

U.S. Fish & Wildlife Service

# National Wildlife Refuge System

## FIG COMMISSION 7

### Cadastre & Land Management

Madison, Wisconsin - June 2005



# Department of the Interior

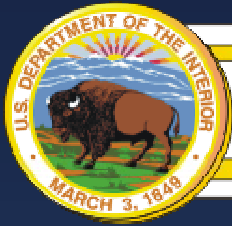
## 1849 Creation of the Home (Interior) Department

### Consolidated

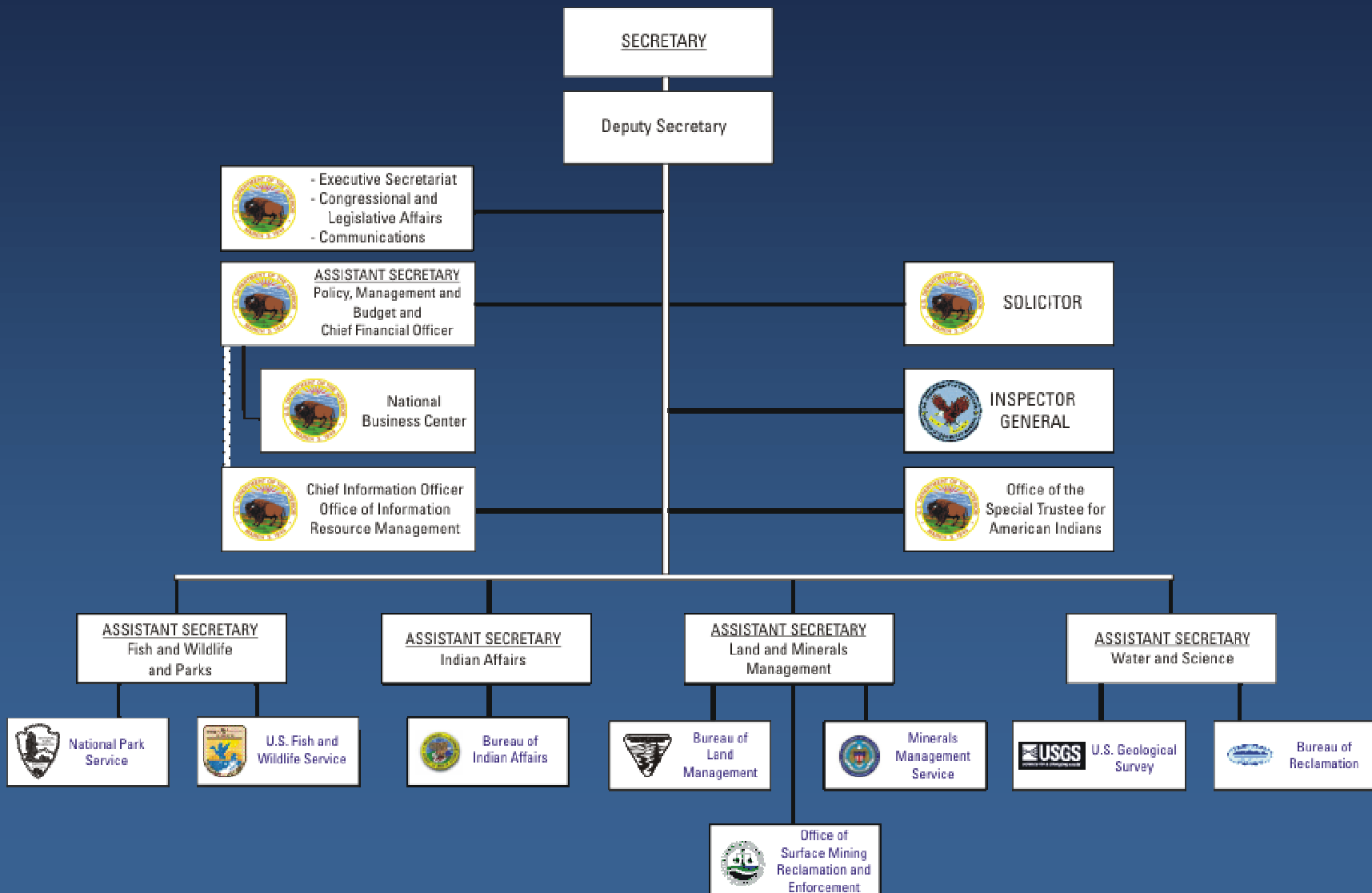
- n **General Land Office (Department of the Treasury)**
- n **Patent Office (Department of State)**
- n **Indian Affairs Office (War Department)**
- n **Military Pension Offices (War and Navy Departments)**

The Department of the Interior (DOI) is the nation's principal conservation agency.

Our mission is to protect America's treasures for future generations, provide access to our nation's natural and cultural heritage, offer recreation opportunities, honor our trust responsibilities to American Indians and Alaska Natives and our responsibilities to island communities, conduct scientific research, provide wise stewardship of energy and mineral resources, foster sound use of land and water resources, and conserve and protect fish and wildlife.



# U.S. Department of the Interior



Interior is a large, decentralized agency with over **70,600** employees and **200,000** volunteers located at approximately **2,400** operating locations across the United States, Puerto Rico, U.S. territories, and freely associated states.

We discharge our responsibilities on a **\$16.212** billion total annual budget. DOI raises more than **\$10** billion in revenues collected from energy, mineral, grazing, timber, recreation, land sales, etc.

DOI manages 504 million acres of surface land, or about one-fifth of the land in the United States.

## Acreage Managed

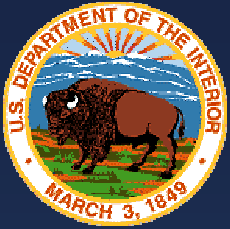
- n 261.9 million acres managed by the Bureau of Land Management
- n 96.1 million acres managed by the Fish and Wildlife Service
- n 84.4 million acres managed by the National Park Service
- n 8.7 million acres managed by the Bureau of Reclamation
- n 55.7 million acres managed by the Bureau of Indian Affairs

**1940 U.S. Fish and Wildlife Service created**

**n Bureau of Fisheries**

**n Bureau of Biological Survey**





U.S. Fish & Wildlife Service

# National Wildlife Refuge System

## Mission

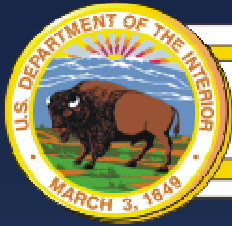
"To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans."

**1946 Bureau of Land Management created**

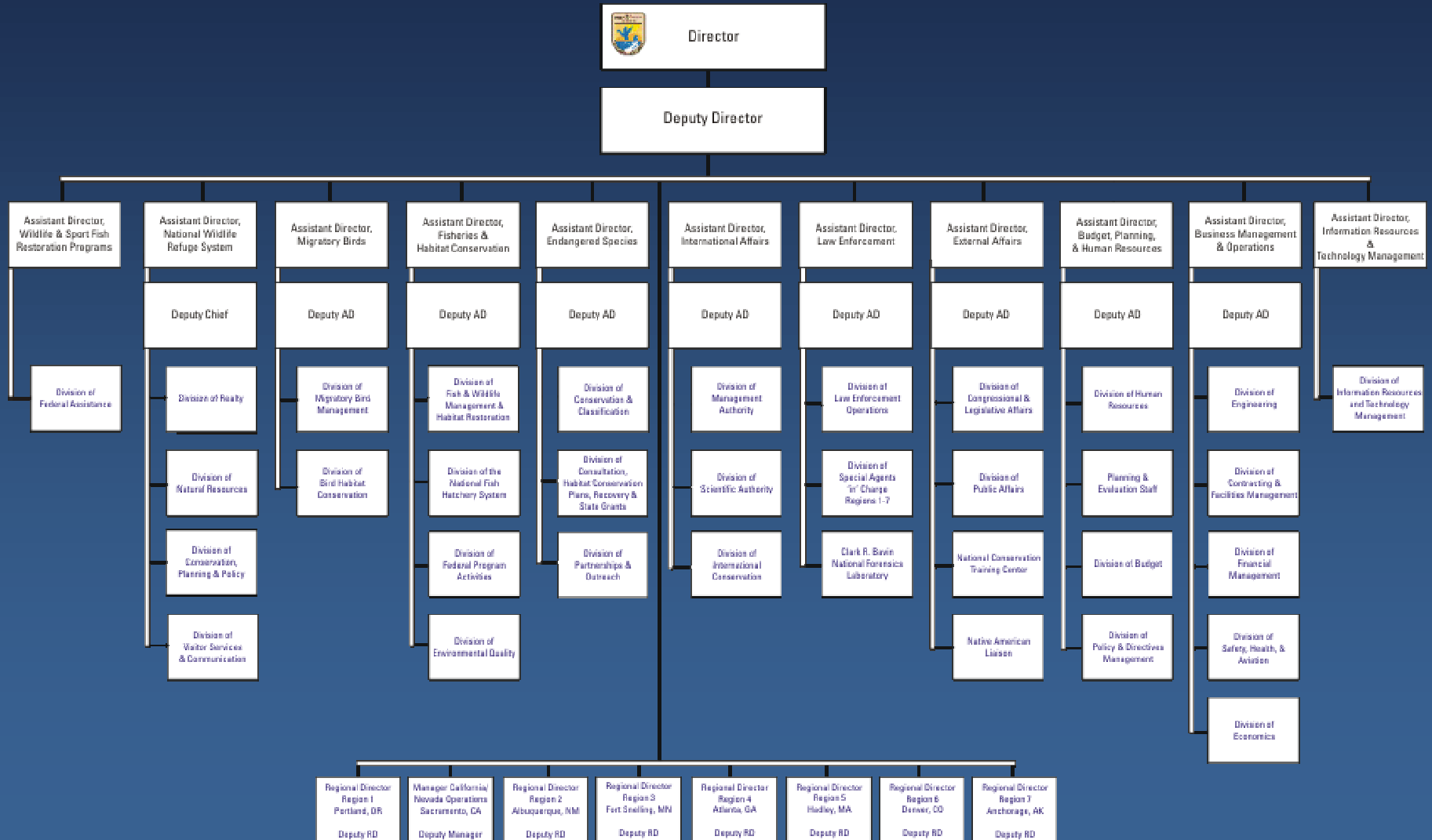
**n General Land Office**

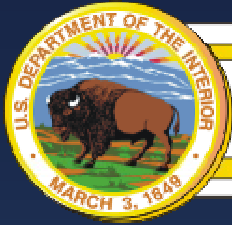
**n Grazing Service**

The Bureau of Land Management (BLM) manages 261.9 million acres of America's public lands, located primarily in 12 Western States. The agency manages an additional 300 million acres of below ground mineral estate throughout the country. The BLM sustains the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

