MAY 21 1993

INTERIM REFORESTATION PLAN

FOR

ST. CATHERINE CREEK NATIONAL WILDLIFE REFUGE

NATCHEZ, MISSISSIPPI

1993-1997

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Date

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Interim Reforestation Plan 1993-97
St. Catherine Creek National Wildlife Refuge

I. INTRODUCTION

St. Catherine Creek NWR presently consists of 13,478 acres of fee title land in Adams County, Mississippi. A projected acquisition boundary contains approximately 34,000 acres. The project area lies immediately south of Natchez, Mississippi, along the Mississippi River to its junction with the Homochitto River. The loess bluffs form the eastern boundary.

This refuge was first established under the North American Waterfowl Management Plans's Lower Mississippi River Joint Venture. Fee title purchases were primarily comprised of two major tracts of over 6,000 acres each. One smaller tract was also purchased in 1991. A large unit, Sibley Farms, consisting of 10,000 acres, is currently being appraised for purchase pending the availability of funds. The Sibley Farms unit is not included in this initial plan, although it too will require some limited reforestation.

One of the primary goals of the refuge is to restore bottomland hardwoods to those areas of the refuge not needed for other management purposes. In the case of this refuge, this acreage is significant since most of the land was converted to farmland in the 1970's prior to Service ownership. A large amount of acreage is available initially for reforestation.

This reforestation plan will serve as an interim guide until acquisition is essentially complete and will be flexible enough to accommodate needed changes brought about by additional acquisition. This plan will include reforestation on 2,044 acres. Basically, this document will serve as a reforestation guide since no other timber management is anticipated in the near future.

A forest management plan will be developed after acquisition of the refuge is complete. It will address timber management in more complete detail.

II. EXISTING HABITAT

The two major ownerships purchased by the refuge are the Armstrong tract and the Anderson tract. The other tract consisting of 219 acres is essentially forested. Both of the larger tracts are over 6,000 acres in size.

The Anderson tract is almost exclusively agricultural land and is the most northern part of the refuge. At present, this

unit represents the major waterfowl management area of the refuge and contains an excess of 20 water control structures with more planned. This unit also contains all of the refuge cooperative farming program. The largest single block of woods on the refuge is found along the Mississippi River in this unit. Many of the fields in this area are marginal with regards to keeping them in the farm program. Some of these fields will be considered for reforestation under this plan.

The Armstrong tract was largely cleared for agriculture with the exception of lakes, streams, and a few areas too wet to farm. Prior to Service ownership, the previous owner put 2,600 acres in the Conservation Reserve Program (CRP) and planted the area to acorns. Prolonged high Mississippi River water apparently caused the acorns to rot. This first attempt to reforest this area was a failure, and as part of our purchase the Service agreed not to farm these fields. Mr. Armstrong did not have to proceed with replanting these field, received no further payment from the ASCS, and did not have to return payments he received for his 2 years in the CRP program. The Fish and Wildlife Service agreed to maintain the CRP planted fields as they were intended. Therefore, these acreages will need to be replanted in the future. The reforestation efforts in this tract will be along the Old St. Catherine Creek and the ground along the bluffs. Replanting of the CRP areas will be considered at a later time.

Much of the Armstrong tract will reforest in time, but the vegetation colonizing this area will be less desirable light seeded species such as willow, box elder, green ash, hackberry, sycamore, cottonwood, and sweetgum on the higher sites. Fields are now head high in most areas with herbaceous vegetation such as Johnson grass, balloon vine, trumpet creeper, pepper vine, dew berry, sesbania, smartweed, cocklebur, vervain, and some woody growth such as willow, sycamore, button bush, and cottonwood.

Due to the unpredictable nature of the Mississippi River and its associated flooding, there is often a short window for reforestation. In addition, flooding may be of significant duration especially during the spring and often even into early summer. With these conditions in mind, a team consisting of Associate Manager Travis McDaniel, Refuge Manager Tom Prusa, District Forester Clyde Stewart, and District Wildlife Management Biologist Ray Aycock have recommended that the highest sites on this tract be reforested first with oak seedlings. Heavy emphasis will be placed on Nuttall Oak which is more wet-site tolerant and is the best acorn to plant when direct seeding is used. Cypress seedlings will be planted on the wetter sites and sweet pecan on the creek banks or higher ridges.

