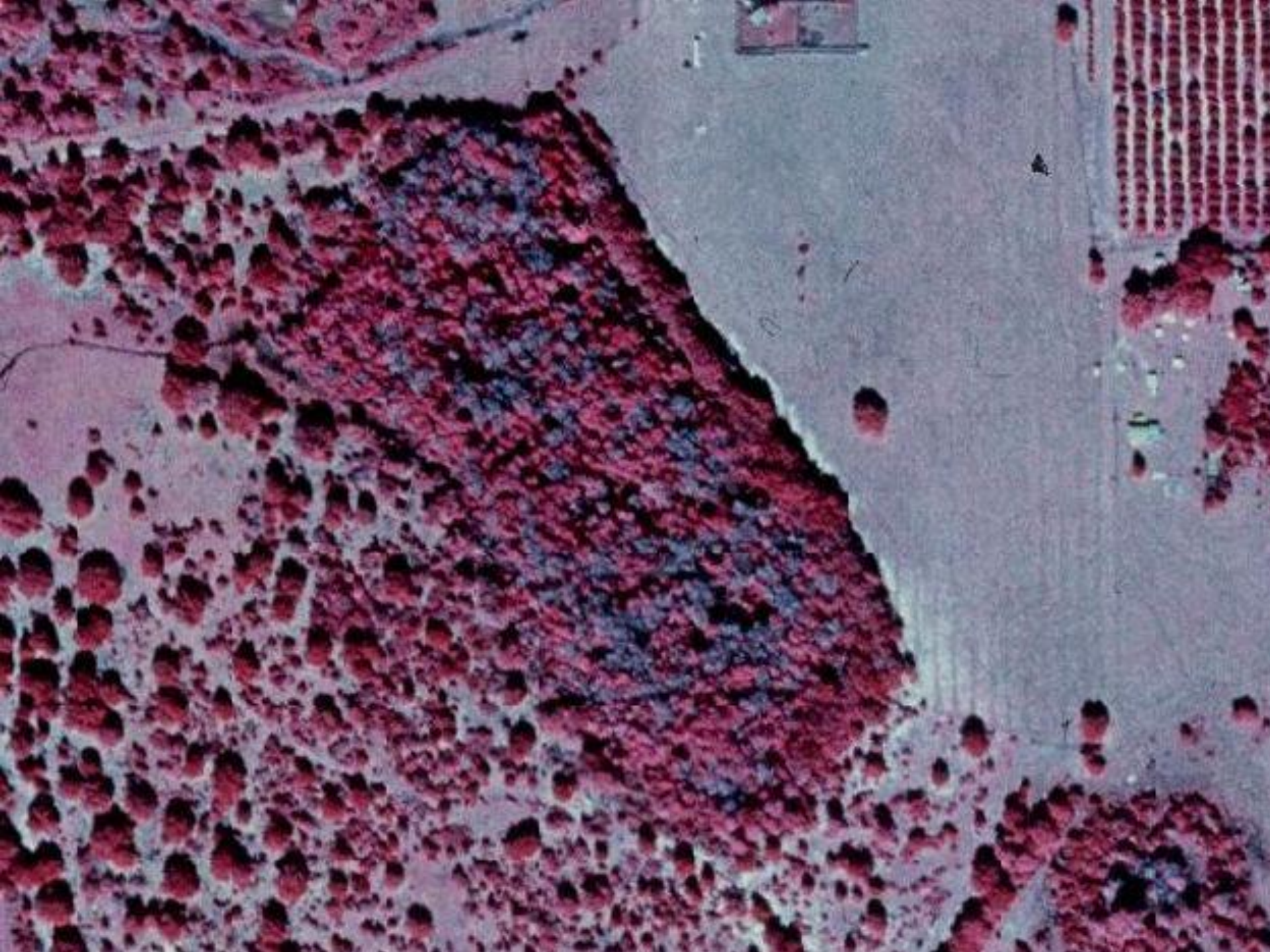
Agricultural fields

Leafless cypress blue-gray;
"nappy" from many narrow
crowns

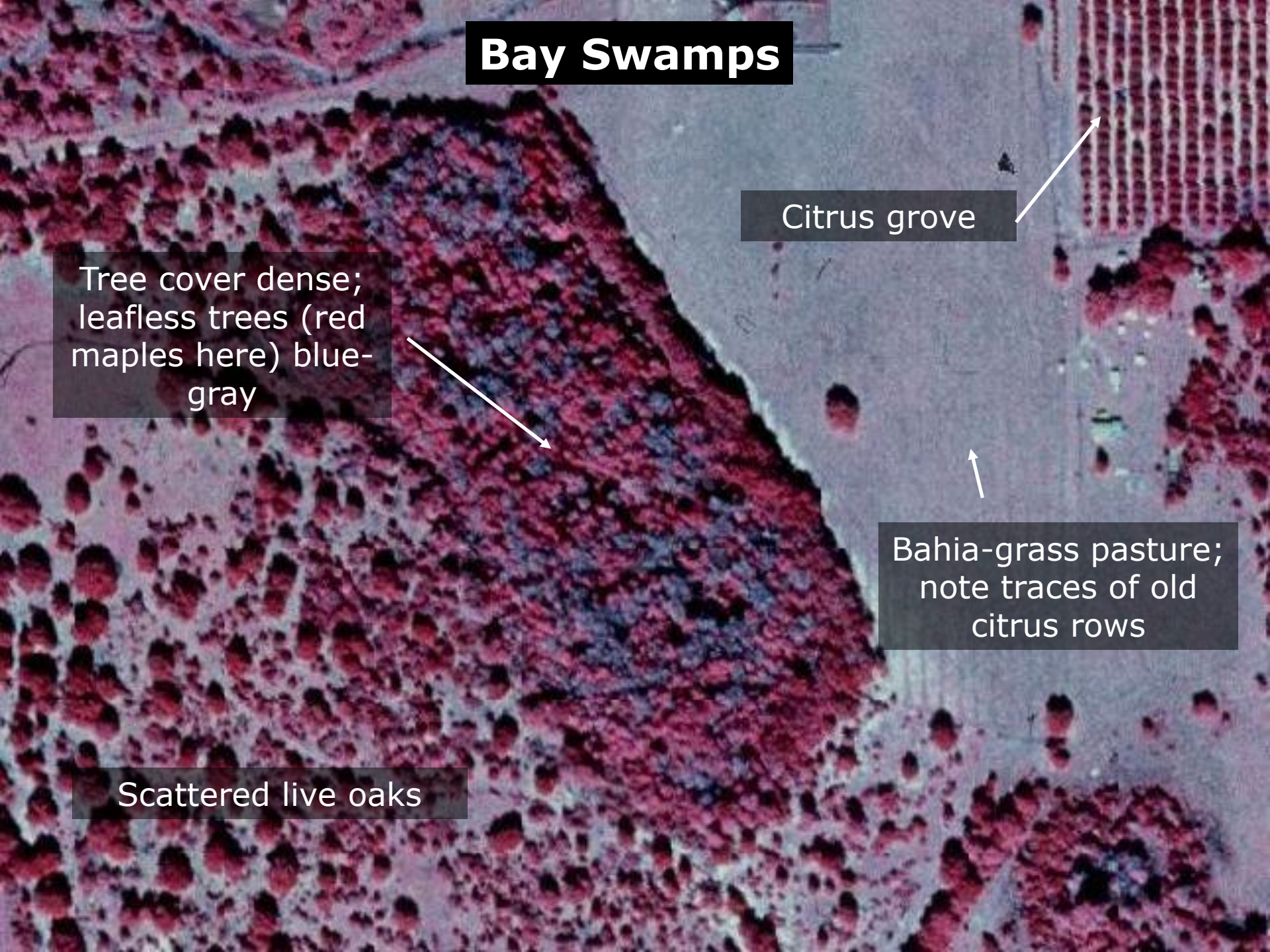


Bay Swamps / Mixed Hardwood Swamps





Bay Swamps

An aerial photograph showing a coastal area. On the left, there is a dense forest of trees, mostly red in color, with some blue-gray patches. A white arrow points from a text box to this forest. In the center, there is a large, irregularly shaped area of water or a wetland, colored light blue-gray. To the right of this area, there is a large, rectangular area of land, colored light gray, which is a citrus grove. A white arrow points from a text box to this area. Below the citrus grove, there is a large, irregularly shaped area of land, colored light gray, which is a Bahia-grass pasture. A white arrow points from a text box to this area. In the bottom left corner, there is a large, irregularly shaped area of land, colored light gray, which is a scattered live oaks area. A white arrow points from a text box to this area.

Tree cover dense;
leafless trees (red
maples here) blue-
gray

Citrus grove

Bahia-grass pasture;
note traces of old
citrus rows

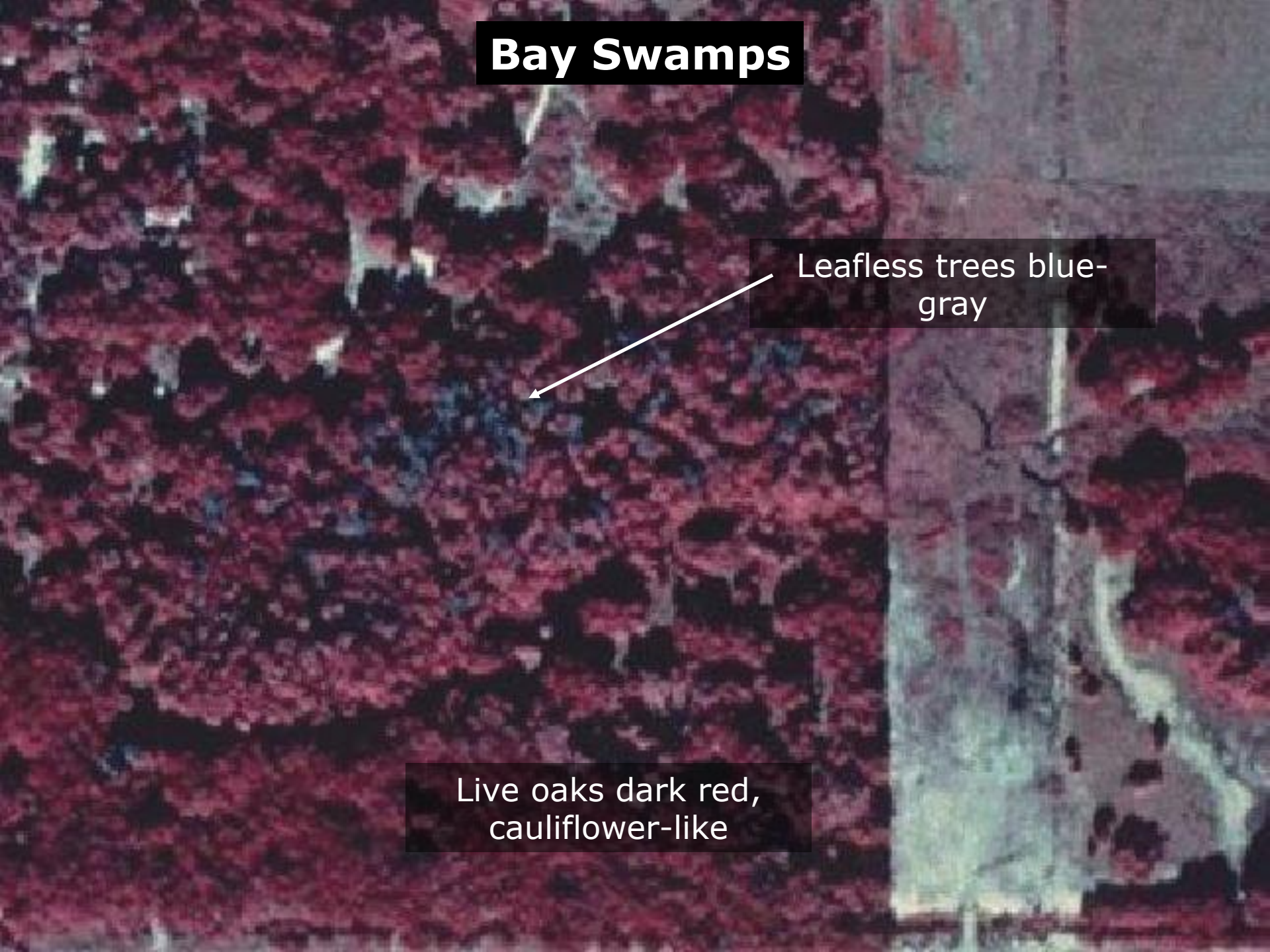
Scattered live oaks



Bay Swamps

Leafless trees blue-gray

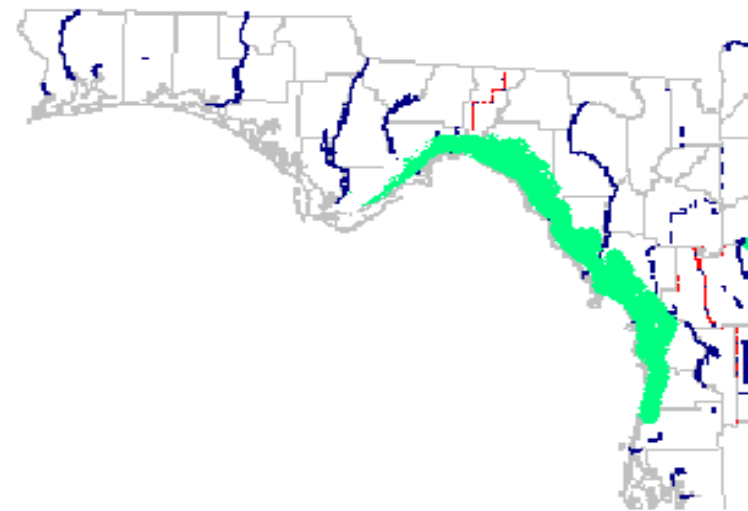
Live oaks dark red,
cauliflower-like





Hydric hammock

Are related floristically to upper zones of river swamps, often where deep groundwater seeps slowly from limestone. Soils are rich and trees are typically large. Sabal palm and red cedar are indicators. Look for live oak, swamp laurel oak, sweetgum, Fl elm, red maple, hornbeam, hackberry, magnolia.