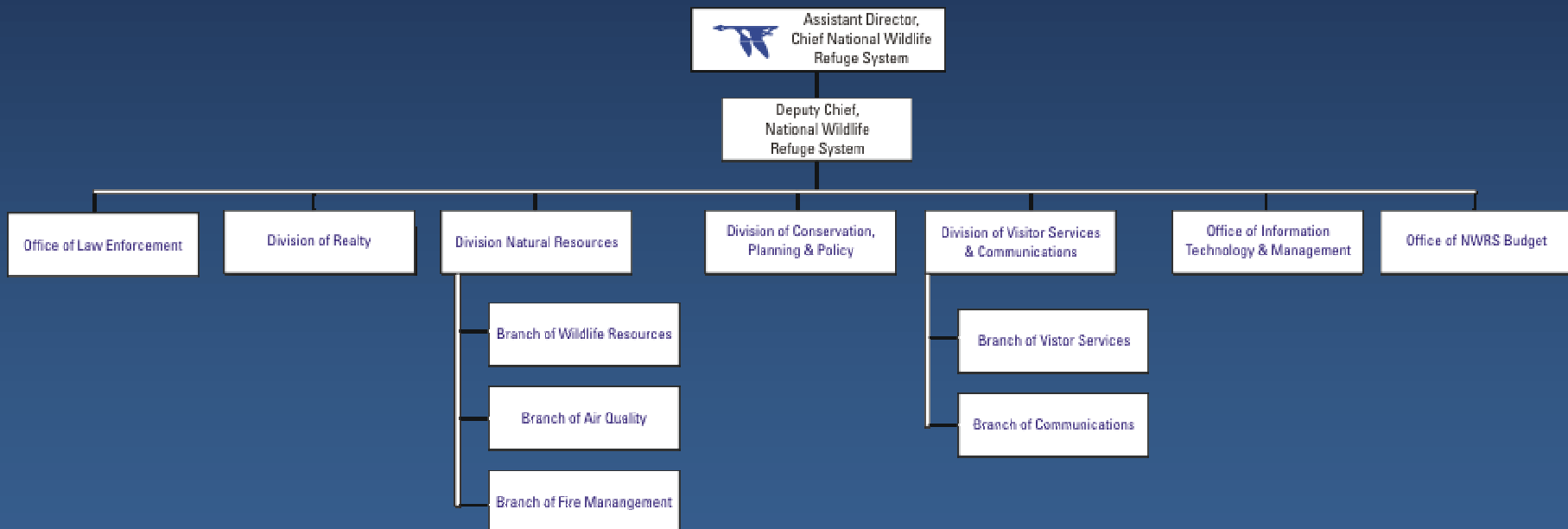


# Fish & Wildlife Service

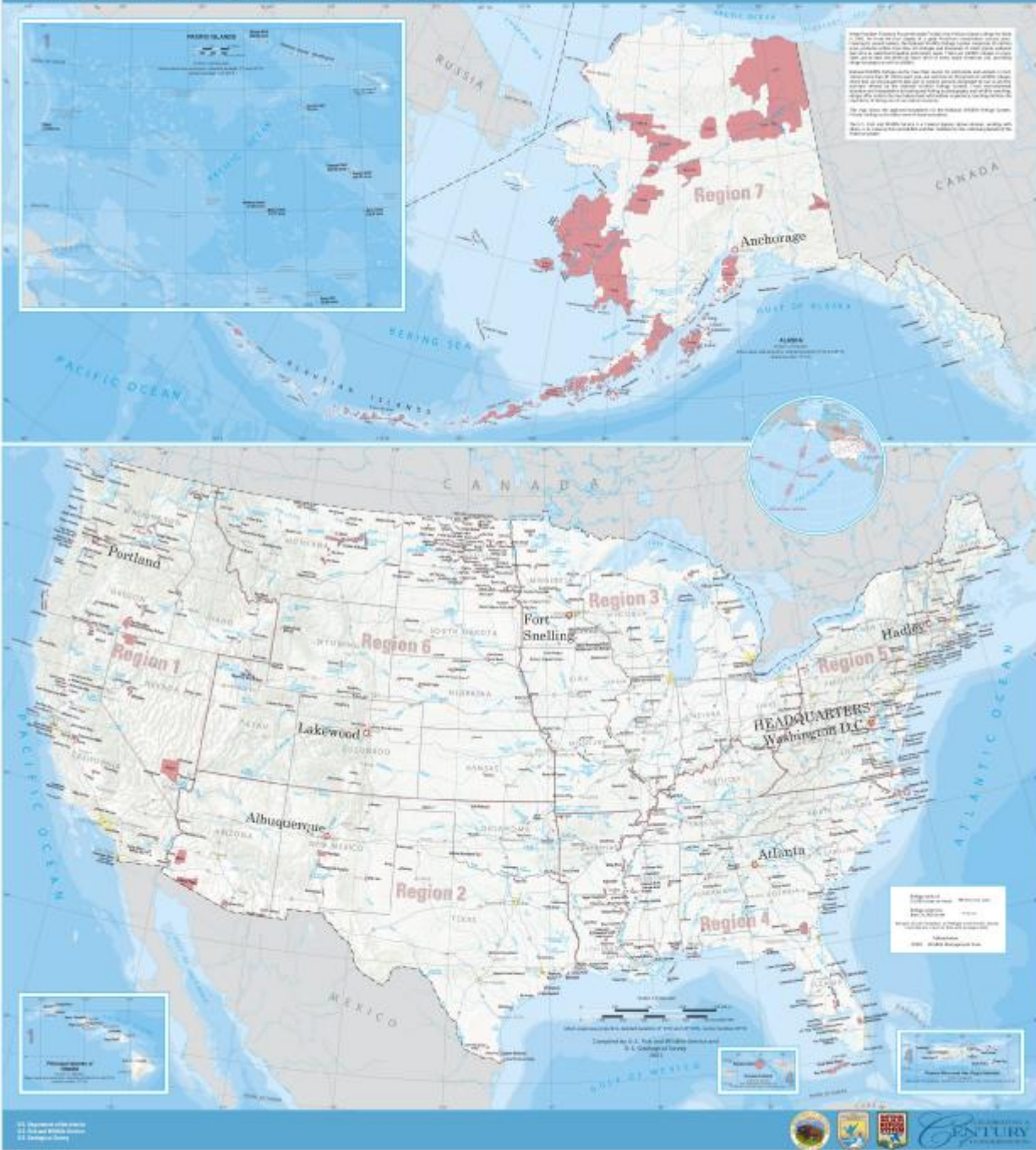


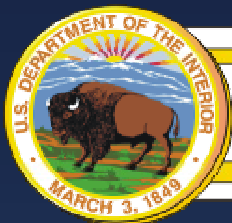


# National Wildlife Refuge System

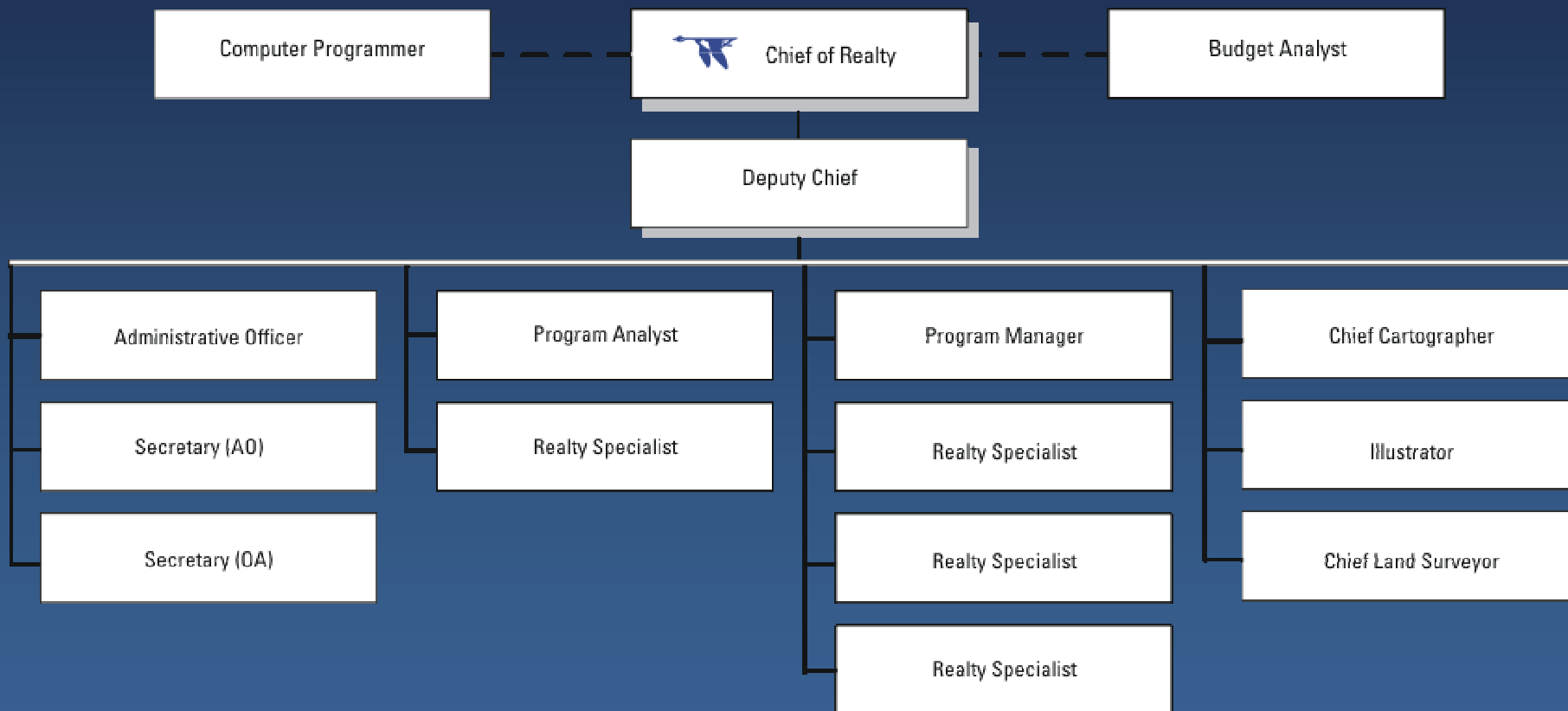


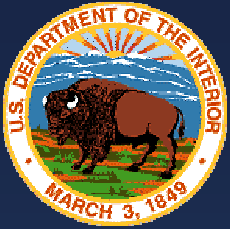
# NATIONAL WILDLIFE REFUGE SYSTEM





# Division of Realty - Washington Office





U.S. Fish & Wildlife Service

# National Wildlife Refuge System

n **Refuge System features:**

n **545 National Wildlife Refuges (NWR)**

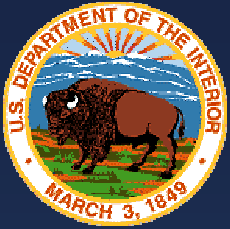
l **Nearly 100 million acres essential to the survival of wildlife**

n **36 Wetland Management Districts (WMD)**

l **Administrative offices responsible for management of Waterfowl Production Areas, wetland easements, and easement refuges.**





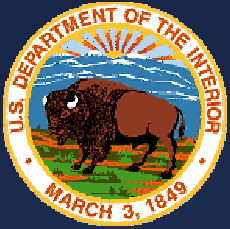


U.S. Fish & Wildlife Service

# National Wildlife Refuge System

## ACREAGE

<b>545 Refuges</b>	<b>92,665,972</b>
<b>203 Waterfowl Production Area Counties</b>	<b>3,134,305</b>
<b>50 Coordination Areas</b>	<b>315,824</b>
<b>Total Acres</b>	<b>96,116,101</b>