Small fields particularly on the upper sites next to the bluffs will be allowed to regenerate naturally from adjacent stands of water and willow oak. Undoubtedly, these fields will wind up with a wide variety of light seeded species as well as oaks.

III. REFORESTATION ACCOMPLISHMENTS

In 1992, a token effort was made by the refuge staff and volunteers to get a start on the reforestation of the refuge. Several areas were planted along the Old St. Catherine Creek filling in several of the oxbow areas. Over 4,000 Nuttall Oak seedlings were planted by hand in 4 different locations covering about 13 acres.

In 1993, 26 acres were planted to Nuttall Oak and Cherrybark Oak because of mitigation requirements from the Corps of Engineers and the Mississippi Department of Environmental Quality (MDEQ). Three private companies were required to plant 20 acres, 5 acres, and 1 acre respectively. These plantings were performed in order to meet the permit requirements caused by the destruction of bottomland hardwood occurring during either construction or oil/gas exploration. This is a great program for the refuge because all the refuge does is provide the site to plant trees. The private company is required to plant 300 hardwoods per acre of a species that is recommended by the refuge, and the planting is under the direction of a professional forester. The Corps or the MDEQ determines the number of acres to be planted and the refuge simply provides the site.

The major thrust in the reforestation effort began with the use of a hardwood tree planter loaned from the Mississippi Wetland District. Over 30,000 seedlings including Nuttall Oak, Willow Oak, Water Oak, Green Ash, and Bald Cypress were planted during the last week of March and the first full week of April, 1993. Because of the backwater flooding, and a shortage of available sites, it was necessary to plant two areas that were scheduled to be in the cropland program. This may also occur in subsequent planting seasons. Approximately 100 acres of trees were planted. There are approximately 10,000 more cypress seedlings to be planted when the water finally drops out in 1993. These seedlings will be planted in the wetter areas if they are still useable after such an extended storage period.

IV. REFORESTATION SCHEDULE

An aggressive reforestation schedule needs to be proposed. The schedule must be very flexible due to lack of funds, lack of manpower and equipment, and the unpredictability of the Mississippi River.

A hardwood tree planter has been acquired by the Mississippi Wetland District and is available to be used at St. Catherine Creek Refuge. Also, a John Deere 4760 tractor is a newly purchased piece of equipment which can handle any planter available. Planting of seedlings should begin as early in the fall as possible to avoid any rise in the Mississippi River. Any direct seeding should be done as soon as the cooperator's crops are harvested or as soon as the unfarmed areas can be disced. This will necessitate the purchase and storage of acorns for up to a year in advance.

The following schedule will consist of both direct seeding and seedling planting.

1993/1994 - 500 Acres
1994/1995 - 500 Acres
1995/1996 - 500 Acres
1996/1997 - 544 Acres

These figures are strictly target figures due to the uncertainty of funds and the possibility of having to plant over if the Mississippi River or other environmental factors cause unusually high mortality.

V. REFORESTATION SITES

Most of the 13,478 acres of the refuge will be divided into 5 plantations with the exception of the areas that are forested. The plantation maps are divided into 19 planting sites where reforestation efforts will take place.

Designating too specific of a site location is extremely impractical on this refuge because of the many variables that will effect where and when plantings can be done. Extreme flexibility must be exercised to accomplish this reforestation effort. As an example, in 1993 over half of the acreage that was planted to seedlings was planted in 2 areas that were to be in the cropland program. Because of the backwater flooding these 2 areas needed to be utilized to plant the seedlings that were purchased. Due to the topography of this country, many areas within the cooperative farming program may be prime candidates for tree planting. However, much care and planning is needed before utilizing cropland for tree planting. Once planted, a forested site is essentially being dedicated to centuries of that habitat type. Because waterfowl is our primary objective there needs to be a mix of forested and farmed/moist soil sites. Sufficient cropland and moist soil areas will continue to exist on the refuge to support a variety of migrant wildfowl. This is especially true for cypress planting around the waterfowl impoundments. These sites may only be 1-2 acres in size and would be scattered throughout the cropland areas. Other sites could be 10-100

acres in size reducing the amount of acreage in the cropland program. Eventually, the cooperative farming program may be limited to about 1,000 acres or less. For this reason, the record keeping of areas planted will be very important and will be discussed in section IX. of this plan.