St. Johns River Floodplain Marshes

An aerial photograph showing a river winding through a marshy landscape. The river is dark and occupies the right side of the image. The surrounding land is a mix of green, brown, and reddish-brown patches. Two white arrows point to specific areas: one points to a gray, finely patterned area in the upper left, and the other points to a reddish-brown area in the lower left. Two text boxes with black backgrounds and white text provide labels for these areas.

Gray and finely
patterned--*Spartina*
bakeri marsh

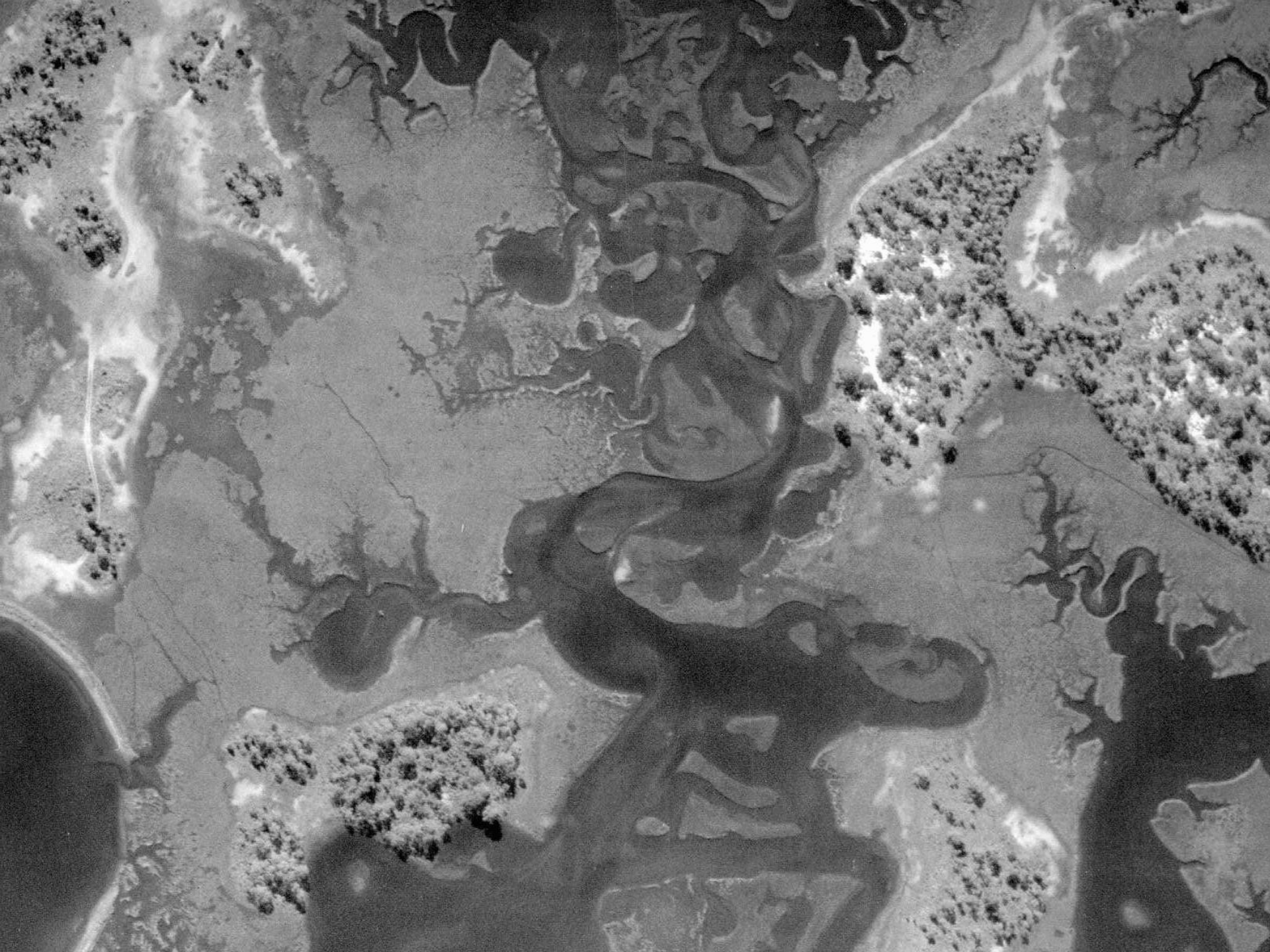
Hardwood hammock
(oaks and others) with
depression marshes



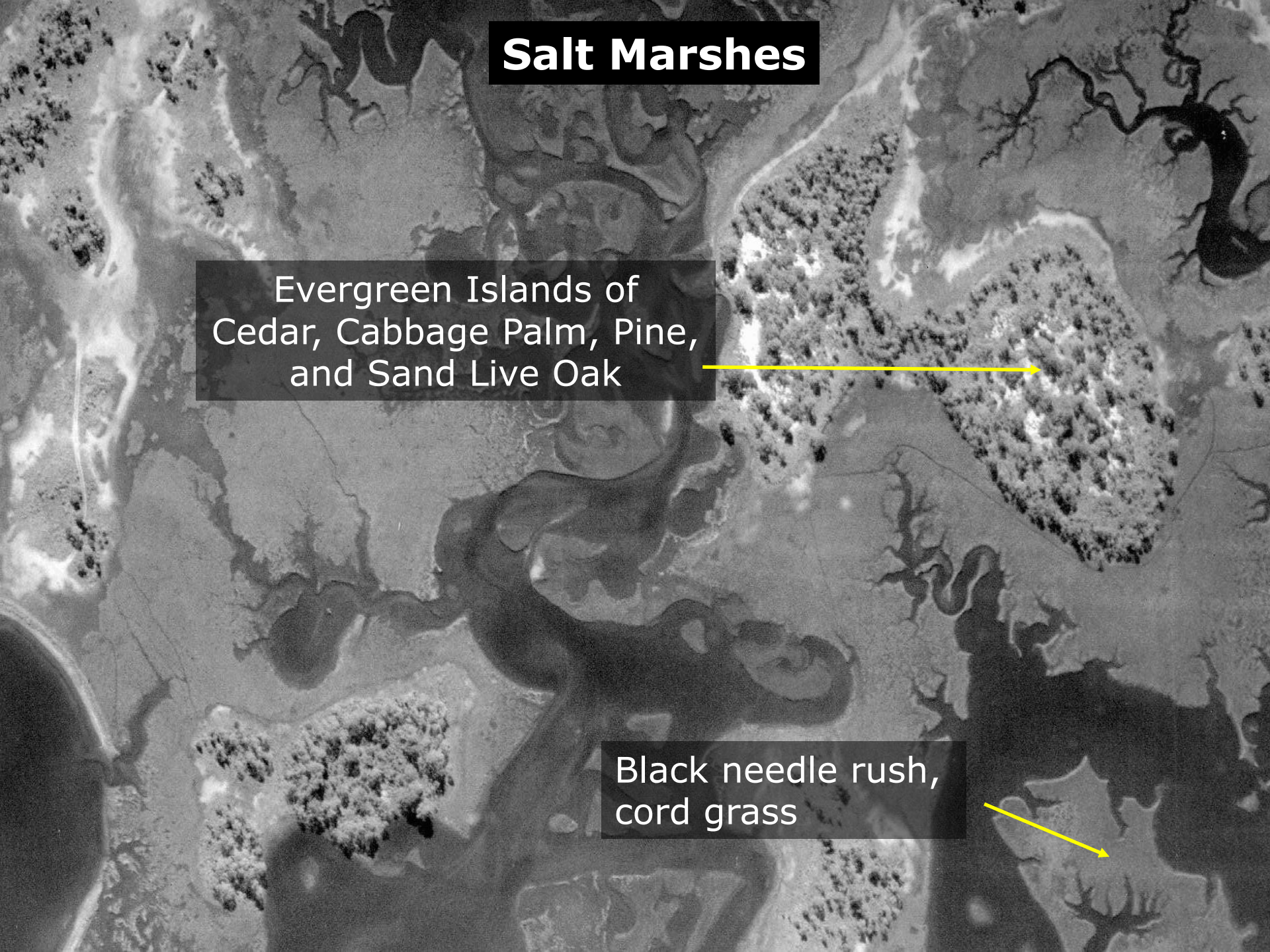
Salt Marshes:
Black needle rush, cord grasses, glass worts



Salterns, saltmarsh and tree islands, St. Marks area

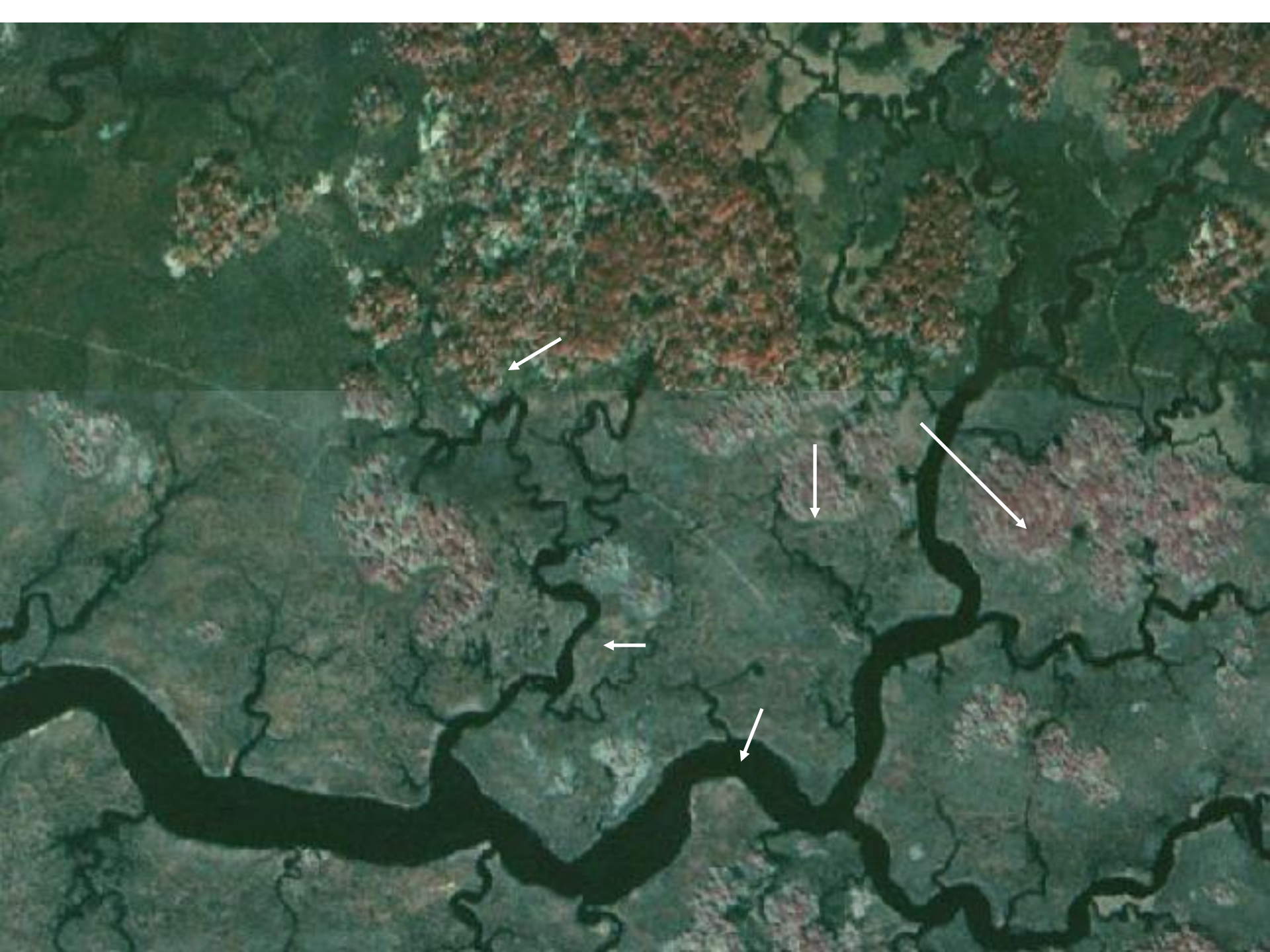


Salt Marshes

An aerial photograph of a salt marsh landscape. The image shows a complex network of water channels and islands. The vegetation is represented in different shades of gray, indicating different plant types. A yellow arrow points from a text box to a specific island, and another yellow arrow points from a text box to a specific water channel.