U.S. Fish & Wildlife Service

# National Wildlife Refuge System

## 33,000 Waterfowl Production Areas (203 Counties)



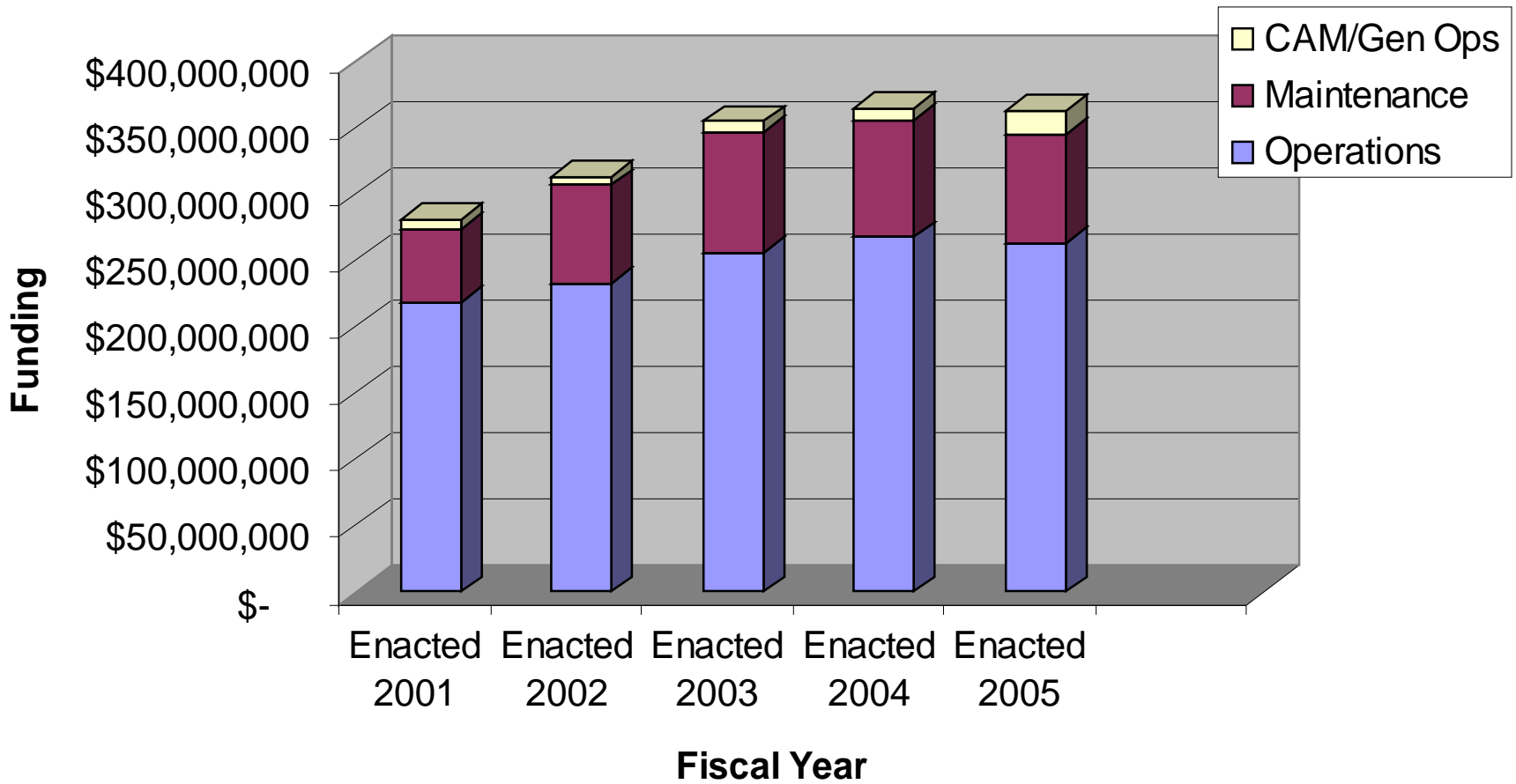
- | Wetland or pothole areas (Dakotas, Minnesota, and Montana) acquired under the Migratory Bird Hunting and Conservation Stamp Act or other statutory authority
- | 3,000 are Federally owned and 30,000 are easements secured from private landowners

# Land Acquisition Policy

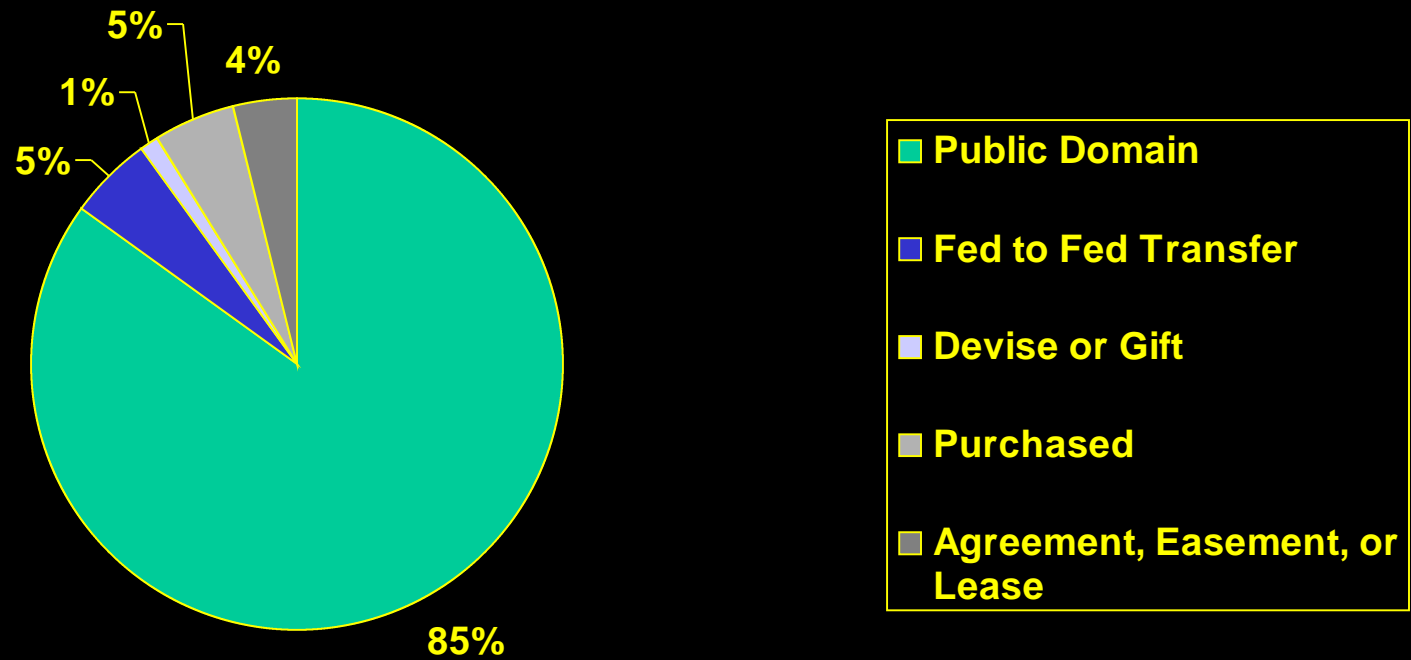
Acquire land only when other means, such as zoning or regulation, of achieving program goals and objectives are not appropriate, available, or effective.

When lands are to be acquired, the minimum interest necessary to reach management objectives is to be acquired or retained.

# NWRS



### Acquisition Methods-All acres



## GUINDON



*"Let's divide the earth up in little squares and sell them."*

# Know Your Bounds!

**You cannot manage land unless you know where it is located on the face of the earth.**



# System of Surveys

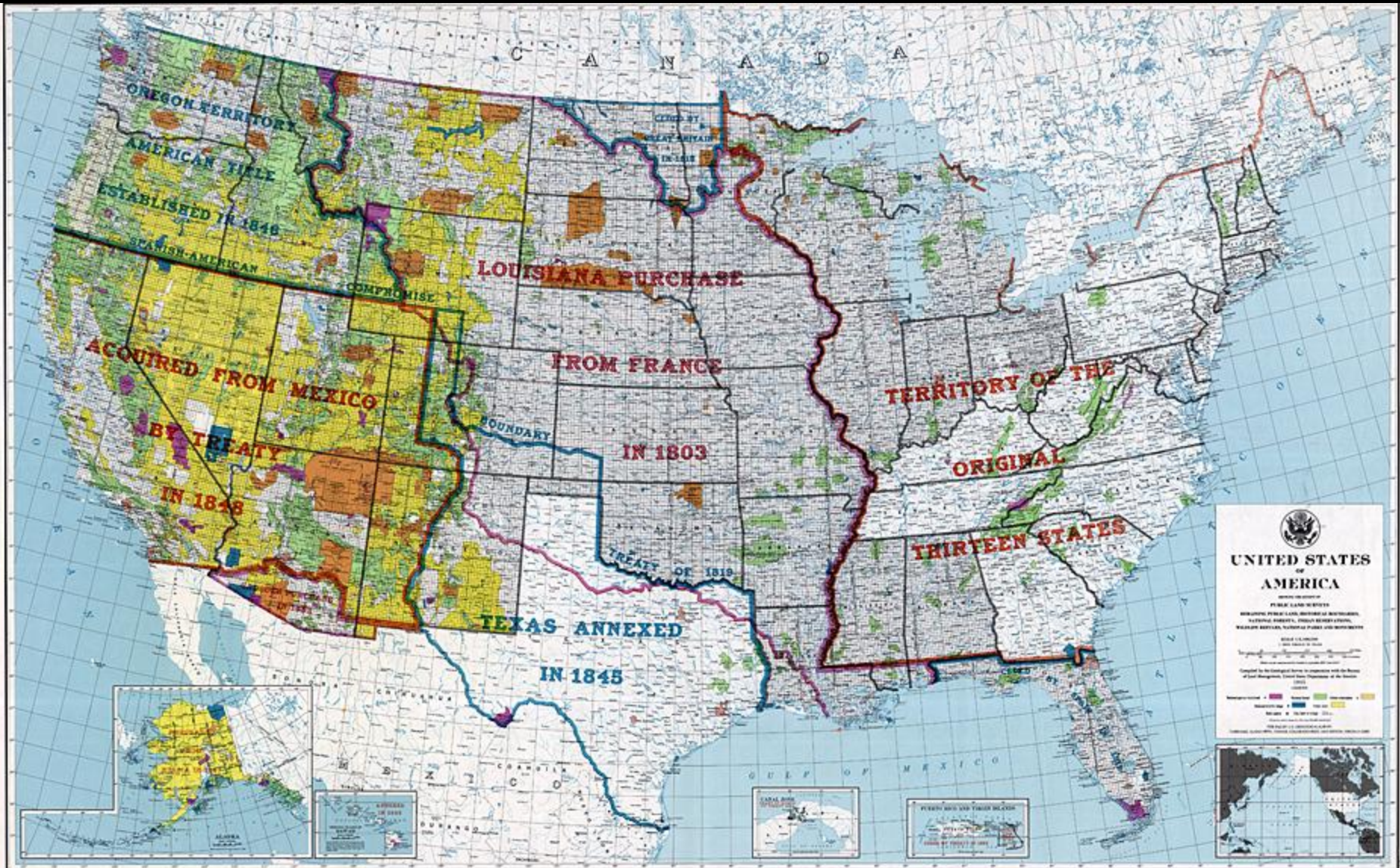
## n Metes and Bounds Survey

irregular shaped tract of land

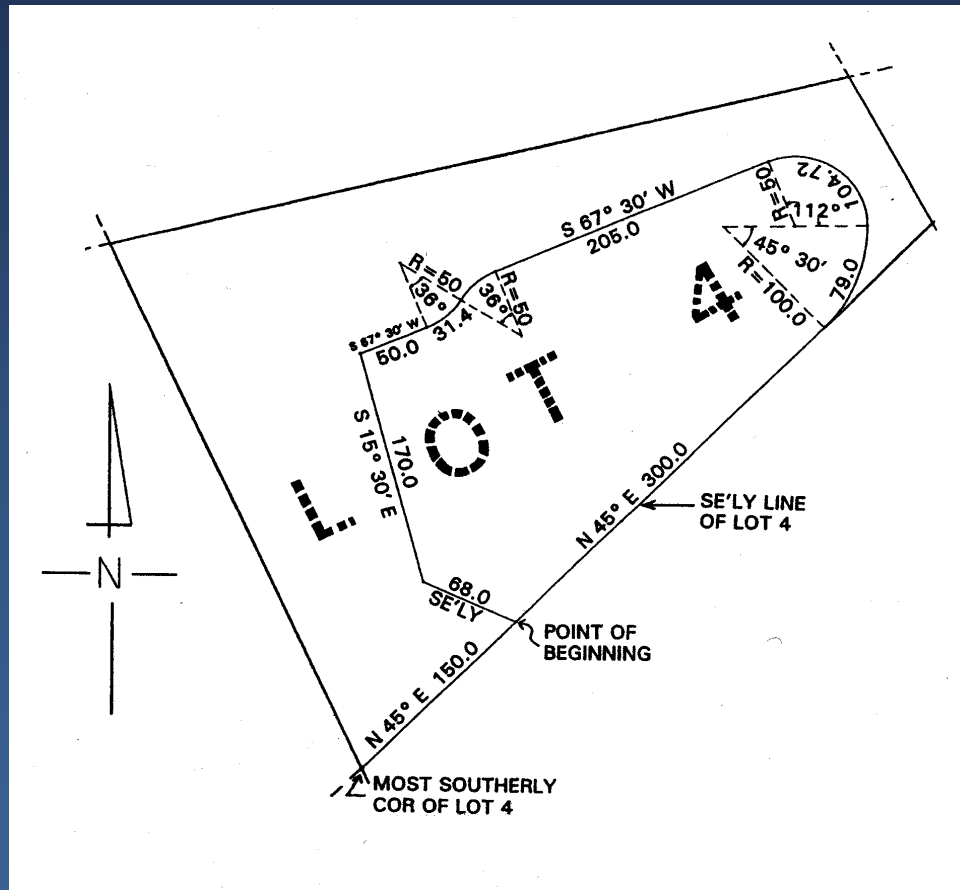
## n Rectangular Survey

form is generally square shaped





# Metes and Bounds Surveys



# Rectangular Survey

4028 4028	80	30.15	4007	60
4032 4034 4036 4038	80 80 80 80	30 60.00 30 60.00	4007 4007	60
4036 4038 4040 4042	80 80 80 80	30 60.00 30 60.00	4007 4007	60
4046 4048 4050 4052	80 80 80 80	30 60.00 30 60.00	4007 4007	60