VI. SPECIES TO BE PLANTED

The following tree species will be planted:

Nuttall Oak	(Quercus nuttallii)
Water Oak	(Quercus nigra)
Willow Oak	(Quercus phellos)
Cherrybark Oak	(Quercus falcata)
Sweet Pecan	(Carya illinoensis)
Green Ash	(Fraxinus pennsylvanica)
Bald Cypress	(Taxodium distichum)

The tree species proposed for planting were selected with regard to the soil types and the extreme water regimes that exist. Nuttall Oak and Bald Cypress will be the dominant tree species planted. Cherrybark Oak will be planted only on sites that will not go under water. Other species will be planted in various locations interspersed in the Nuttall Oak plantings. Again, because of the backwater flooding the majority of the planted species need to be as tolerant of prolonged flooding.

Species diversity will occur through the combination of planting the hard to establish species and the invasion of volunteer species that are native to the area. Seed sources for invader species are found near all plantations and are distributed by various methods. The planting of other tree species besides those listed is not being ruled out. This interim plan is by nature tentative because seedling/seed availability cannot be guaranteed. Other species suitable to site conditions will be considered to increase diversity. Achieving greater species diversity will depend upon being able to purchase other species of seeds or seedlings on the open market.

VII. SITE PREPARATION

Site preparation on areas to be planted to seedlings will be limited to mowing. Mowing will only be done if it is deemed absolutely necessary. Most of the time there will be no site preparation prior to planting seedlings. The vegetative cover is needed for the seedling planter to operate in wet conditions.

Direct seeding will be carried out only on areas that were cropped and harvested immediately preceding planting or on

areas that have been disced. Discing will increase the time the field can be planted and will reduce the initial weed competition.

VIII. PLANTING RATES AND SPACING

Seedlings

Seedlings will be planted at a rate of 300 per acre or a spacing of 12' X 12'. At this rate and spacing a 60% success rate will provide for 180 tree per acre. Hopefully, the success rate will be higher than 60%. The advantage to this spacing and planting rate will: 1) provide for an adequately stocked stand of trees per acre; 2) provide for an open canopy that will encourage larger crown development and earlier mast production; 3) provide for an open canopy that will allow a longer period for establishment of invading species and greater plantation diversity; and 4) provide for a spacing that will provide adequate timber harvest potential.

Direct Seeding

Assuming a 35% germination rate and a 50% survival, 900-1,200 acorns per acre would suffice to achieve a rate of 160-180 trees per acre. Spacing will generally be 12' X 3.5'. Other spacing yielding comparable rates will not be ruled out. Nuttall Oak will be the predominant species planted by seed because of its tolerance to extreme flooding. Planting should occur as soon as possible in the fall, either after a crop is harvested or a field is prepared by discing.

The refuge will have the capability of storing, on-site, a large number of seedlings and acorns in a refrigerated trailer. This unit should be available for use by the end of the summer of 1993.

IX. PLANTING DOCUMENTATION

Records of all plantings will be made in detail to include: species; spacing; condition of seedlings at planting; soil conditions; site preparation; weather conditions; dates of plantings; and a location map. Files will be updated with this information for all plantings. All records need to be as detailed as possible so that anyone knowledgeable about reforestation will be able to understand what was planted where and under what conditions. This will help in the evaluation of why some plantings were successful and others were not. Documentation, including maps with the plantings and treatments, will be maintained in the refuge's filing system under Habitat Management-Forest (file HM-3.9).

X. POST-PLANTING REQUIREMENTS

Evaluations

Survival checks will be conducted for the first time in the fall after the annual herbaceous vegetation begins the fall die-off. This is the best time to actually locate seedlings because of the tremendous growth of grasses and forbs during the summer.

In order to estimate the number of planted trees surviving per acre and the total number of trees per acre sample areas will be established. The sample areas will be plots 100' X 100'. This size plot will be randomly selected at a rate of 1 plot for every 5 acres planted. This may seem too large of a sample area, however, for the initial plantings it will be valuable to gather as much data as possible in a short time. Once the plantings become more routine, smaller and fewer sample plots will be adequate. The goal would be to have a stand planting with an average of 130-150 tree stems per acre, 40% of which would be species planted. This would be considered a fully stocked plantation after 2 growing seasons.