Evergreen Islands of
Cedar, Cabbage Palm, Pine,
and Sand Live Oak

Black needle rush,
cord grass





Islands of evergreen
trees: pine, cedar,
oak, cabbage palm

Dormant *Spartina*
and *Juncus* gray or
blue

Tightly meandering
streams



Coastal dune and interdunal wetlands



Interdunal swale or marsh, northwest Florida



Interdunal or between the dune ridges, pond. Depending on the hydroperiod you might find marshes or shallow ponds between long, linear ridges. The ridges are often dominated by sandpine scrub or coastal scrub. If the ridges are lower you might find pine flatwoods along the ridge.



Salt Marshes

An aerial photograph of a salt marsh landscape. The image shows a complex network of water bodies and land. A large, dark blue body of water is on the right side. A winding, gray stream flows through the center-left. The land is a mix of green, brown, and reddish-brown patches. A label 'Salt Marshes' is at the top. A label 'Gray, tightly wound streams--a salt marsh' points to the winding stream. A label 'Interdunal swales' points to two parallel, light-colored lines in the lower right.

Gray, tightly wound streams--a salt marsh

Interdunal swales



Bald Point, Franklin County, Florida



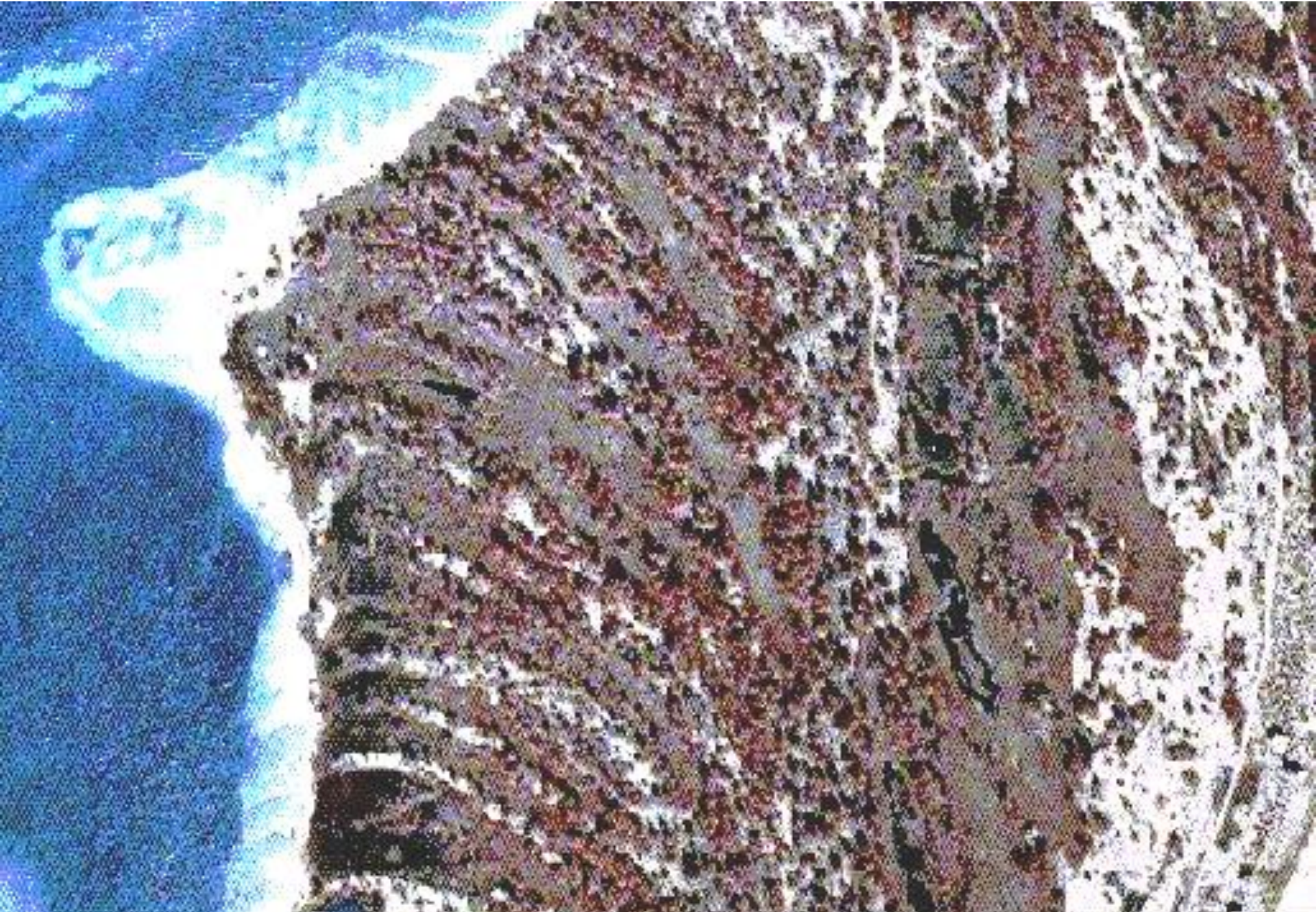
Just west of Bald Point, Franklin County, Florida



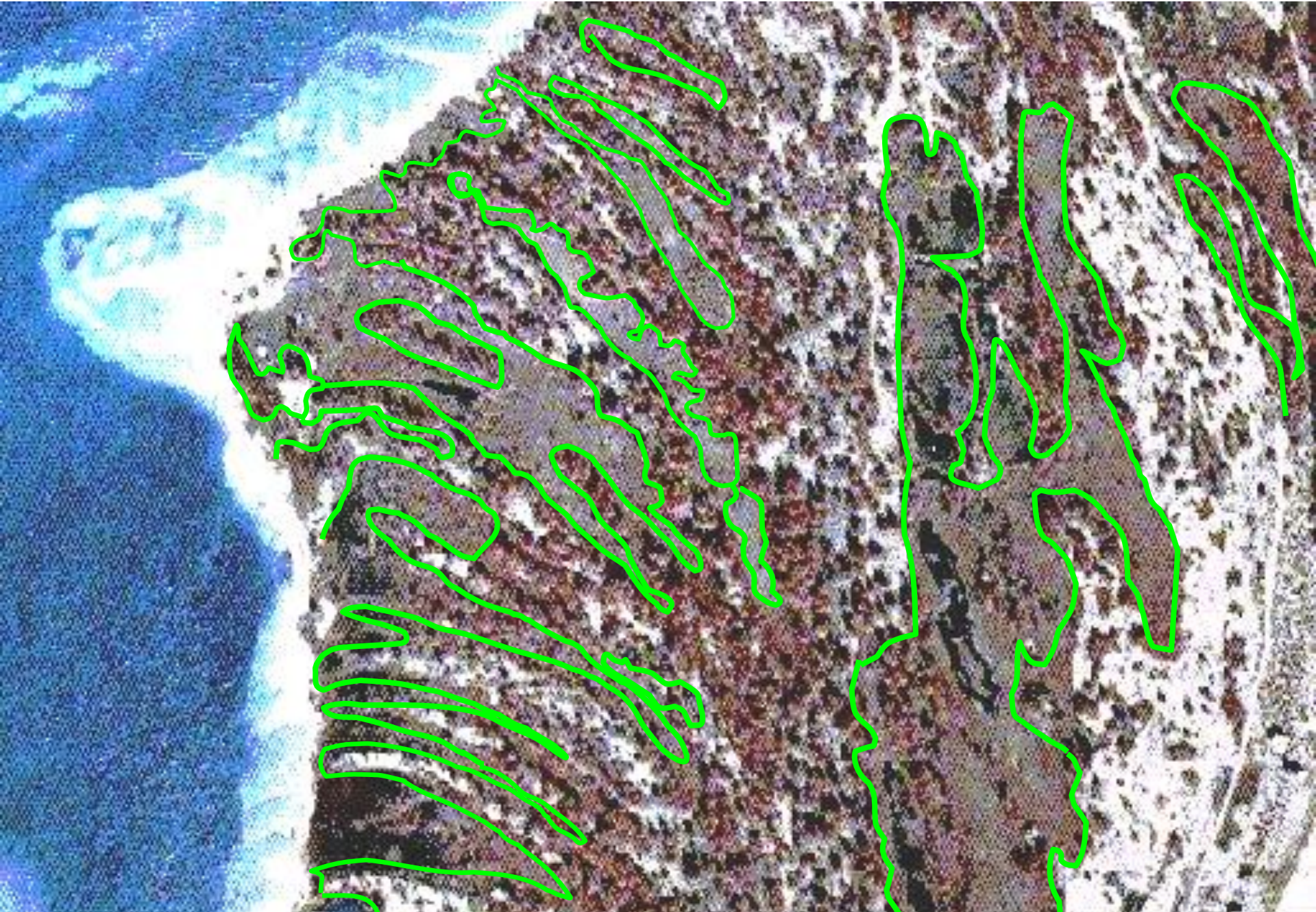
Just west of Bald Point, Franklin County, Florida

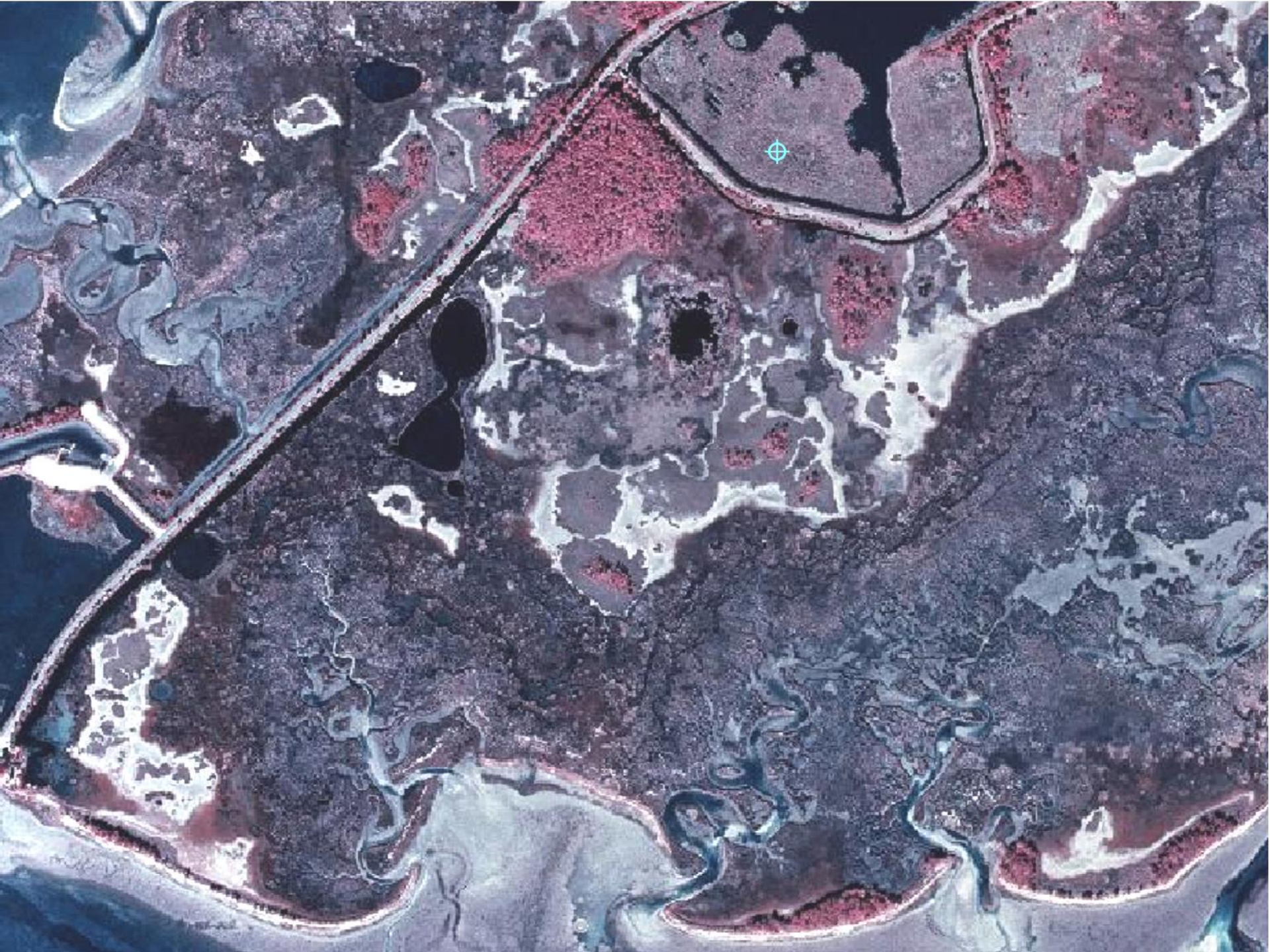


Close up of eastern end of Dog Island, Franklin Co.