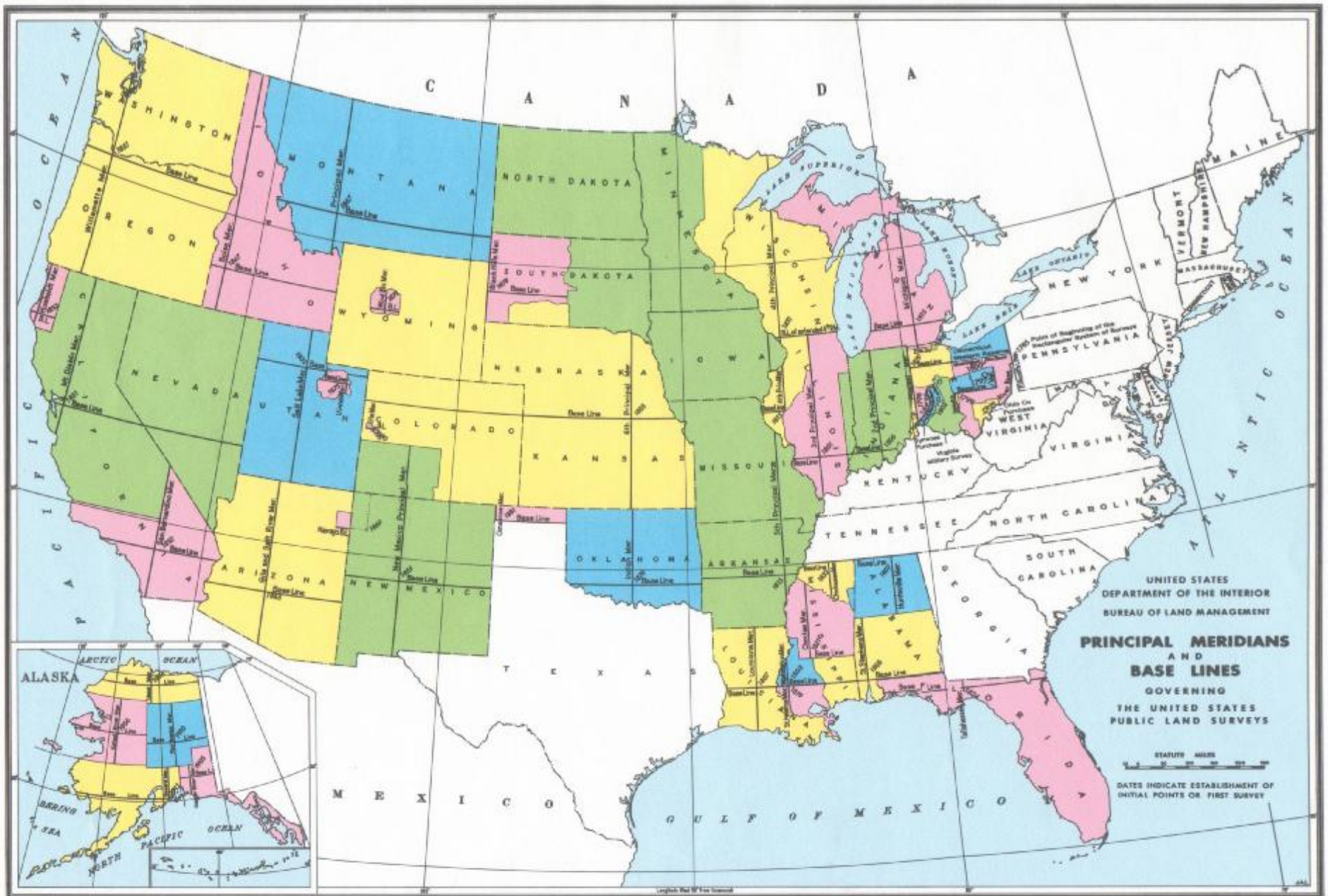
Vertical line labels: B. 10. 10. B, B. 10. 10. B, B. 10. 10. B, B. 10. 10. B

Horizontal line labels: 30.21, 30.21

Section labels: SEC 30, SEC 20, SEC 30, SEC 20, SEC 30, SEC 20, SEC 30, SEC 20

Other labels: 160, 160, 160, 160, 160, 160, 160, 160





INTERIOR, GEOLOGICAL SURVEY, RESTON, VIRGINIA, 1988

# Units of Measure



# Linear Measurement

**1 Chain = 100 Links or 66 Feet**

**1 Mile = 80 Chains or 5,280 Feet**

**1 Mile = 1.61 Kilometers**

# Area Measurement

**1 Acre = 10 Square Chains or 43,560  
Square Feet**

**1 Square Mile = 640 Acres**

**2.47 Acres = 1 Hectare**

# Basis of Bearing

(Direction)

Astronomic

Bearing or Azimuth





# Directions or Bearings

- n **Angular deviation measured in degrees, minutes and seconds from a known line or direction, usually north or south**
- n **True Meridian is due north and south**
- n **True Latitude is due east and west**

**Example: N. 45° 45' 45" W.**

**S. 23° 30' 30" E.**







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# Region 3

Total NWR's = 53

Total acreage = 1,312,410 (1.3 %)

Total NWR's with digital boundaries = 53

Total NWR's with digital land status = 53



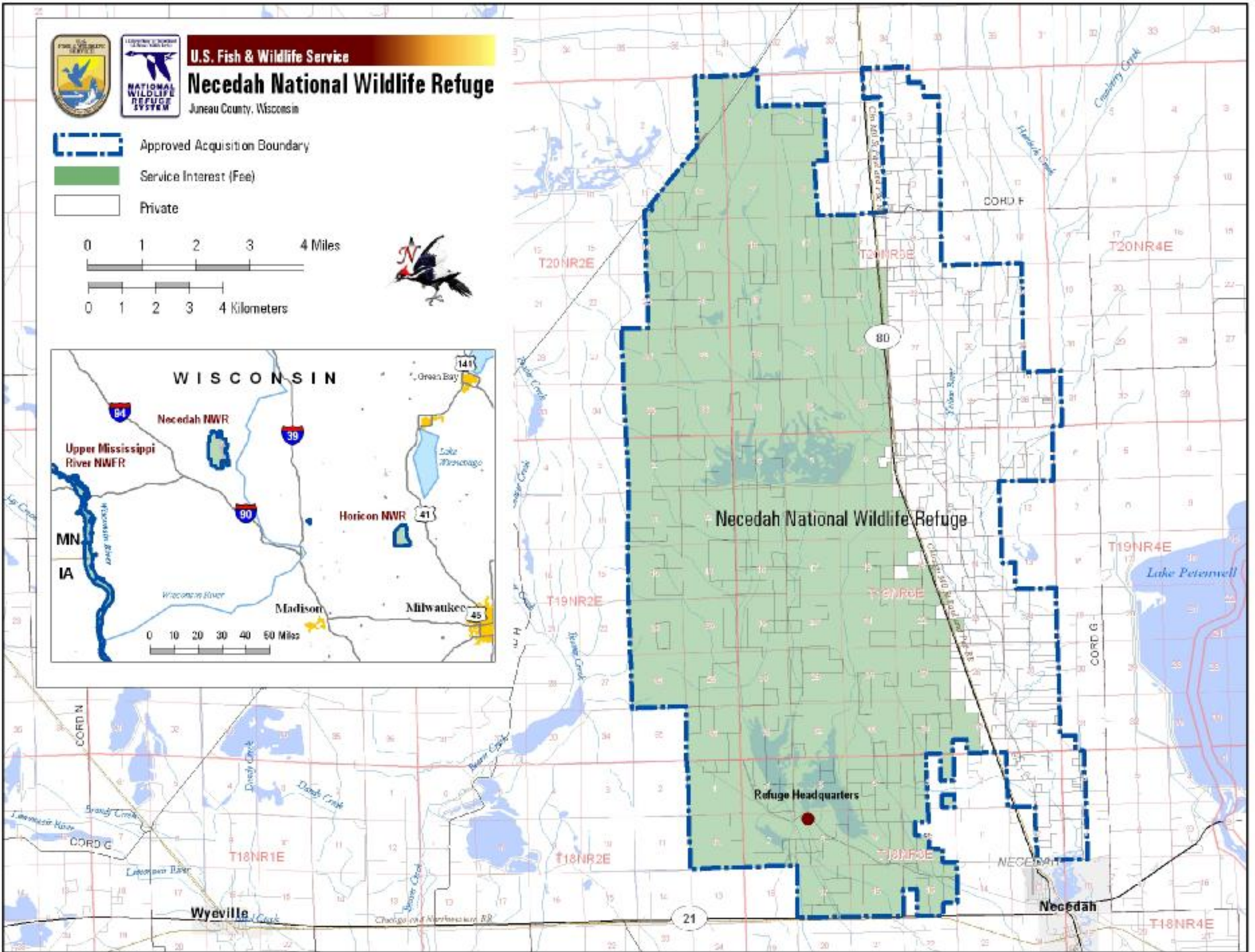




**U.S. Fish & Wildlife Service**  
**Necedah National Wildlife Refuge**

Juneau County, Wisconsin

-  Approved Acquisition Boundary
-  Service Interest (Fee)
-  Private



## Necedah National Wildlife Refuge



Whooping cranes, wolves, Karner blue butterflies, and white-tailed deer call Necedah National Wildlife Refuge "home." Ringed bog hunter dragonflies live in sedge meadows, flying squirrels in upland hardwood timber. Trumpeter swans inhabit the marshes, and badgers the savanna.

The refuge hosts a wealth of wildlife resources, including such endangered and threatened species as bald eagles, whooping cranes, Karner blue butterflies, Blanding's turtles, and timber wolves.

The 43,656-acre refuge was established in 1939 as a refuge and breeding ground for migratory birds and other wildlife.