Fire Protection

Fire protection for the proposed hardwood plantations will be critical during their early development. Until some crown closure occurs, herbaceous vegetation in these plantations, when cured, could pose a significant fire hazard because no post planting maintenance is to be performed.

Firelanes will be maintained around all plantations to help alleviate the threat of fire. Because the incidence of fire is low in this area, most of the time firelanes can be maintained by mowing, which will keep vegetation in the firelane green. If this does not provide adequate protection, the firelanes will be disced. Eventually, firelane maintenance could become a major part of the reforestation effort covering many lineal miles. Firelane maps will be prepared as needed to document specific locations, treatment needed, and amount.

XI. COSTS

Because a good portion of the area comprising the refuge was logged and cleared, the major thrust for the near future must be the reforestation of many thousands of acres. The costs of this effort is going to be great, especially when seedlings are planted. The cost of planting an acre of tree seedlings

is many times the cost of planting acorns.

Equipment on hand or available includes a John Deere 4760 tractor, a hardwood tree planter on loan from the Mississippi Wetland District, and the availability of an acorn planter from Lake Ophelia Refuge. The refuge has also obtained a 40 foot insulated cooler that will be outfitted with an electric refrigeration unit and shelving to store seedlings and acorns.

Major costs will include the cost of seedlings/acorns, labor, fuel, maintenance, site preparation (when deemed necessary), and fire protection.

Much of the funding for this reforestation effort will need to be entered into the Refuge Master Project List. The following projects are already contained in the project listing. The projects are: 91024 Bottomland Hardwood Planting ($4,000) and 91017 Reforestation-Bottomland Hardwoods ($10,000). Other projects will be added at the next input period for the master project update.

Other sources of funds may come from the private sector. Interest from the Mississippi Wildlife Federation in conjunction with the newly established St. Catherine Creek Refuge Association may be a means in which funds could be solicited under a theme such as "Adopt An Acre". The amount of dollars raised by such a campaign with matching dollars through the Challenge Cost Share program could significantly help the effort.

XII. SPECIAL CONSIDERATIONS

Again, it can not be said too many times that the Mississippi River backflooding will dictate how, when, and where plantings will be accomplished on a year to year basis. Historically, over the past few years the following situations occurred:

1990 Backwater flooding occurred early in 1990 and remained until mid-June.

1991 Backwater flooding began the 3rd week of December 1990 and continued through 1991. The area was still under water in June when Assistant Manager Harold Morrow entered on duty.

1992 Backwater flooding occurred in January but receded quickly. The refuge basically remained flood-free the rest of the year except for a short period of rise in June.

1993 Backwater flooding occurred during the last week of

November 1992 and continued to inundate the refuge at the time of this writing. Predictions show that the flooding may be greater than in 1991.

Three out of the past four years the refuge has been underwater. The two cropland areas planted this year, the highest ground available, went totally under water 2 weeks after planting the seedlings. With this much flooding a good portion of the area can be used for moist soil management as long as some sort of reliable water control exist after June.

The main point here is that planting on this refuge, whether seedlings or acorns, is going to be difficult and tentative. It will be difficult to commit to the purchase of 150,000 seedlings to reforest 500 acres when, in reality, there may literally be no place to plant them. This is why it will be necessary to plant trees as early in December as possible to avoid the early rise in the river. Acorns can be planted in late October and November as soon as the crops are harvested.

Another special consideration occurs with the cooperative farming program. If too much of what is considered to be the best areas for crops is initially placed in the reforestation effort, there would be little incentive for a farmer to continue to plant crops on the refuge. Due to the lateness of planting crops most years, the farming is very tentative. Without the farming program, it would be impossible to keep natural plant succession in check and the area would revert to shrubs. This would be very costly to control once established.

XIII. PLANTATION MAPS

The plantation maps indicate present conditions including waterfowl impoundments, reforested areas, the Conservation Reserve Program planted areas, the areas to be reforested, and the areas that will remain in cropland in this initial interim reforestation plan. Within the areas to be reforested, it will be a judgement call as to what areas will be planted on a yearly basis.