Close up of eastern end of Dog Island, Franklin Co.





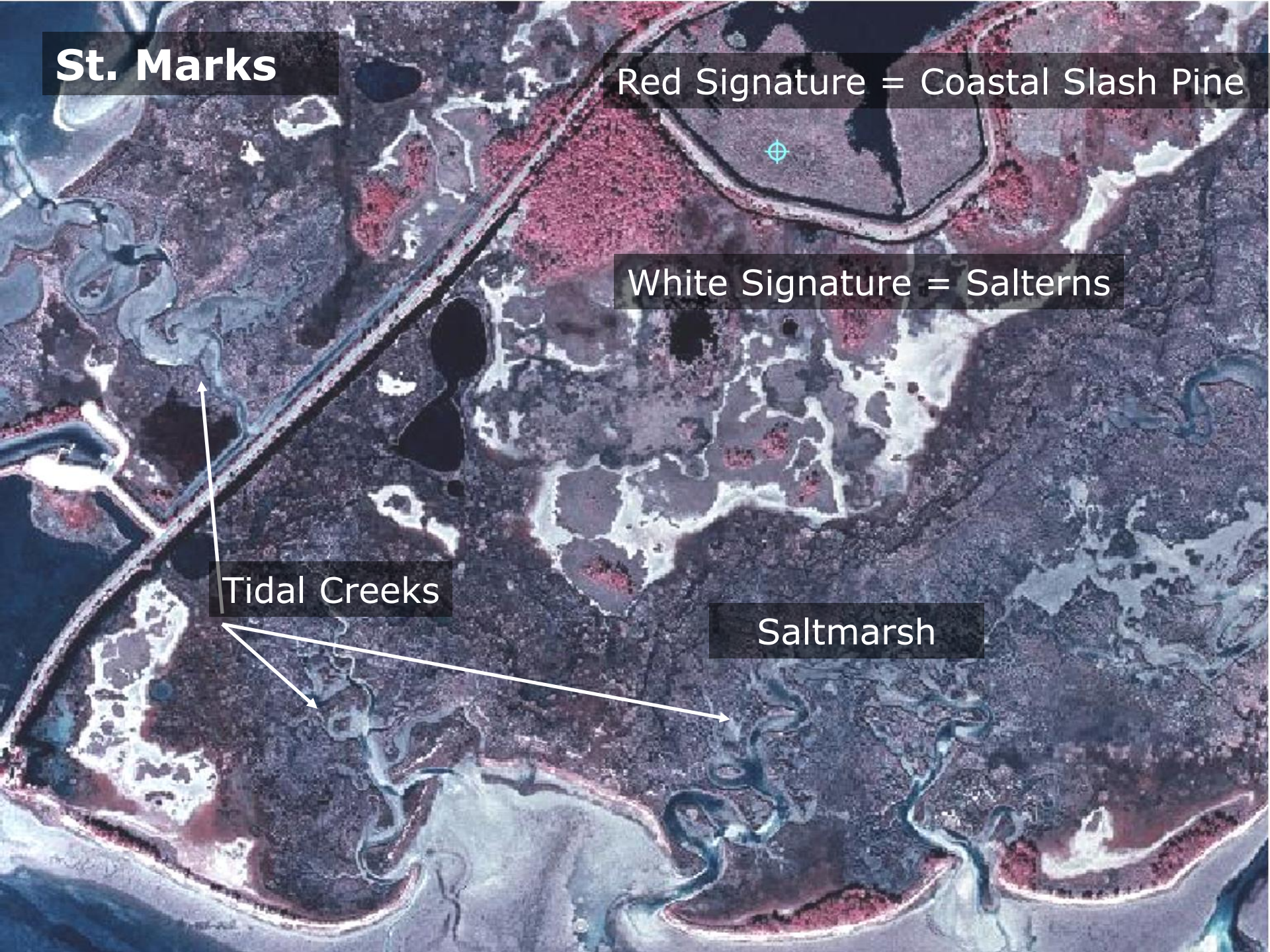
St. Marks

Red Signature = Coastal Slash Pine

White Signature = Salterns

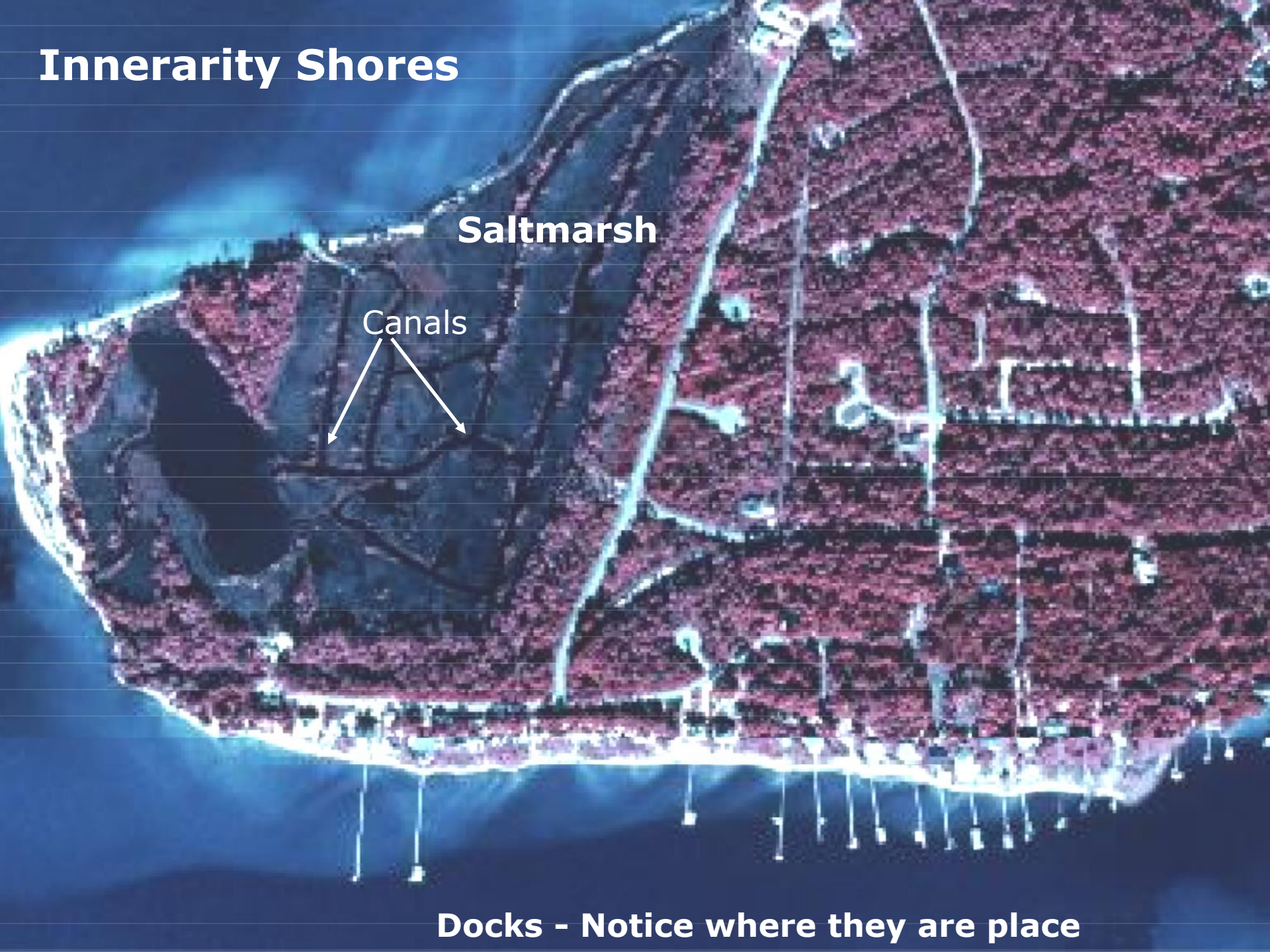
Tidal Creeks

Saltmarsh





Innerarity Shores

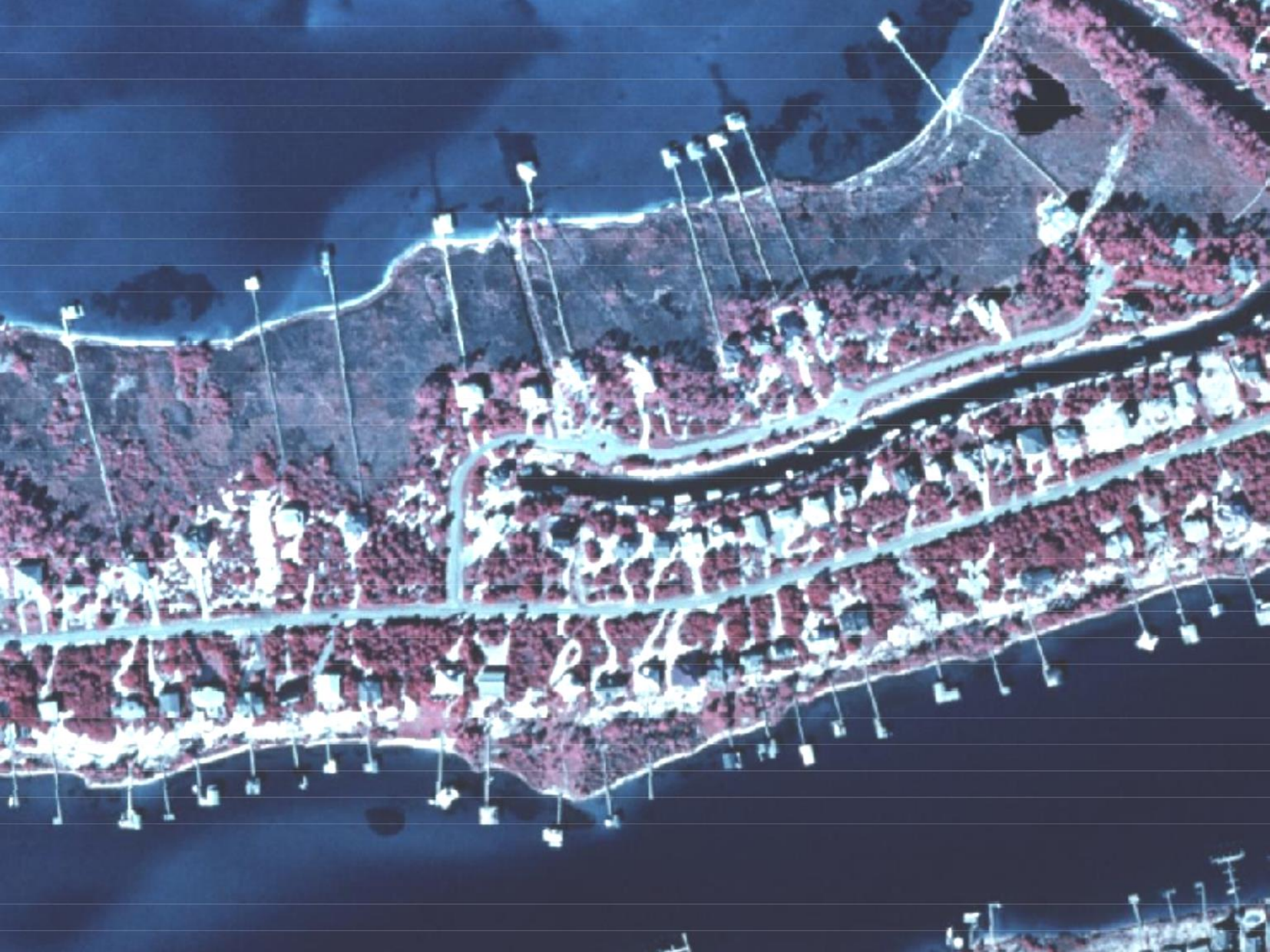


Saltmarsh

Canals

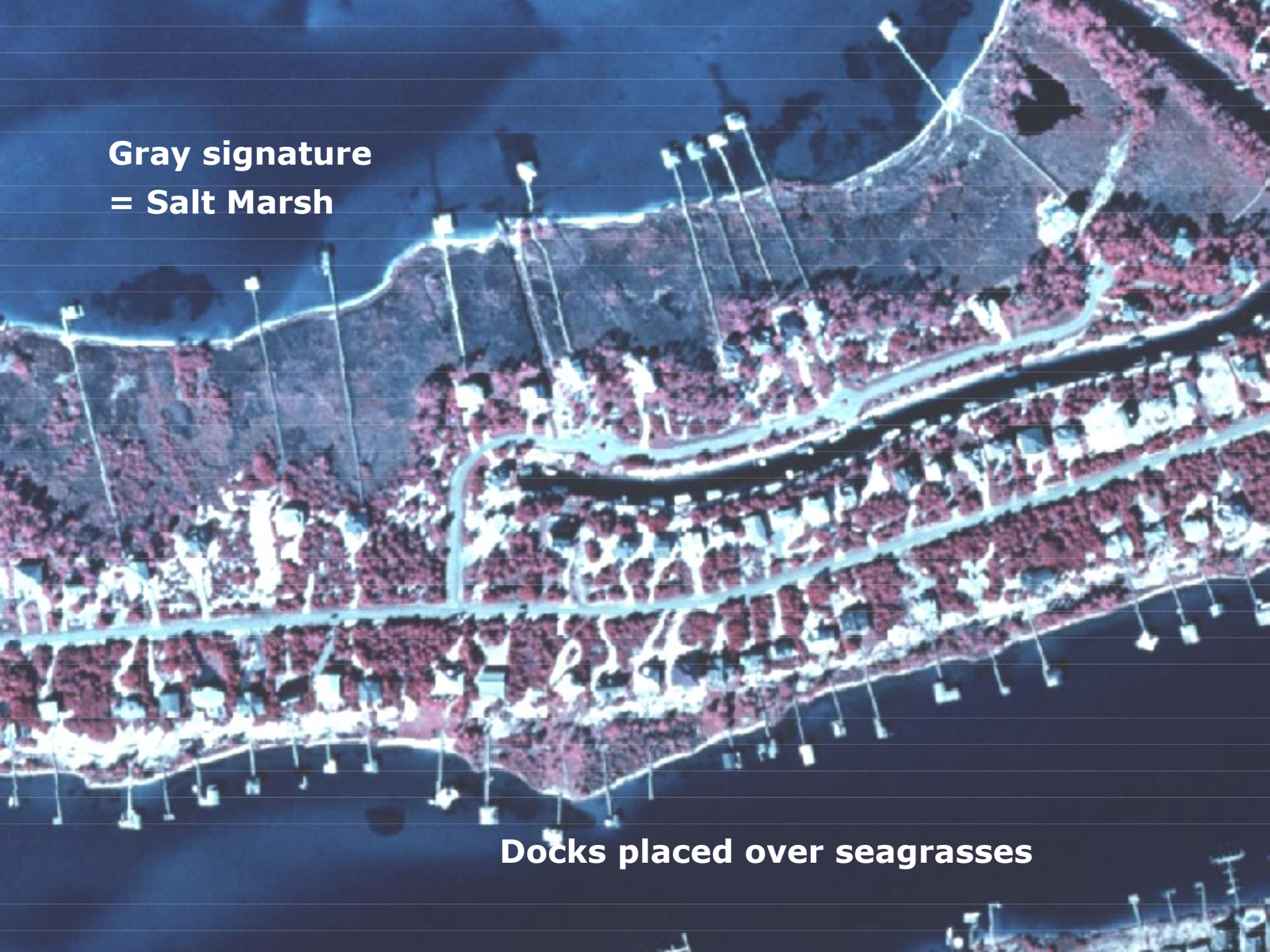


Docks - Notice where they are place



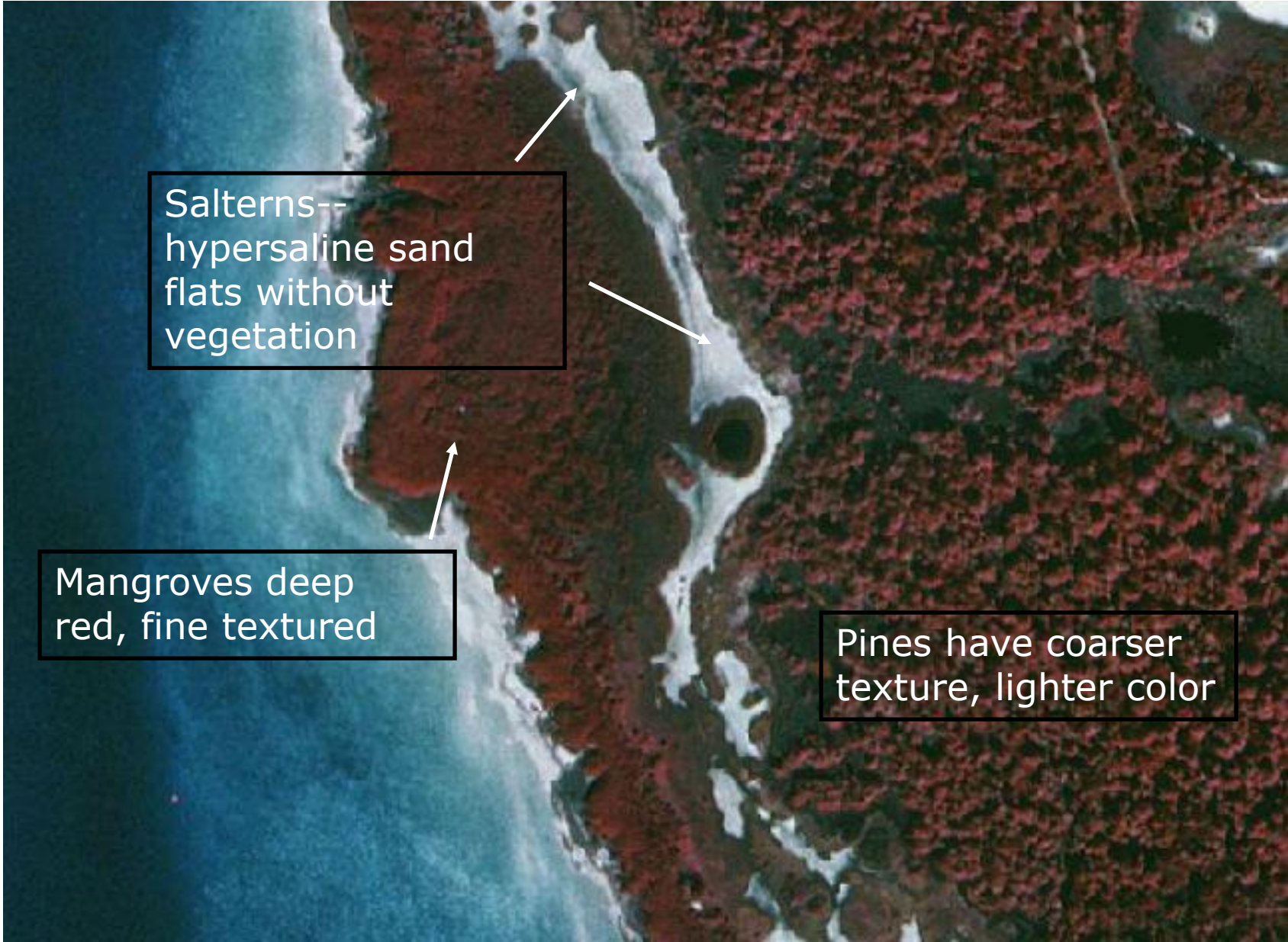
**Gray signature
= Salt Marsh**

Docks placed over seagrasses







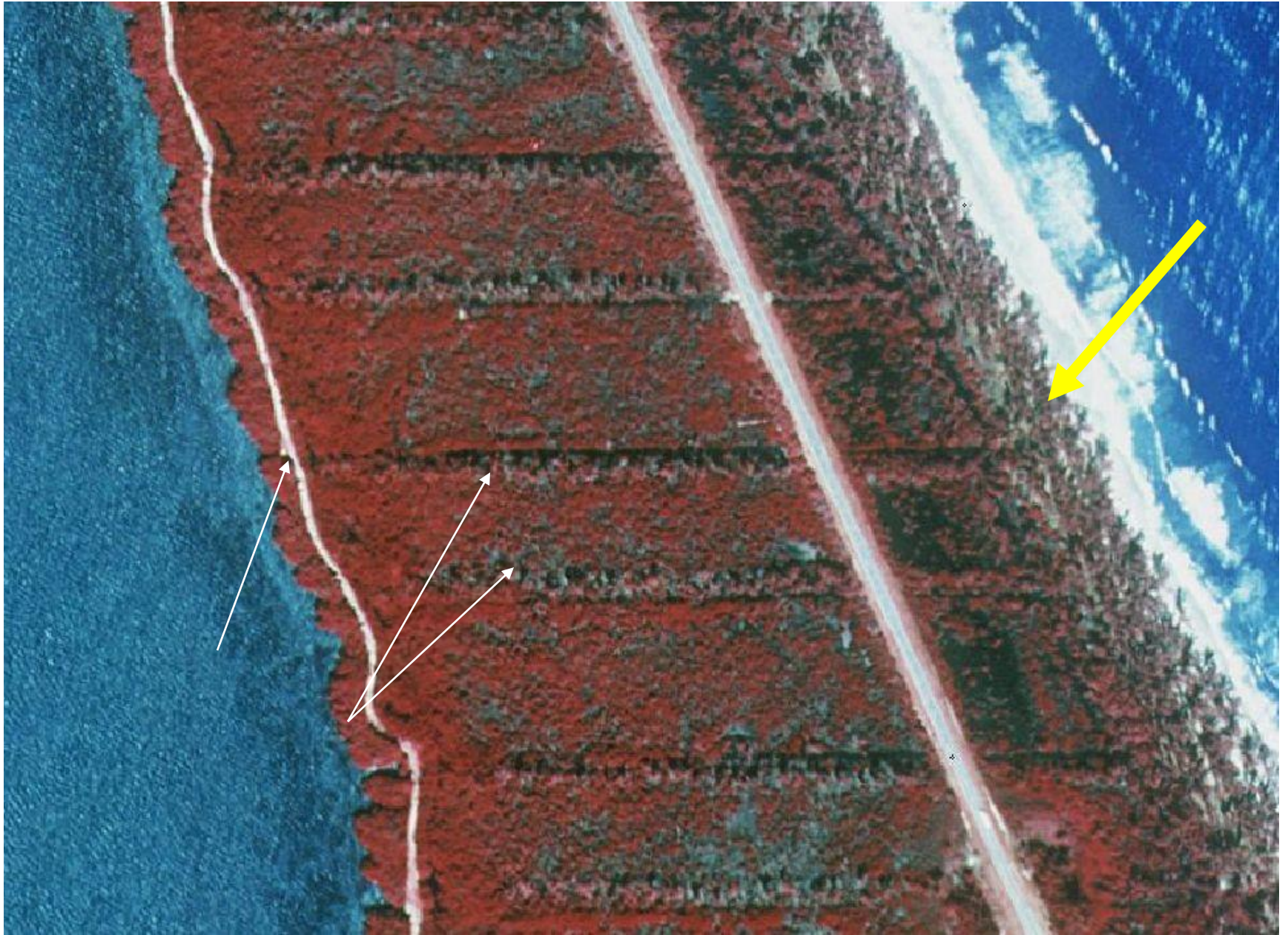


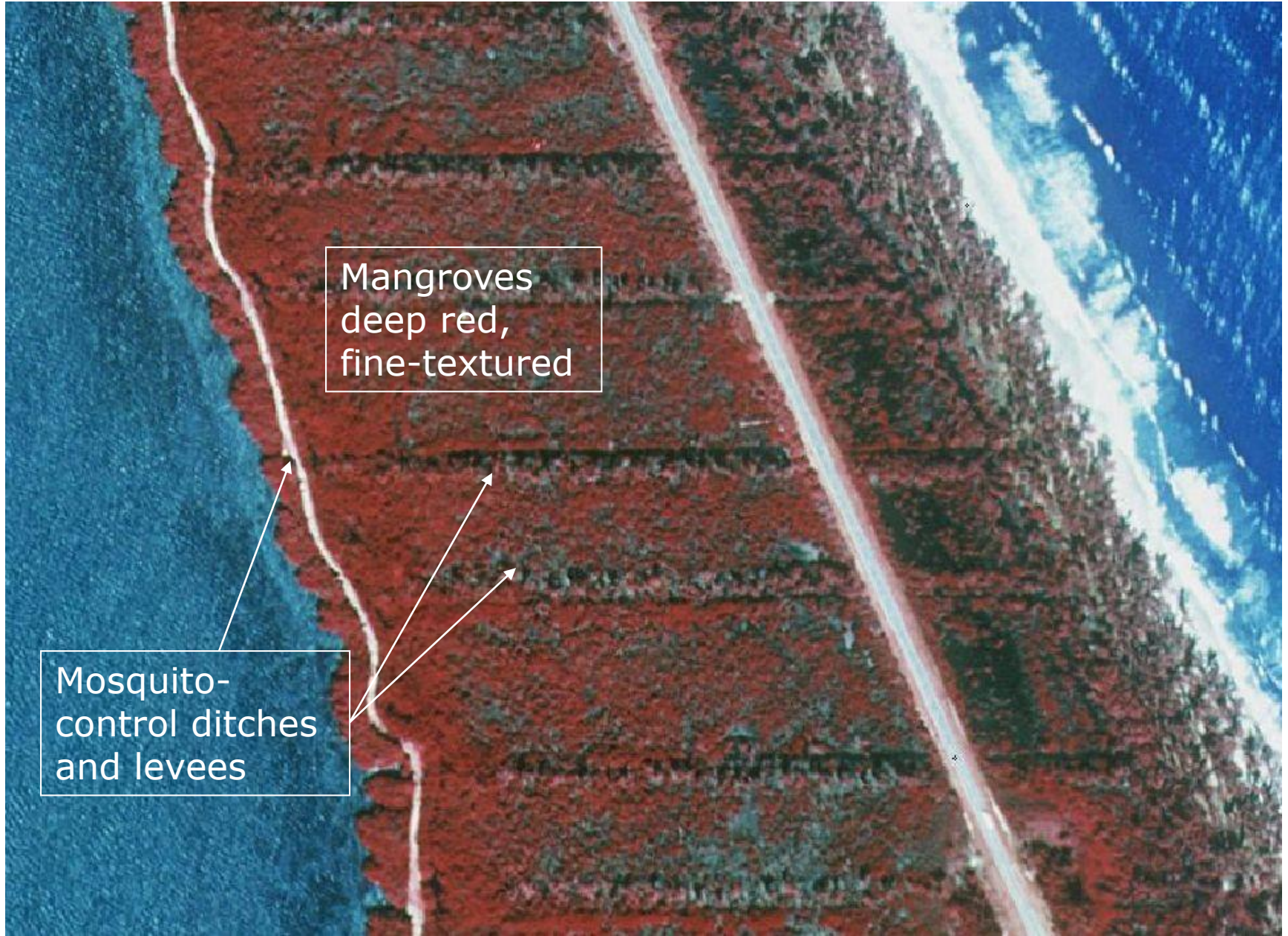
Salterns--
hypersaline sand
flats without
vegetation

This aerial photograph shows a coastal wetland landscape. On the left is a body of water. To its right is a strip of land with three distinct vegetation types. The top part of this strip is a light-colored, irregularly