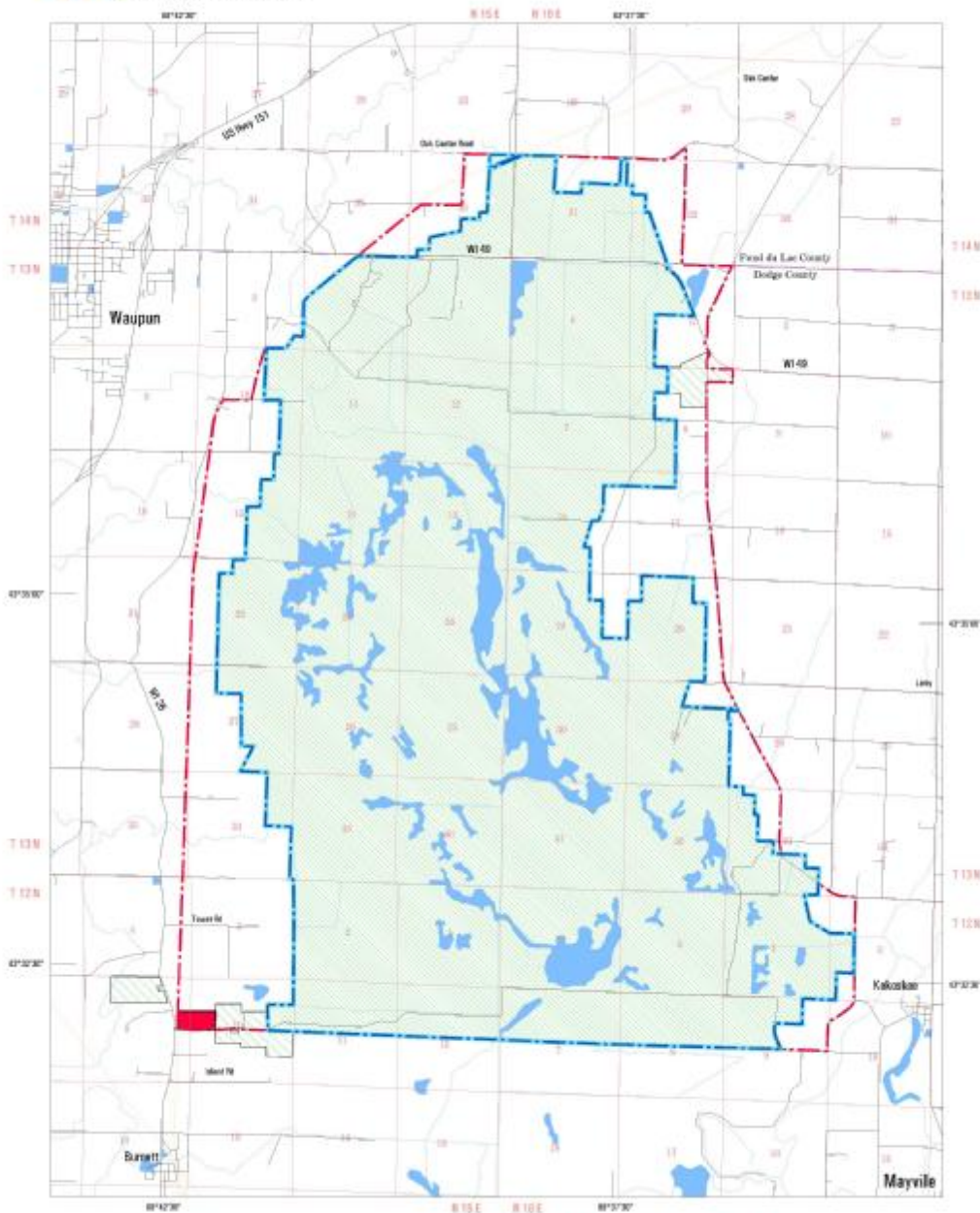


U.S. Fish & Wildlife Service

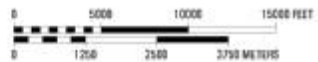
# Horicon National Wildlife Refuge

National Wildlife Refuge  
Forest of La Crosse and Dodge Counties, Wisconsin

Migratory Bird Conservation Commission



PRODUCED BY THE DIVISION OF REALTY  
STATE OF WISCONSIN  
DATE: 08/11/2010  
PROJECT: HORIZON NWR  
MAP DATE: 1/2009

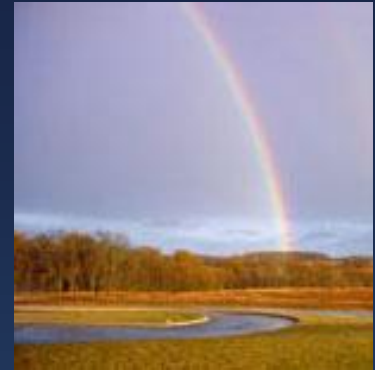


- Fee Approval - Fee
- Fee Approval - Boundary
- Previously Acquired - Fee
- MBCC Approved Boundary
- FWS - WPA
- Refuge (ownership) Boundary

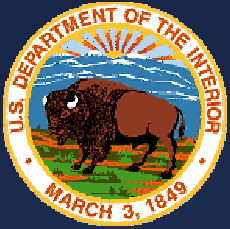




# Horicon National Wildlife Refuge



The Refuge consists of a vast hemi-marsh surrounded by upland grasses which supports over 223 species of birds and other diverse wildlife. A place of beauty and recreation, the Refuge hosts visitors, sportsmen, hikers and others interested in learning about wetlands. All visitors can feel the beauty of the outdoors and gain a sense of pride in this distinct Wetland of International Importance.



U.S. Fish & Wildlife Service

# National Wildlife Refuge System

## Digital Boundary and Digital Land Status Program

# Definition: digital land status

- Digital lines reflecting those parcels of land within the approved acquisition boundary in which the FWS has fee or less than fee interest.

## Also known as:

Refuge Boundary, Ownership Boundary, Parcel Layer

May also reflect privately owned lands within the approved acquisition boundary.

# Definition: digital boundary

- Digitized version of the **“approved acquisition”** boundary, which is the line(s) encompassing those lands that have been approved for acquisition by the FWS.

## Variety/Combinations of possible approvals:

Executive Order

Regional Director Approved

Public Land Order

Congressionally Approved

FWS Director Approved

MBCC, LWCF

# RLGIS

## Refuge Lands Geographic Information System



## What is RLGIS ?

Geodatabase in ArcGIS 9 to store core refuge level spatial data

GUI for reliable, consistent use

A model to operate as a template and tool to better serve inventory and monitoring efforts in the field and in turn, help implement management actions

## RLGIS Layers

- n Cadastral - boundary and survey information
- n Cultural Resources – archeological information
- n Facilities – constructed features
- n Transportation - infrastructure
- n Management Units – program administration units
- n Resource Management – management activities
- n Resource Inventory & Monitoring – habitat resources, invasive plants, contaminants
- n Hydrology – hydrologic features and water rights

## RLGIS Benefits

- n Staff movement from one station to another made more efficient
- n Easier backups
- n Development of common language
- n Support for mapping/analysis (CCP, LPP, etc)
- n Partners know what to expect

## RLGIS Benefits (con't)

- n Help contractors know what to expect

- n Aligns with “Field First” expectations

- n Improves data quality (validation rules)

- n Easier to support one model/method

- n Data collection more efficient (check in/out)

## RLGIS Challenges

- n One size does not fit all – station to station, region to region, many differences

- n Managing expectations

- n Users may need more than basic understanding of GIS

- n Effort growing too big (scope creep)

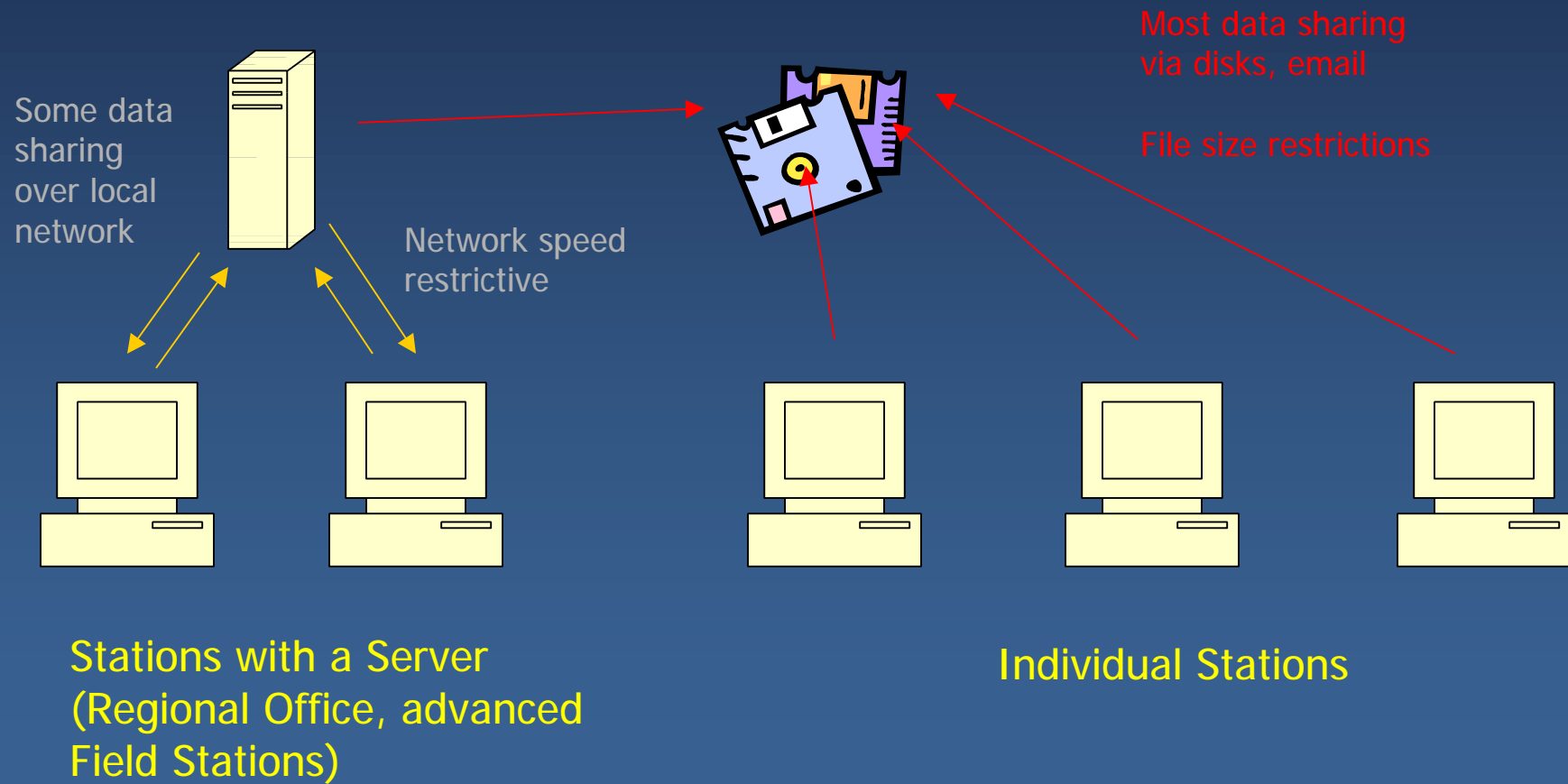
- n Effort growing too fast (lose focus)