PLANTATION SITE NUMBER	ACREAGE
1	30 Acres
2	32 Acres
3	160 Acres
4	205 Acres
5	113 Acres
6	50 Acres
7	182 Acres
8	70 Acres
9	65 Acres
10	98 Acres
11	220 Acres
12	60 Acres
13	44 Acres
14	70 Acres
15	65 Acres
16	205 Acres
17	125 Acres
18	160 Acres
19	90 Acres
TOTAL ACREAGE	**2,044 Acres**

PLANTATION MAP LEGEND

Plantation Sites

Reforested Areas (1992/1993)

Conservation Reserve Program

Waterfowl Impoundments

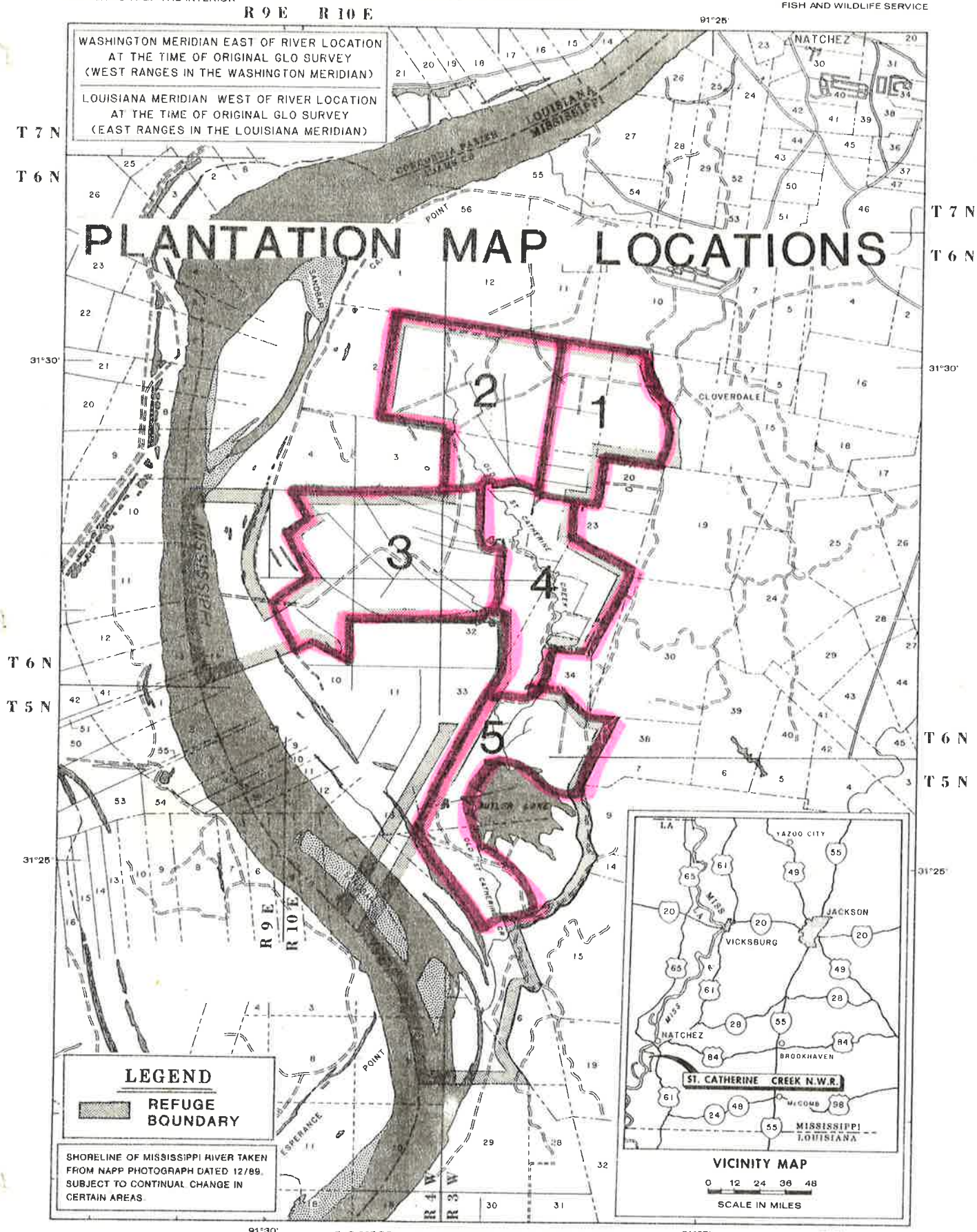
Cooperative Farming Program

ST. CATHERINE CREEK NATIONAL WILDLIFE REFUGE

UNITED STATES
DEPARTMENT OF THE INTERIOR

ADAMS COUNTY, MISSISSIPPI

UNITED STATES
FISH AND WILDLIFE SERVICE



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3°05'