shaped area labeled 'Salterns'. Below this is a dark red, fine-textured area labeled 'Mangroves'. To the right of the mangroves is a large, dark green area with a coarse texture labeled 'Pines'. A narrow, light-colored path or canal runs between the mangroves and the pines. Three white arrows point from the text labels to their respective areas in the image.

Mangroves deep
red, fine textured

Pines have coarser
texture, lighter color

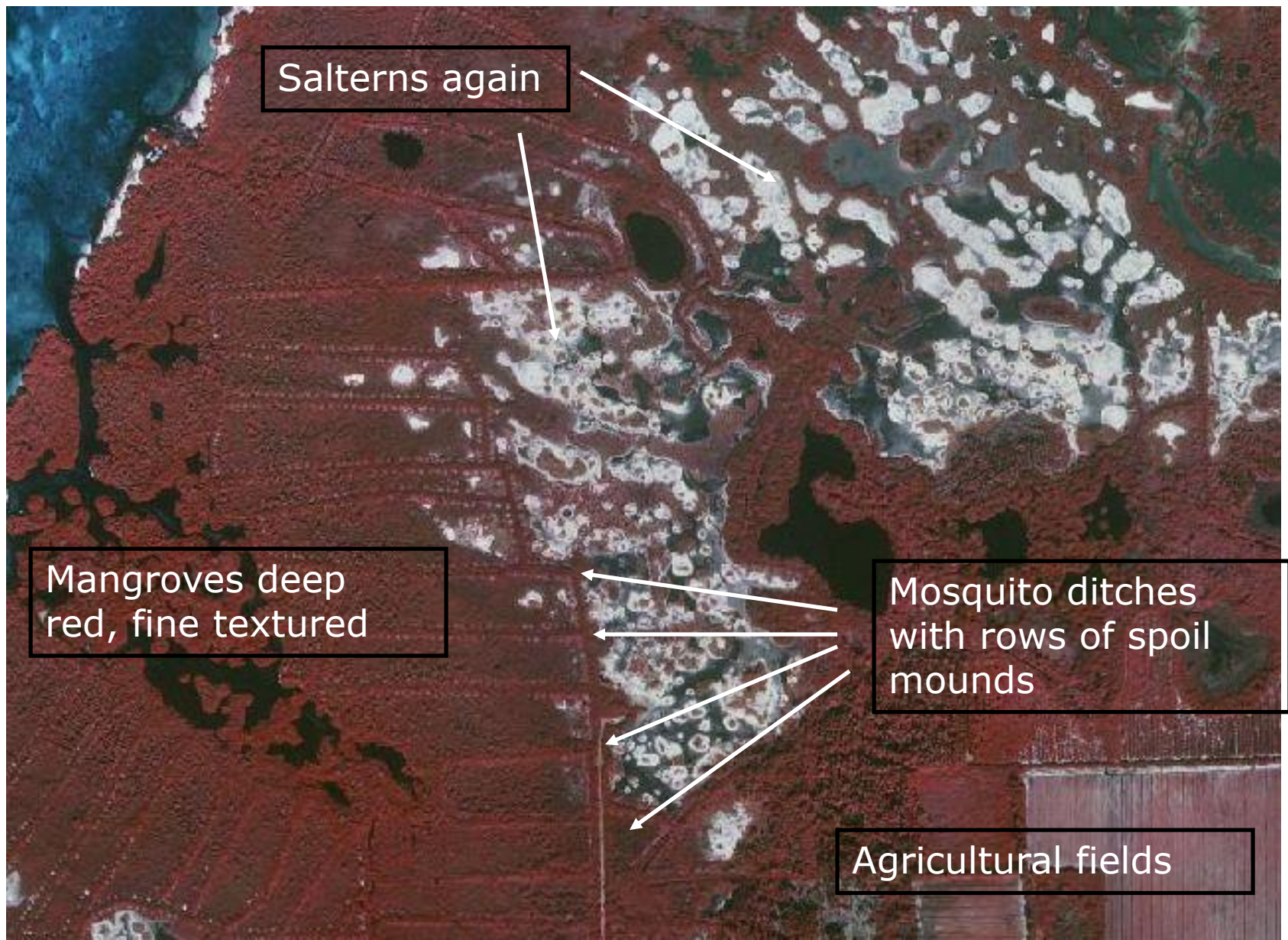




Mangroves
deep red,
fine-textured

Mosquito-
control ditches
and levees





Salterns again

Mangroves deep
red, fine textured

Mosquito ditches
with rows of spoil
mounds

Agricultural fields





Salterns

Old agricultural fields

Mangroves deep
red, fine textured





Planted Pine Plantation

Clear cut
Area - Dark
suggest
wet

Remaining
Cypress Domes



Is this a wetland?



1994 DOQQ