ArcSDE

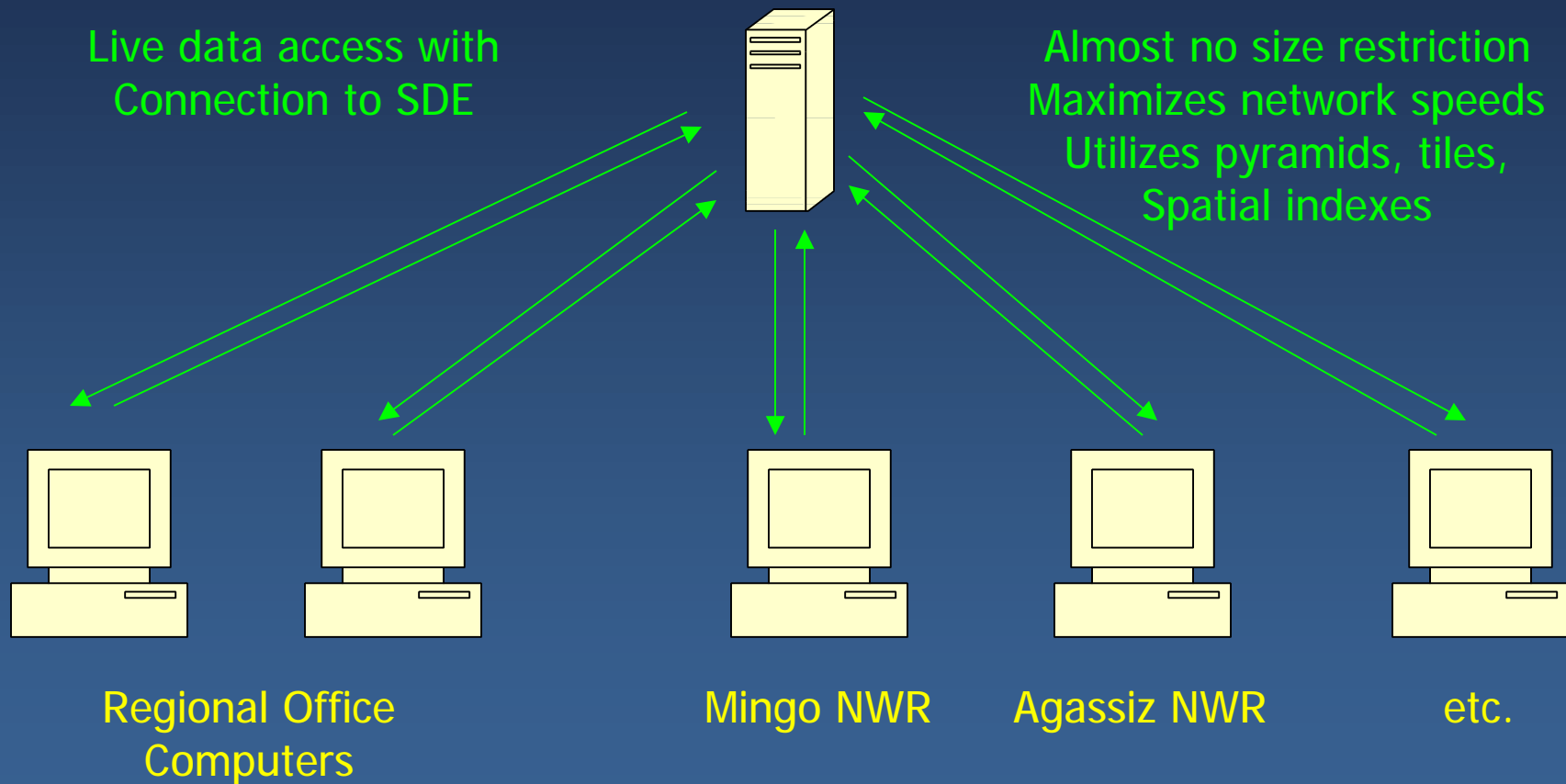
ESRI Spatial Database Engine

Benefiting GIS in Region 3

# Former Data Sharing



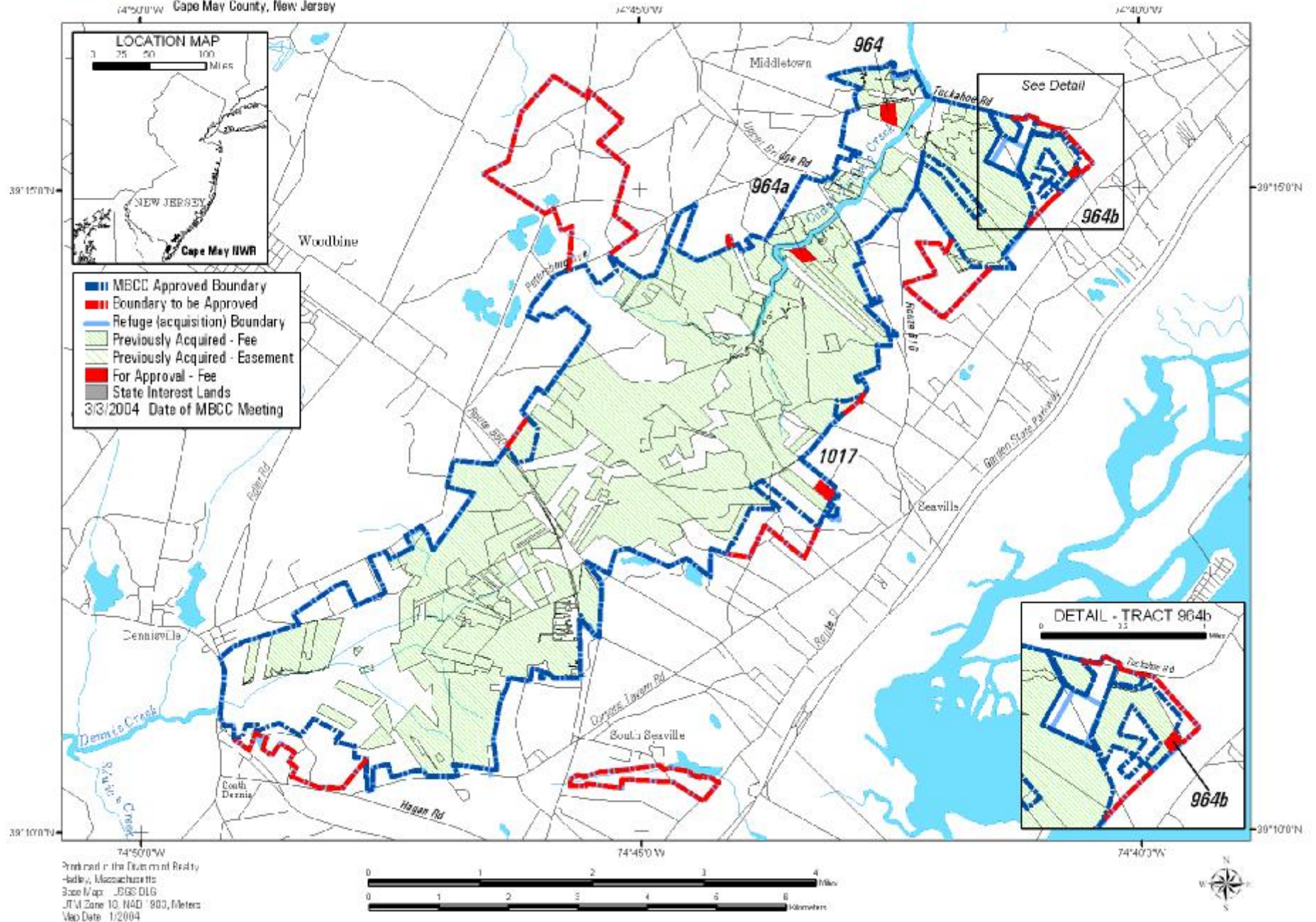
# ArcSDE Data Sharing





## Benefits of ArcSDE

- n Increased integrity of data
- n Increased availability of data
- n Field stations can focus on data improvement rather than data management
- n Cost reduction of data storing and sharing



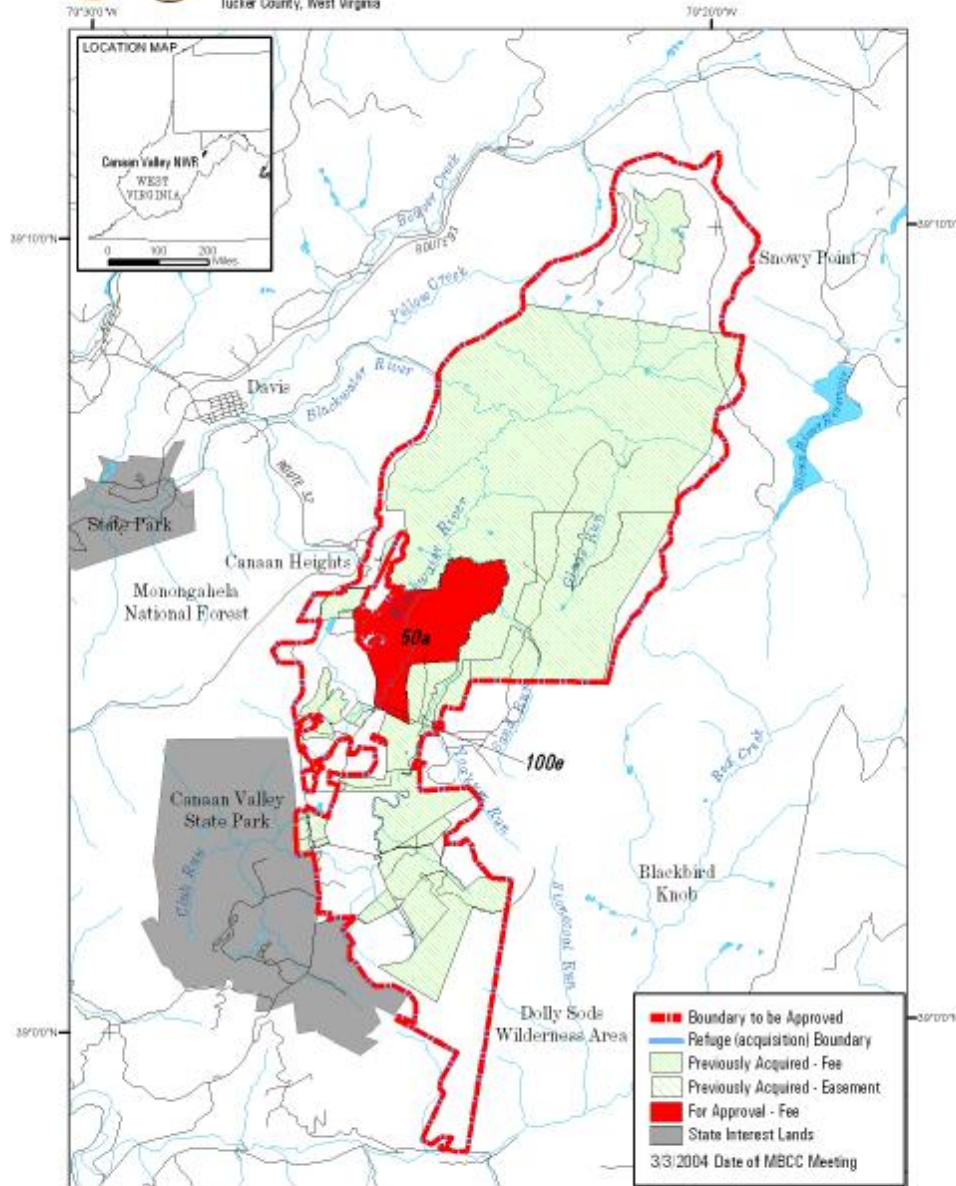
Printed in the Division of Realty  
-ville, Massachusetts  
Scale Map: JGGS DLG  
ITM Zone 18, NAD '83, Meters  
Map Date: 1/2004



# U.S. Fish & Wildlife Service

**Canaan Valley**  
National Wildlife Refuge  
Tucker County, West Virginia

Migratory Bird Conservation Commission



Produced by the Division of Realty  
Harris, Missouri  
Date/No. 1/20/04  
UTM Zone 17, FAD 9803, Metric  
Map Date: 1/20/04