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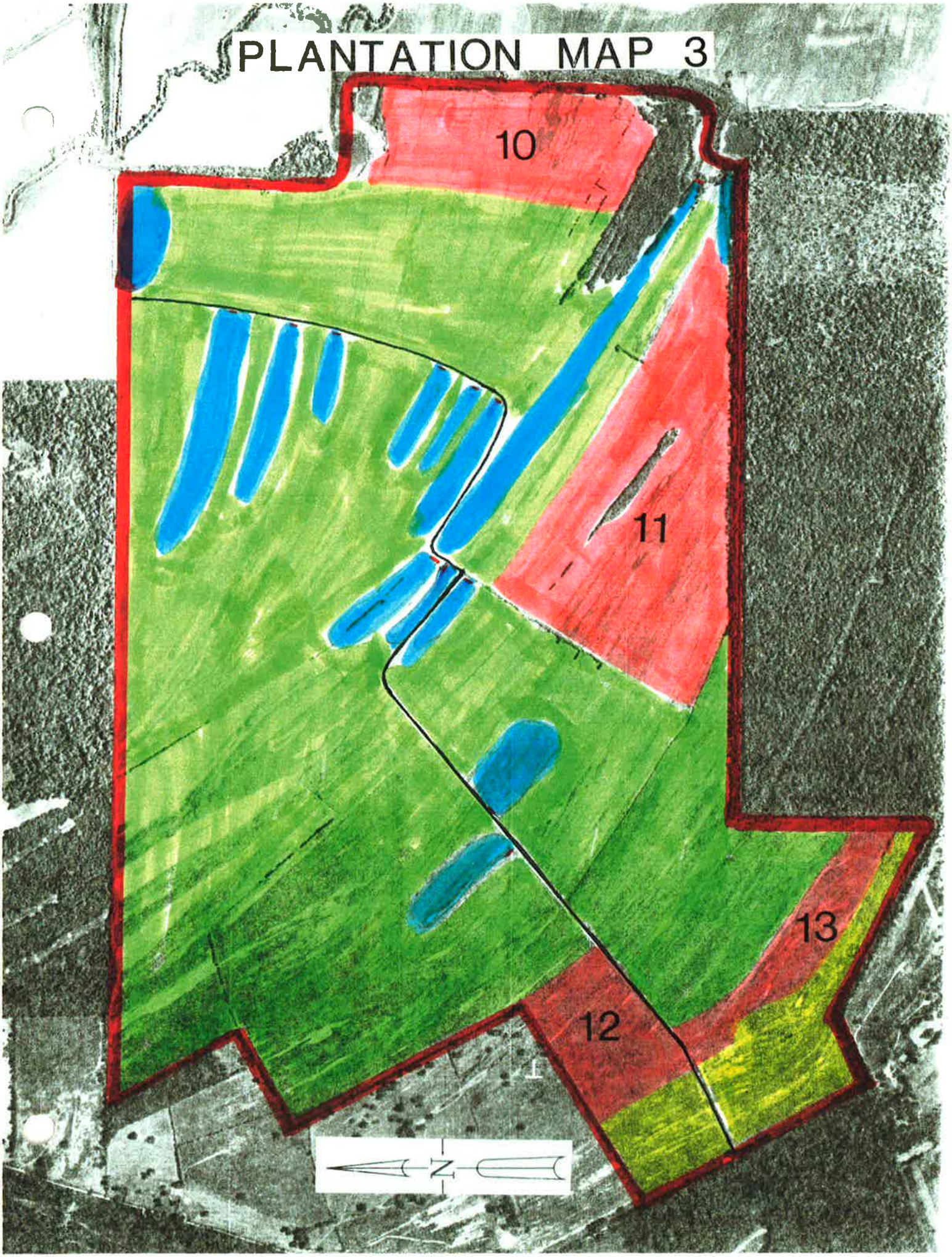
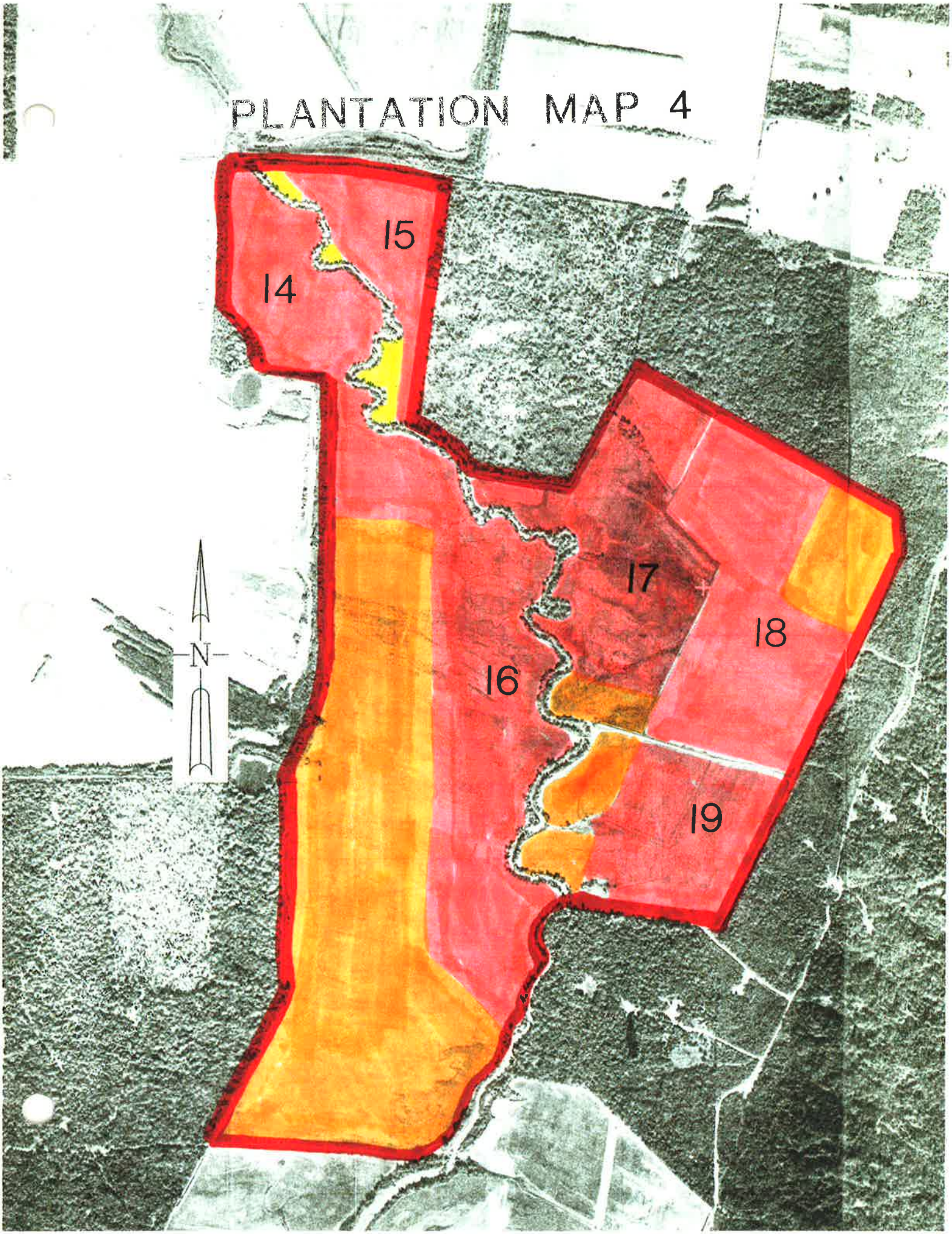
ATLANTA, GEORGIA AUGUST, 1989

PLANTATION MAP 1

PLANTATION MAP 2

PLANTATION MAP 3




PLANTATION MAP 4
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PLANTATION MAP 5