Is this a wetland?



1999 DOQQ

Is this a wetland? Yes!



1999 DOQQ
with DEP wetland line



N

Bald Point, Franklin County, Florida



N Enlargement of Bald Point, Franklin County, Florida



N Just west of Bald Point, Franklin County, Florida



Lake Edge, Tallahassee, Florida

Drying lake edge, note tree line. Although this area may look like a dry, sandy landscape it is actually within our surface water boundary.





Lake Jackson, Tallahassee, Florida



Floodplain Apalachicola River

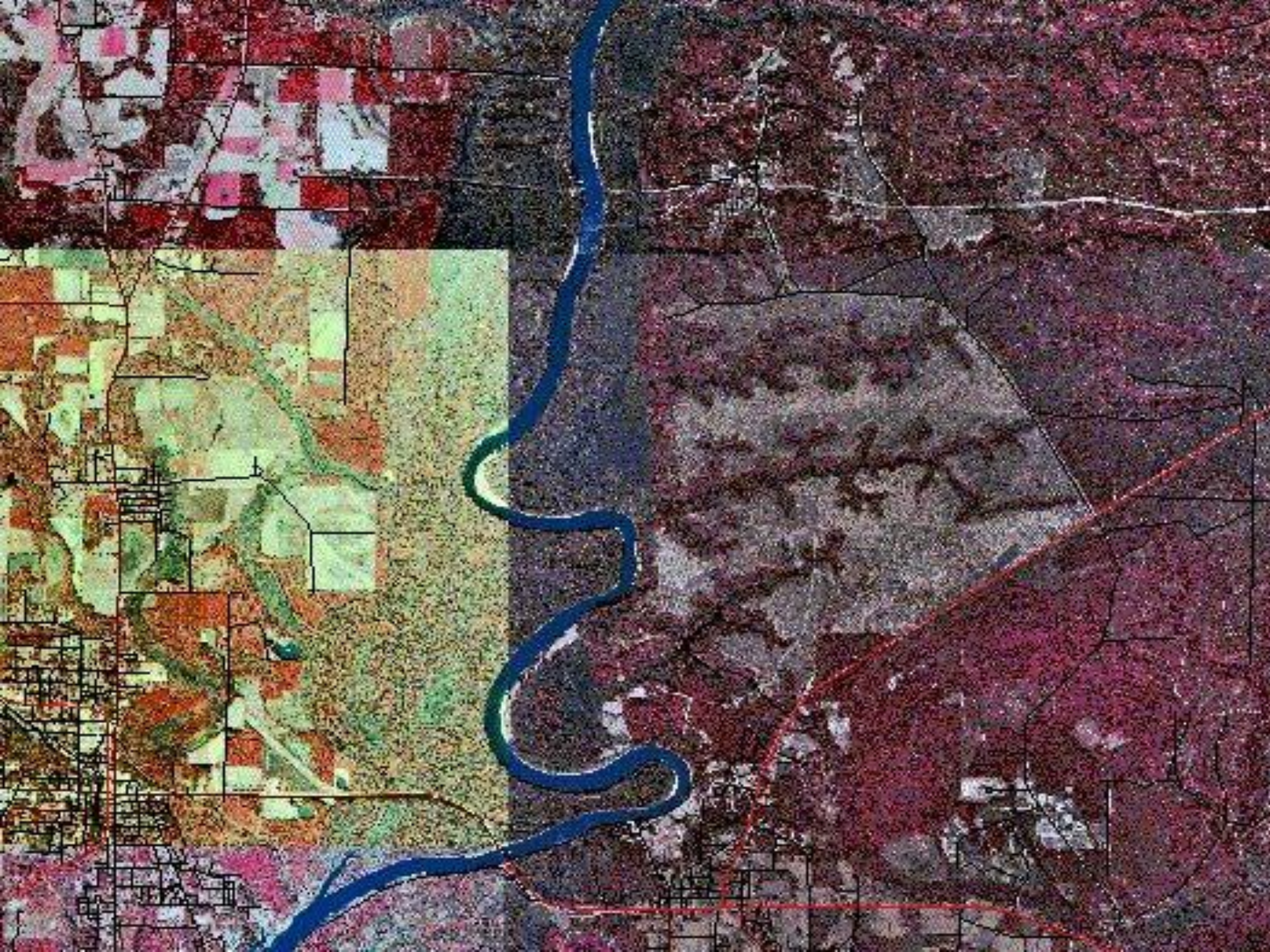
Floodplains swamp





Sandhill









River floodplain, ravines, steepheads and agricultural lands



**River
floodplain**

steephead

Ravine forests

River floodplain, ravines, steepheads and agricultural lands

Pine rockland





Pine rockland with *Thrinax morrisii* -thatch palms and Trailing Eugenia or Long stalked stopper.