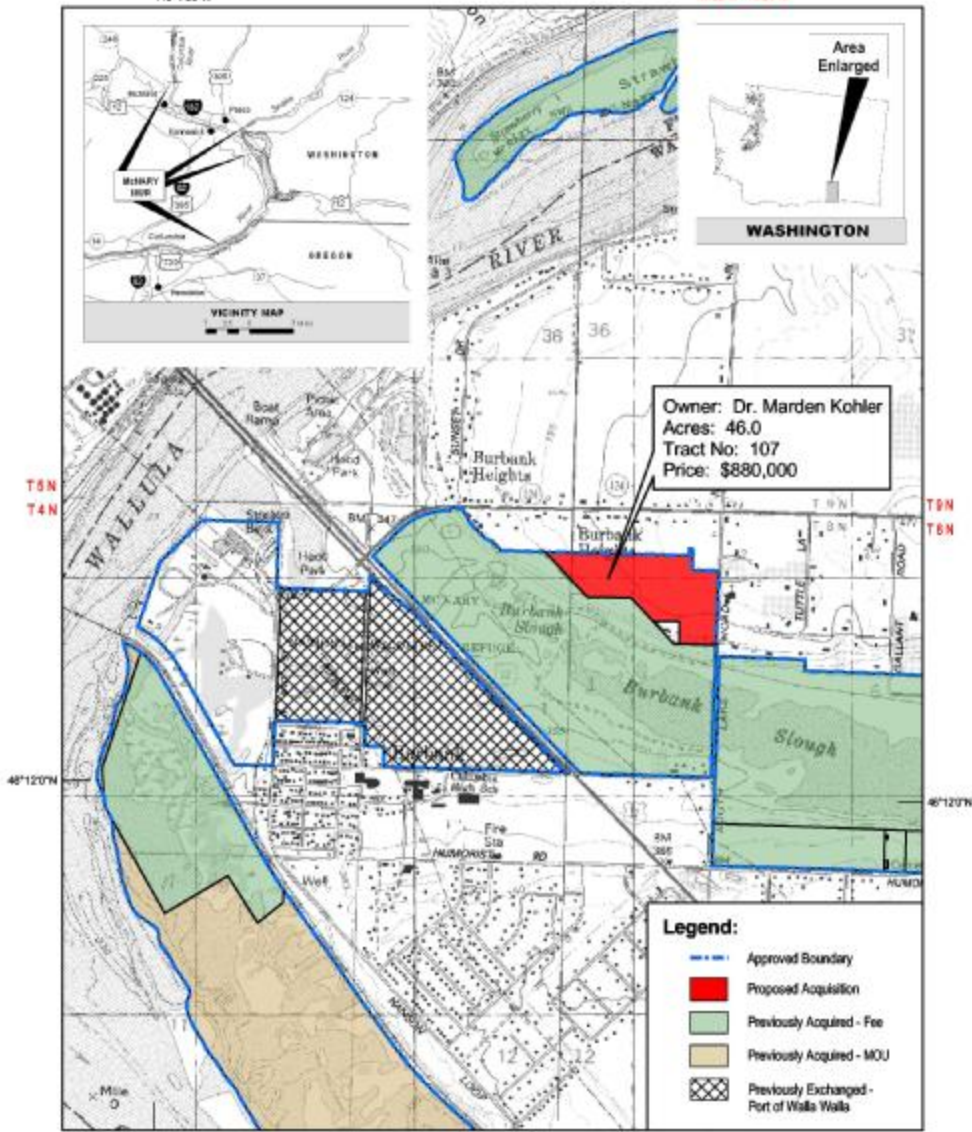


**U.S. Fish & Wildlife Service**  
**McNary National Wildlife Refuge**  
 Benton, Franklin and Walla Walla Counties, Washington

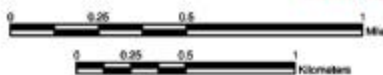
Emergency Fund Acquisition Request

119°130'W

R 30 E R 31 E



PRODUCED FOR THE DIVISION OF REALTY  
 PORTLAND, OREGON  
 MAP PROJECTION: NAD83, UTM ZONE 11N  
 GRAPHICAL UNITS: DECIMETERS, METERS, SECONDS  
 MAP GRID UNIT: METERS  
 ILLUMINATION: NERESMAN  
 PRODUCTION DATE: 01/09/04



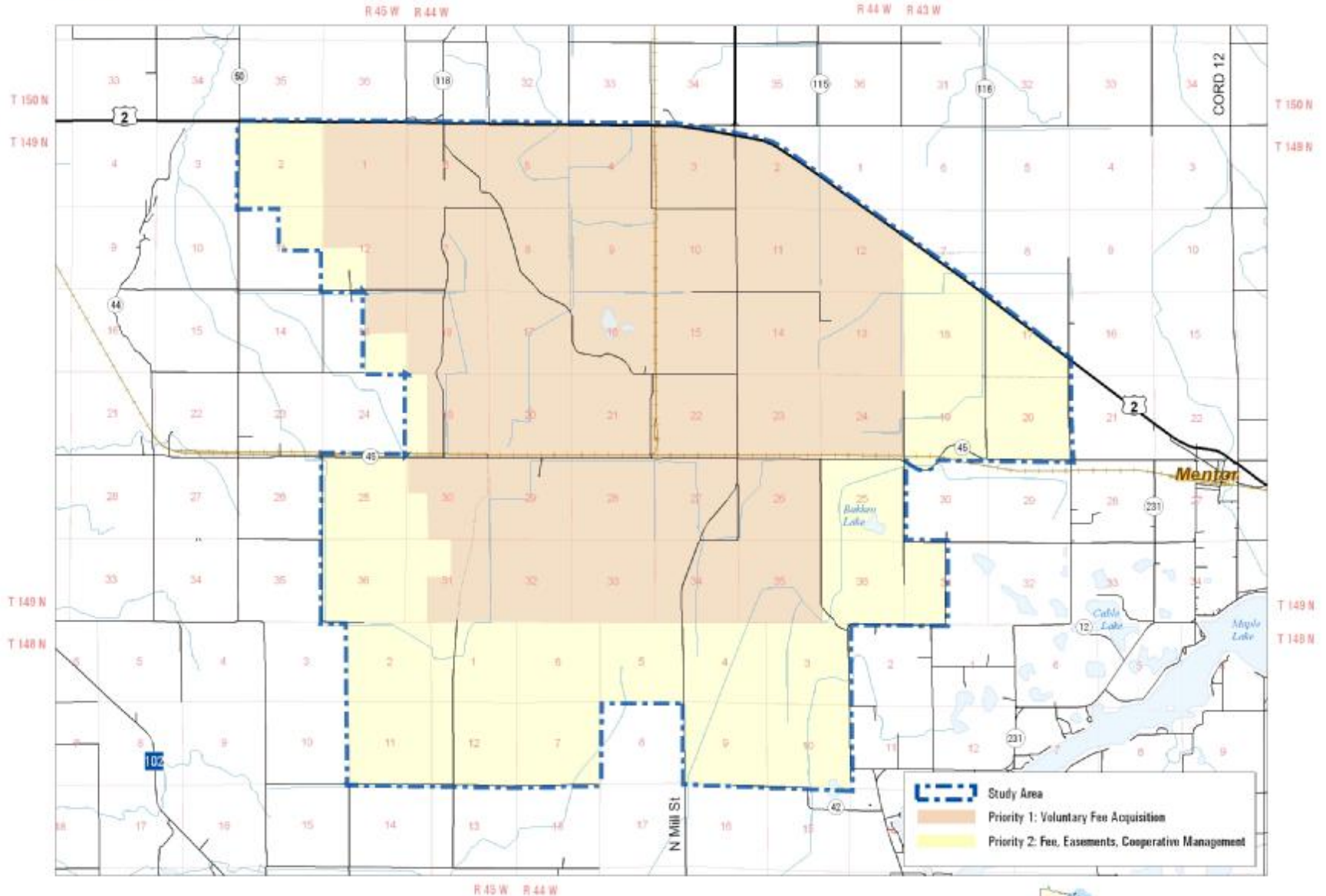


U.S. Fish & Wildlife Service

# Glacial Ridge National Wildlife Refuge

Polk County, Minnesota

Land Protection Priorities - Study Area



Produced in the Division of Realty  
Fort Snelling, MN  
Land Status Current to: 10/26/04  
Base Map Source: ESRI Streetmap