N

Key Deer Blvd



Key Deer Blvd

Keyvaca very
gravelly loam,
extremely stony

Rock outcrop-cudjoe
complex, frequently flooded

Rock outcrop-cudjoe
complex, tidal



Tropical Hammocks are found on the limestone outcrops and the elevated, coastal sands of the Florida Keys and south Florida. These hardwood dominated forests can develop anywhere in Florida where the soils are elevated and generally non-hydric, and cold temperatures of winter do not limit the growth of subtropical tree species. Typical plant species are related to those found in the West Indian flora. Tropical hammocks in Florida are generally not wetlands *, however some “hammocks” of the Everglades could be considered wetlands and the species composition is not the same as what we will consider tropical hammocks of the rocklands and the Florida Keys.





Tropical hammocks

are most developed on the upper keys. Here they grow in thin folist soils on limestone. Key Largo is one of the best places to see tropical hammocks. These forests share species in common with tropical hardwood forests of the West Indies. Most of these plants arrived in south Florida relatively recently, ca. 10,000 y.a. Several rare and endemic species such as snails, butterflies and plants are found nowhere else



Coastal hammocks are often found just behind the coastal dune or in this case, the beach on the south side of Big Pine Key. Here the hammock is growing on deep sands and the plants are those adapted for salt tolerance and wind shearing.

hammock

dune vegetation



Coastal Dunes

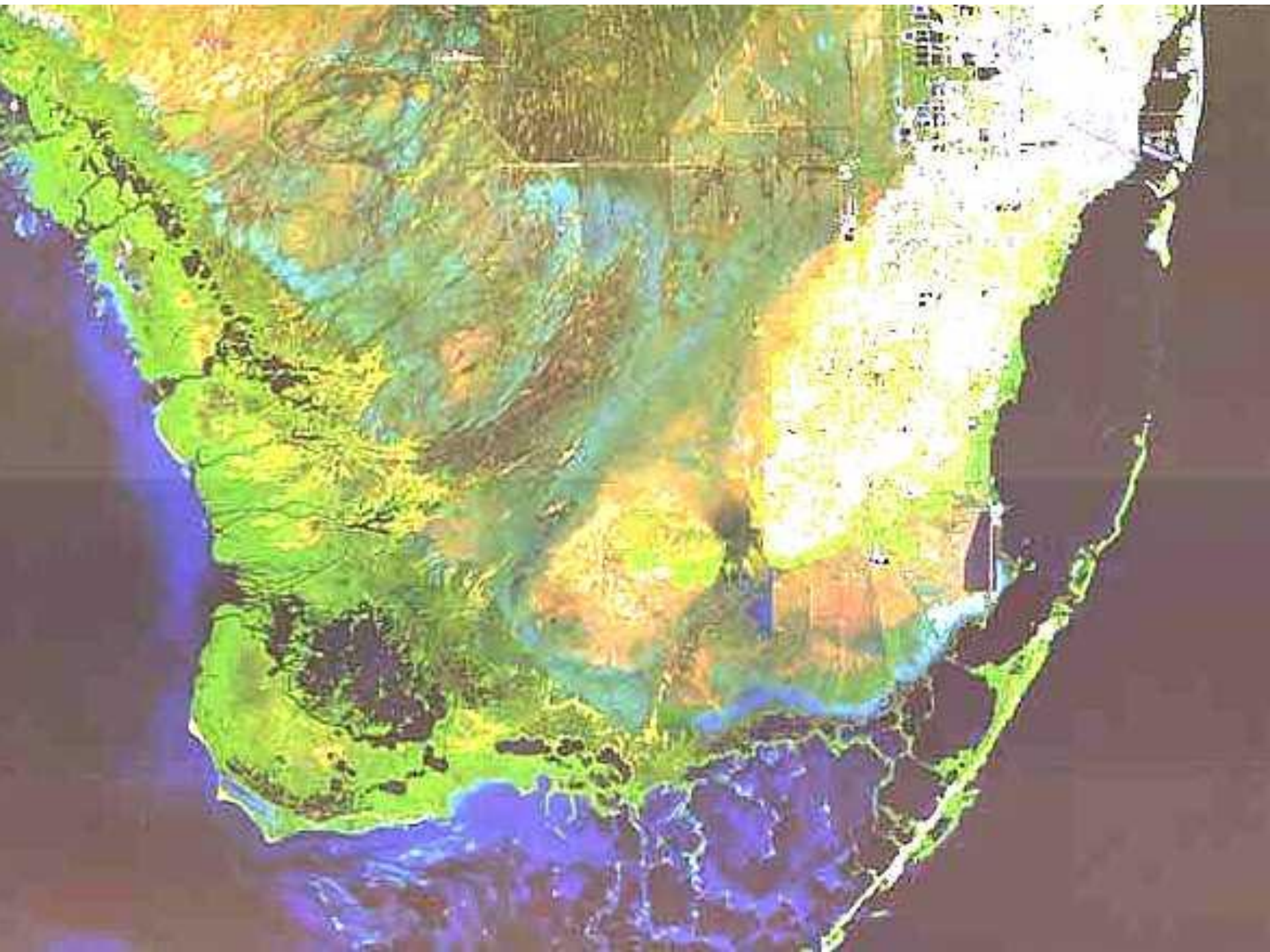
Beach Dune - found on very dry, well drained soils associated with shorelines/beaches. Floristically related to scrub and xeric hammocks. Beach dunes in south Florida may contain plants of tropical origin, particularly plants of the West Indies. Sadly, most beach dunes have been destroyed in south Florida. Look for good examples on state lands.





Changes in plant communities can result from catastrophic natural phenomenon, such as hurricanes.

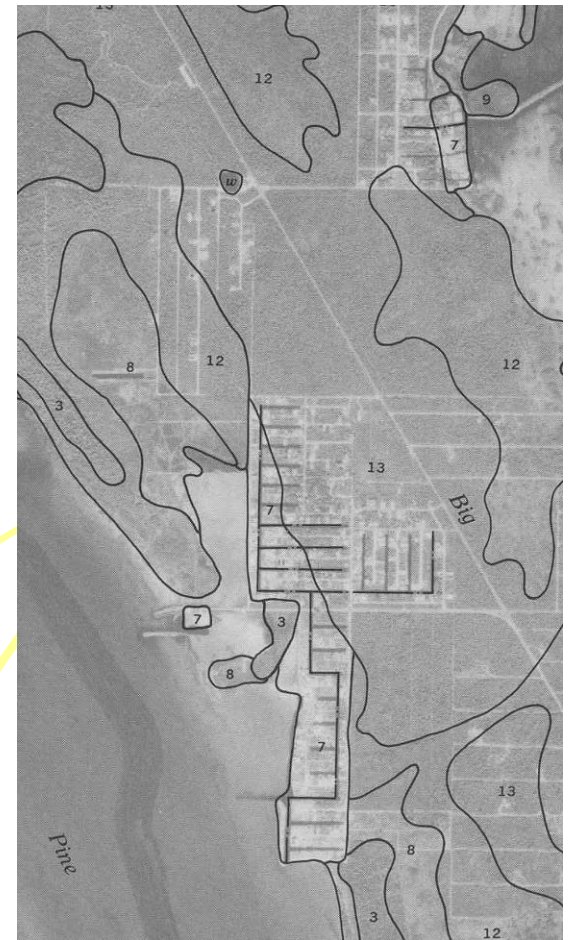
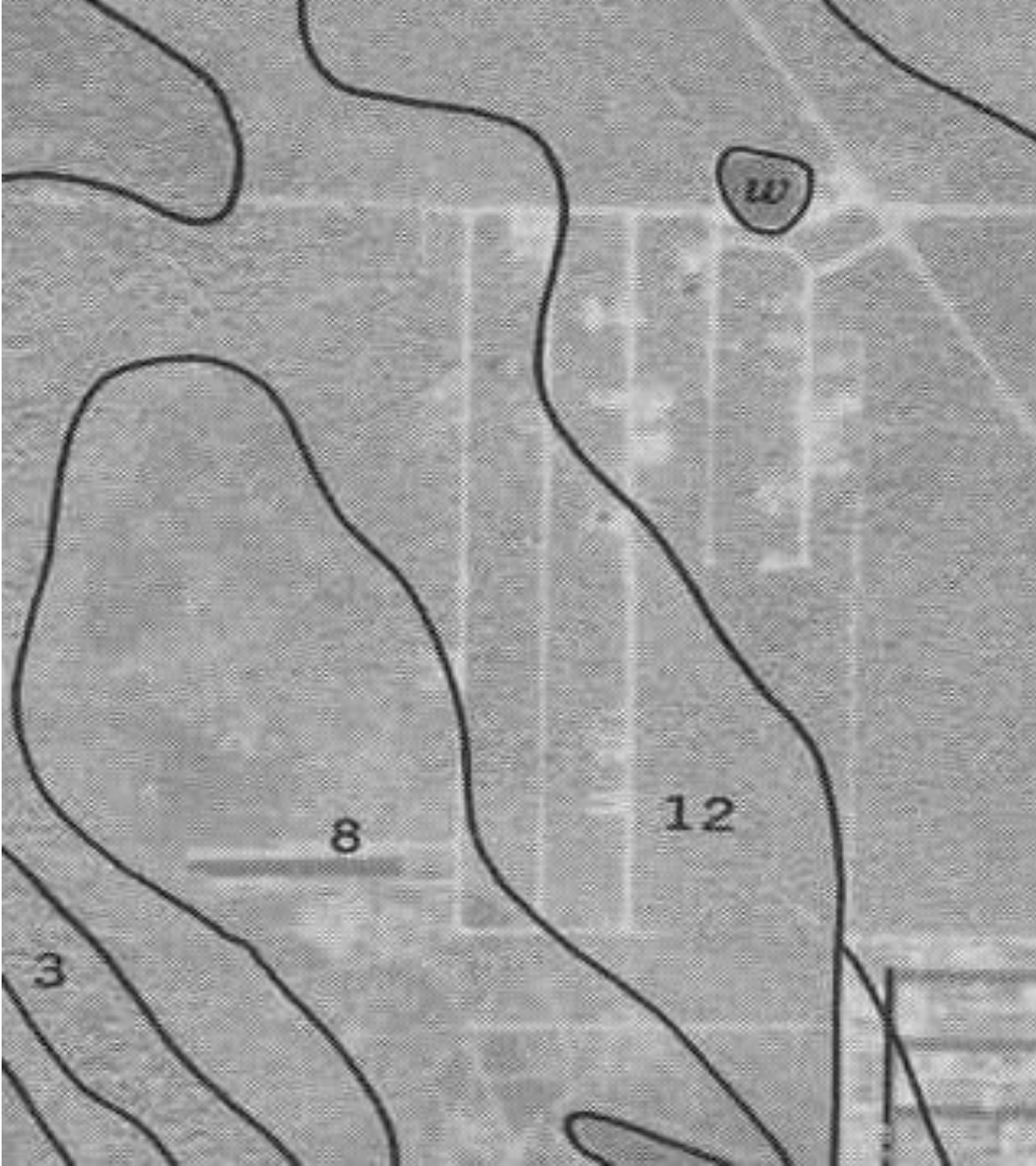




Strumpfia flats with pine rocklands, dry season.







**Strumpfia site
location on
Big Pine Key**



Key Deer Blvd

upland

wetland



Buttonwood flats

Look for buttonwood, keysgrass, cordgrass, seashore dropseed grass, and black mangrove. These seemingly barren landscapes are often strewn with fragments of limestone. The soils are hypersaline and plant diversity is low. However rare bromeliads live in the branches and these areas serve as water storage during storms.

Buttonwood flats

During the wet season these wetlands support algal growth and a variety of invertebrates and aquatic insects. These in turn provide valuable food reserves for wading birds and other animals.





**Wetlands in the keys
may be difficult to
identify depending
on the time of year
and local rainfall
patterns.**

**This is a hypersaline
flat that is periodically
disturbed. Use the
altered sites test.
What would the site
look like were it not
for the disturbance.**



Dwarf black mangrove forest on Big Pine Key brackish or hypersaline?



Black mangrove forest growing in hypersaline overwash area of Big Pine Key near Longbeach Road.



Hypersaline flats are created from tidal overwash that has evaporated leaving the soil saturated with brine. Very few plants can survive in these soils. In this view, saltwort and keysgrass are in the groundcover.

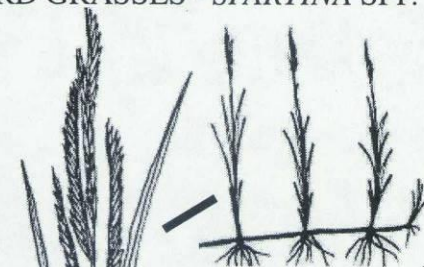


**Hypersaline flat dominated by keysgrass,
salicornia, a few black mangroves and
buttonbush**









S. bakeri
SAND CORDGRASS
FACW

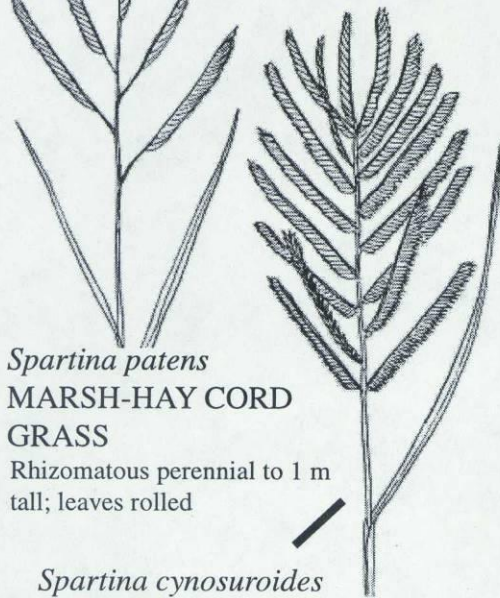
spikelets scabrous
6-10 mm long
tufted perennial
to 2 m; leaves
rolled

rhizomatous perennial;
plants to 2 meters tall

Spartina alterniflora
SMOOTH CORD
GRASS

Spartina spartinae
GULF CORD GRASS

tufted perennial;
1 meter tall



Spartina patens
MARSH-HAY CORD
GRASS

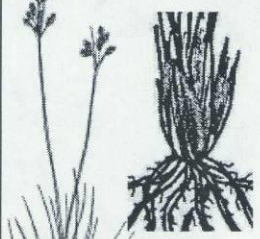
Rhizomatous perennial to 1 m
tall; leaves rolled

Spartina cynosuroides
BIG CORD GRASS

...ida's largest cord grass, rhizomatous perennial to 2

© JOHN DAVID TOBE 2000

Sporobolus virginicus
SEASHORE DROPSEED
GRASS



Tufted perennial to 80
cm tall; leaves rolled;
leaf base dark brown

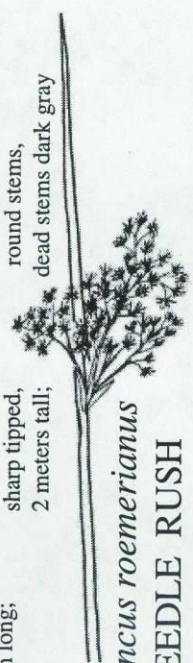
Fimbristylis castanea
SALTMARSH

sharp tipped,
2 meters tall;

panicles narrow, 3-11 cm long;
plants to 30 cm tall

round stems,
dead stems dark gray

Juncus roemerianus
NEEDLE RUSH

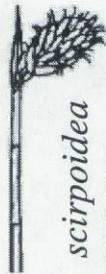


Scirpus americanus
THREE SQUARE



triangular stems to 1.5 meters tall

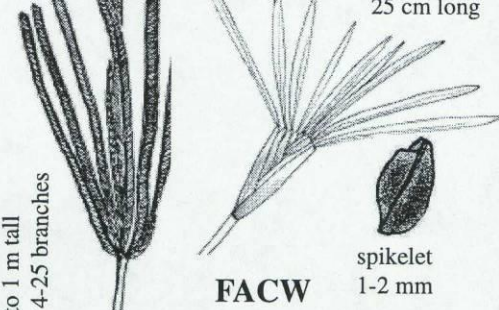
Fuirena scirpoidea
RUSH FUIRENA



segmented round stems, to 60 cm tall;
spikelets solitary or 2-3

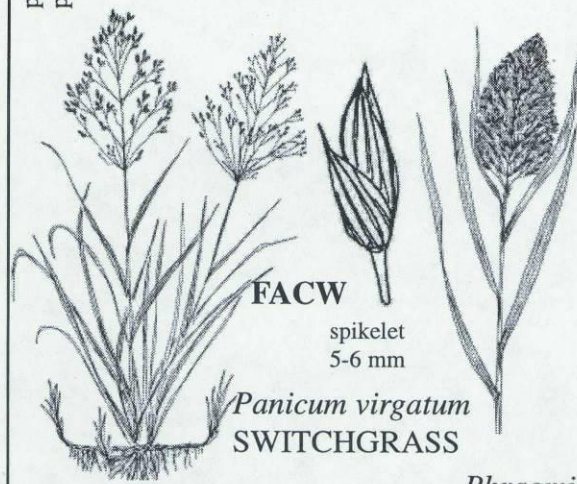
dense full panicles, 3-8 cm long,
spikelets flattened. 6-15 mm long

Distichlis spicata



Eustachys glauca
FINGER GRASS

spikelet
1-2 mm

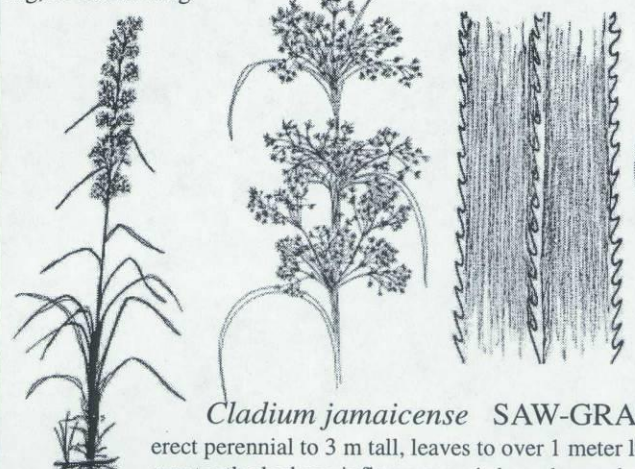


Panicum virgatum
SWITCHGRASS

spikelet
5-6 mm

erect perennial to 2 m tall, leaves to 60 cm
long, 5-15 mm wide; panicle large, spread-
ing, 15-50 cm long

Phragmites australis
GIANT REED



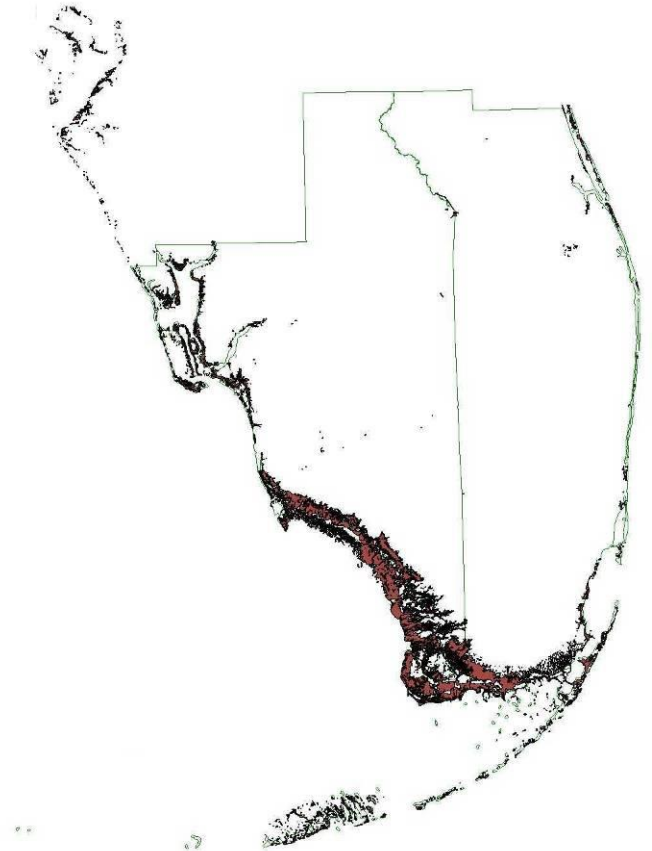
Cladium jamaicense SAW-GRASS

erect perennial to 3 m tall, leaves to over 1 meter long

Mangrove swamps - are dominated by woody, tropical mangrove species. Red, white and black are typical. A very important type of wetland. Healthy mangroves = healthy fisheries. Coastal development has wiped out much of this type of wetland. The largest contiguous expanse of mangroves in Florida is found in the Everglades National Park, Ten Thousand Islands area, Florida Bay.



Red Mangrove



Mangroves and oyster bar. Mangroves are contributing to the food web by dropping leaves which are converted into food for the base of the estuarine food web. Oysters are filtering material that is flushed in and out of the mangrove swamp.





Dwarf red mangrove on fill



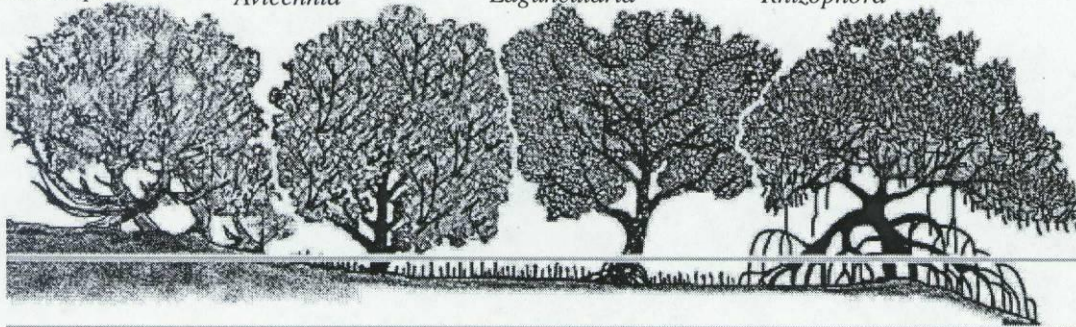


Buttonwood
Conocarpus

Black Mangrove
Avicennia

White Mangrove
Laguncularia

Red Mangrove
Rhizophora



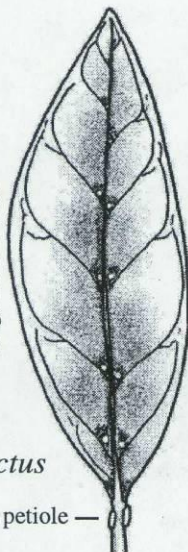
Mean High Water

Mean Low Water

cluster of scalelike
winged fruits

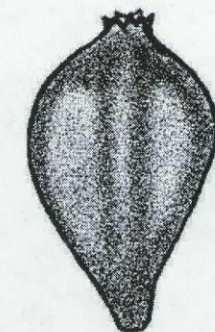


leaves alternate, 2-10 cm
long, 2-3 cm wide



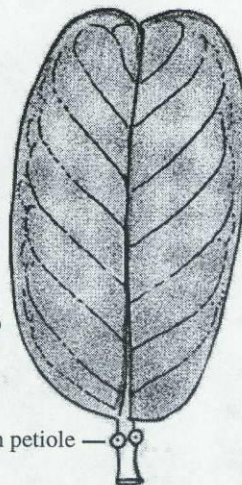
Buttonwood
Conocarpus erectus

glands on petiole —



fruit a ribbed, dark
brown, leathery drupe

leaves opposite, 2-7 cm
long, to 5 cm wide



glands on petiole —

White Mangrove
Laguncularia racemosa

leaves opposite, 5-8 cm long, 2-5 cm
wide; upper surface often with salt grains,
lower surface pale gray

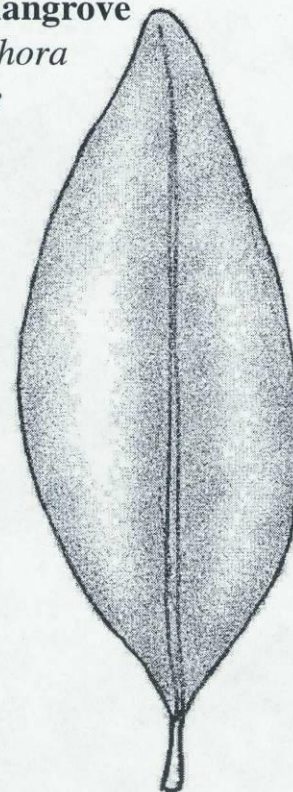


Black Mangrove
Avicennia germinans



opposite leaves, dark green above,
silvery gray below; bark dark
grayish-brown to blackish; upright
roots produced called pneumato-

Red Mangrove
Rhizophora
mangle



opposite leaves, glossy above
green below, often with black
spots; seedlings germinate on
tree-an elongate propagule; la-
trees to 50 ft, extensive prop-

le-like"
lifesize

alternate leaves, angled stem, leaves green
and smooth or hairy - var. sericea; fruit a