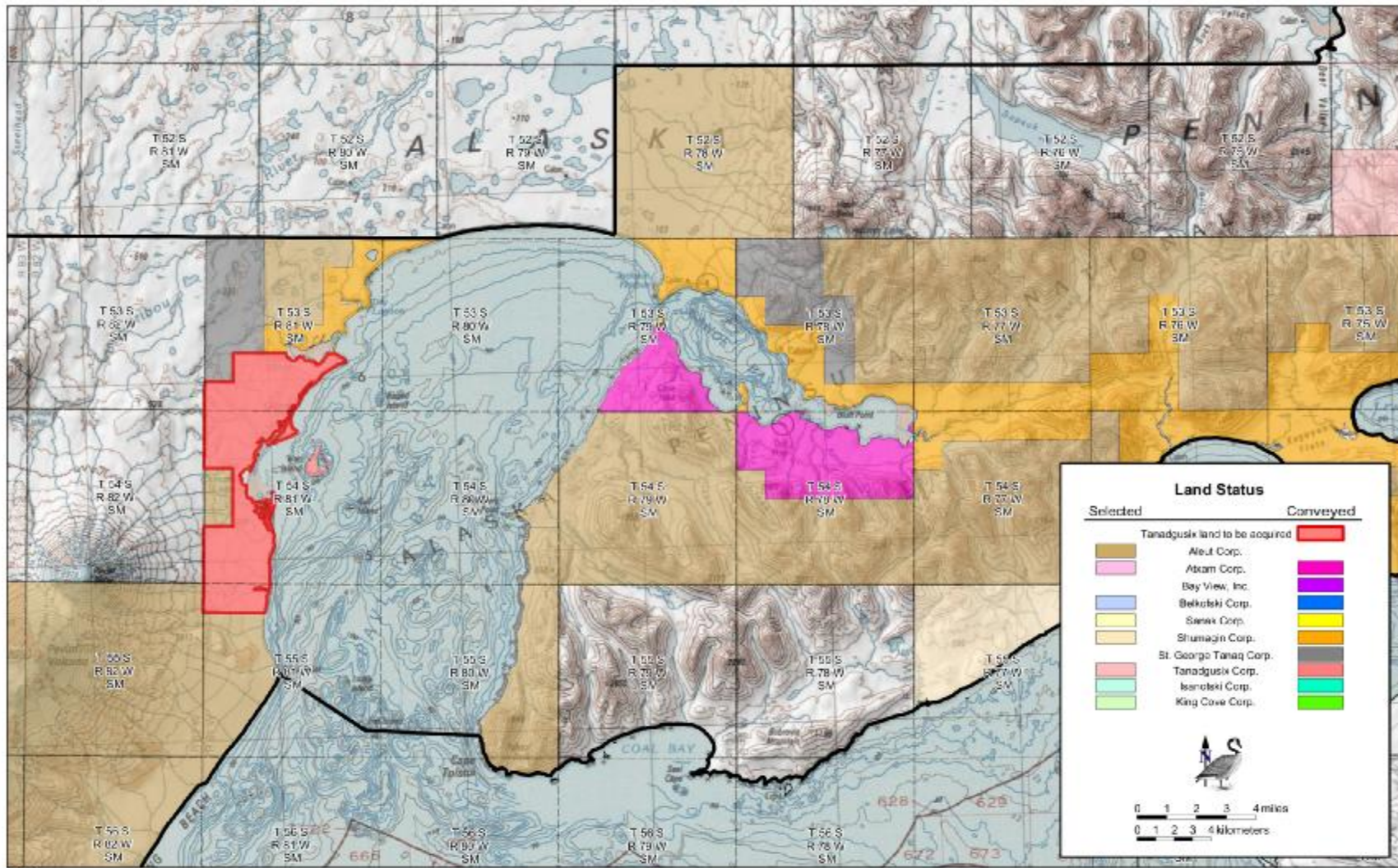




U.S. Fish & Wildlife Service

Tanadgusix Corporation Land Acquisition

Alaska Peninsula National Wildlife Refuge

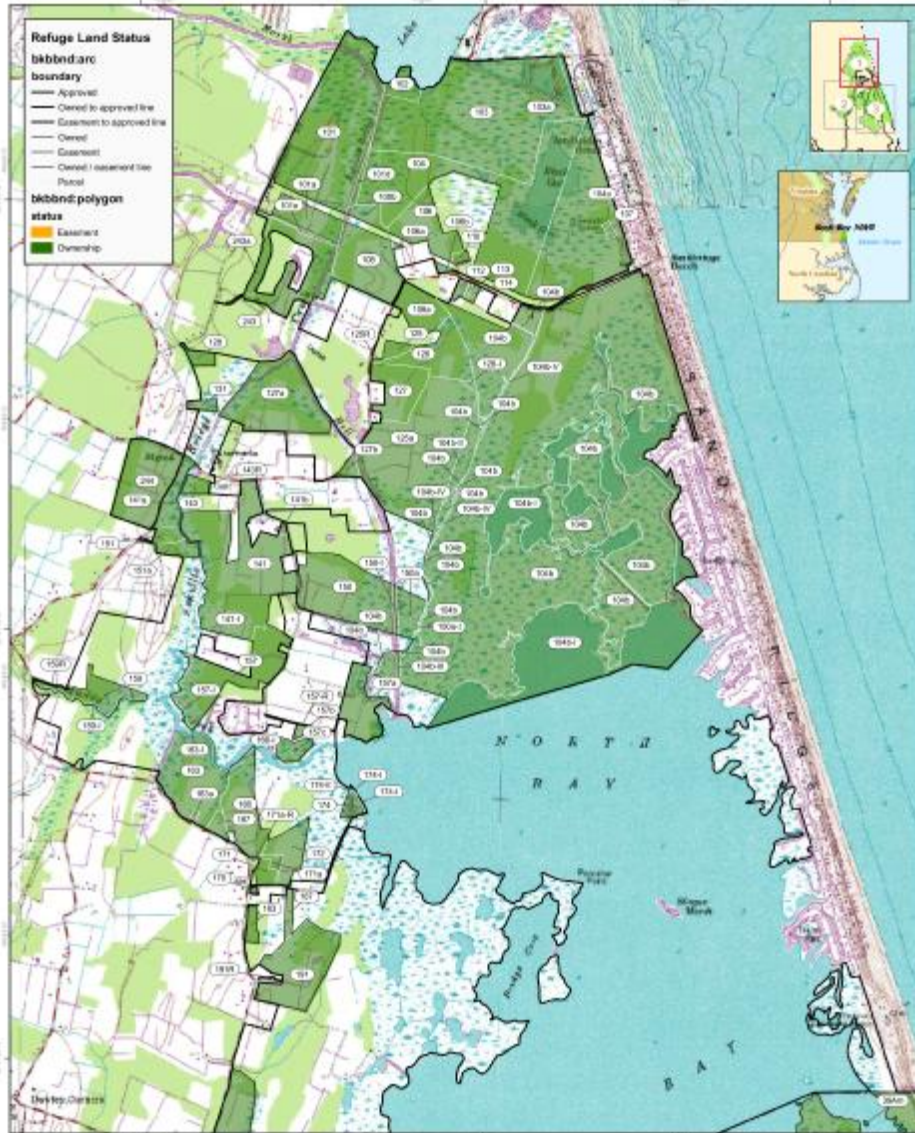






U.S. Fish & Wildlife Service  
Back Bay National Wildlife Refuge  
Virginia Beach, Virginia

Land Status Map 1 of 2



Prepared by Region 2 Office of Restoration  
Map Projection: NAD 83 UTM Zone 18N  
Scale: 1:25,000  
Date: 11/11/2011  
Author: [illegible]  
Editor: [illegible]  
Reviewer: [illegible]  
Approval: [illegible]



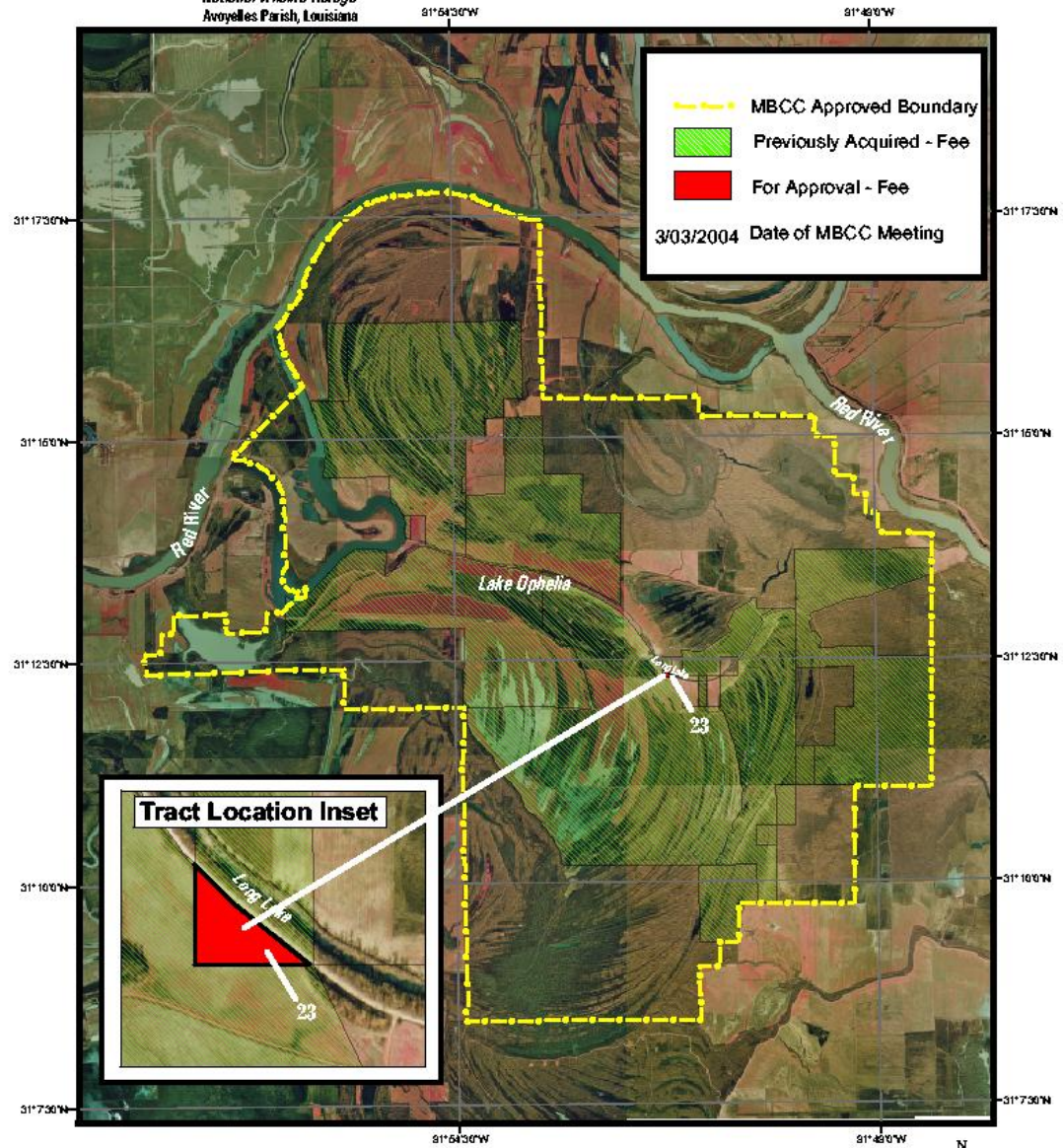
Revised to the 2011 1:25,000 topographic map  
All data were compiled from a 2011 aerial  
photo interpretation of the 2011 aerial photo



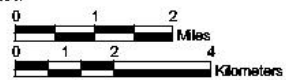
U.S. Fish and Wildlife Service

Lake Ophelia  
National Wildlife Refuge  
Avoyelles Parish, Louisiana

Migratory Bird Conservation Commission



Produced in The Division Of Realty  
Atlanta, Georgia  
Basemap: USGS DOQQ - 1999  
Map Date 1/2004

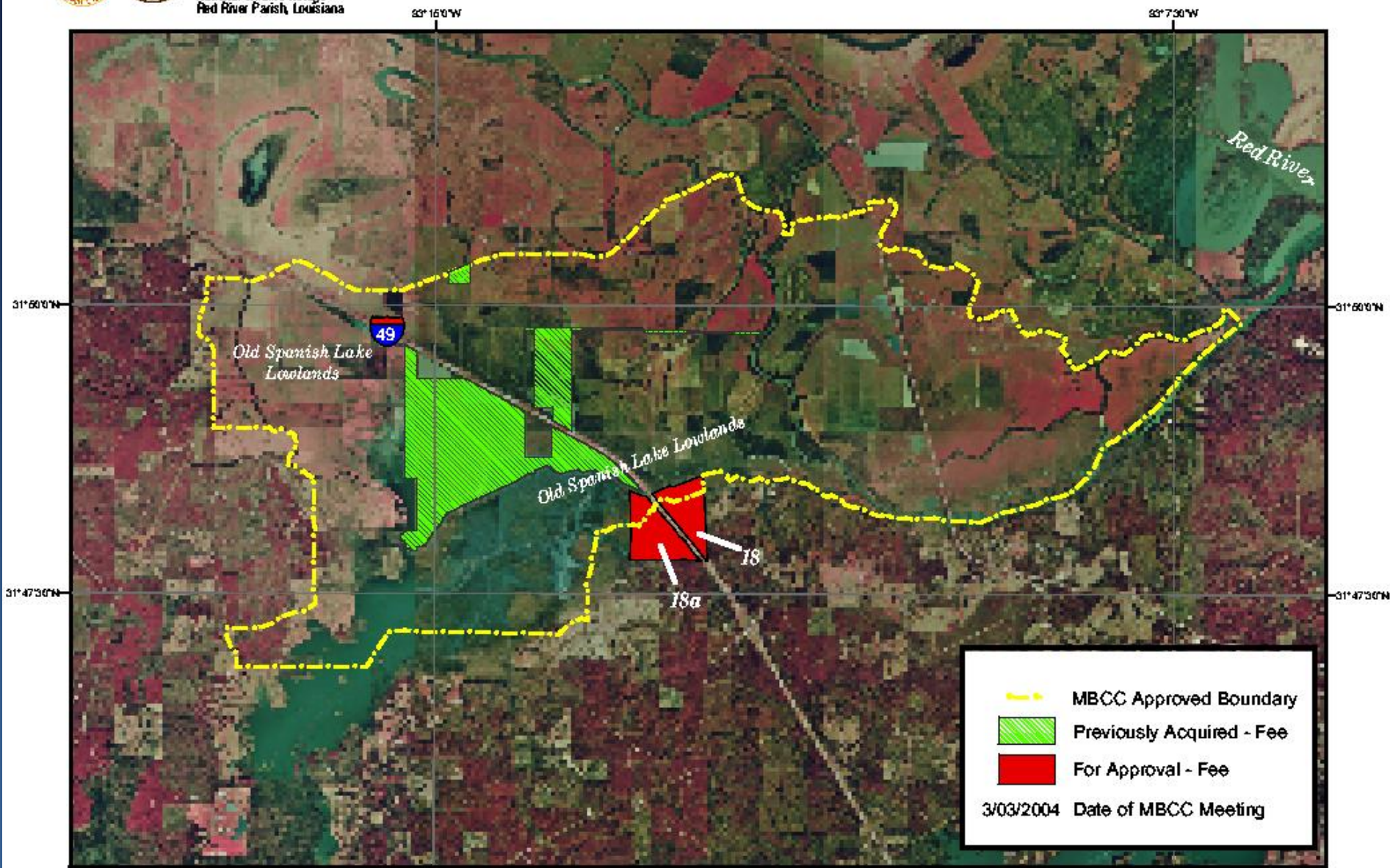






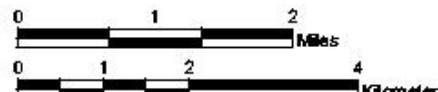
**U.S. Fish & Wildlife Service**  
**Red River - Spanish Lake Lowland Unit**  
*National Wildlife Refuge*  
 Red River Parish, Louisiana

*Migratory Bird Conservation Commission*



Produced in The Division Of Realty  
 Atlanta, Georgia  
 Base Map: USGS D000 - 1999

Map Scale: 1:25000







U.S. Fish & Wildlife Service

# Whittlesey Creek National Wildlife Refuge

Bayfield County, Wisconsin

R 29 E

T 40 N

T 40 N



R 29 E

Produced in the Division of Realty,  
Fort Snelling, Minnesota  
February 5th, 2004

2000 Color & 1982 B/W orthophoto base  
GIS People/Geodac



## FWS Cartographic Resources website

<http://realty.fws.gov/cartography.html>

## FWS Refuge Boundary website

<http://www.fws.gov/data/IMADS/index.htm>

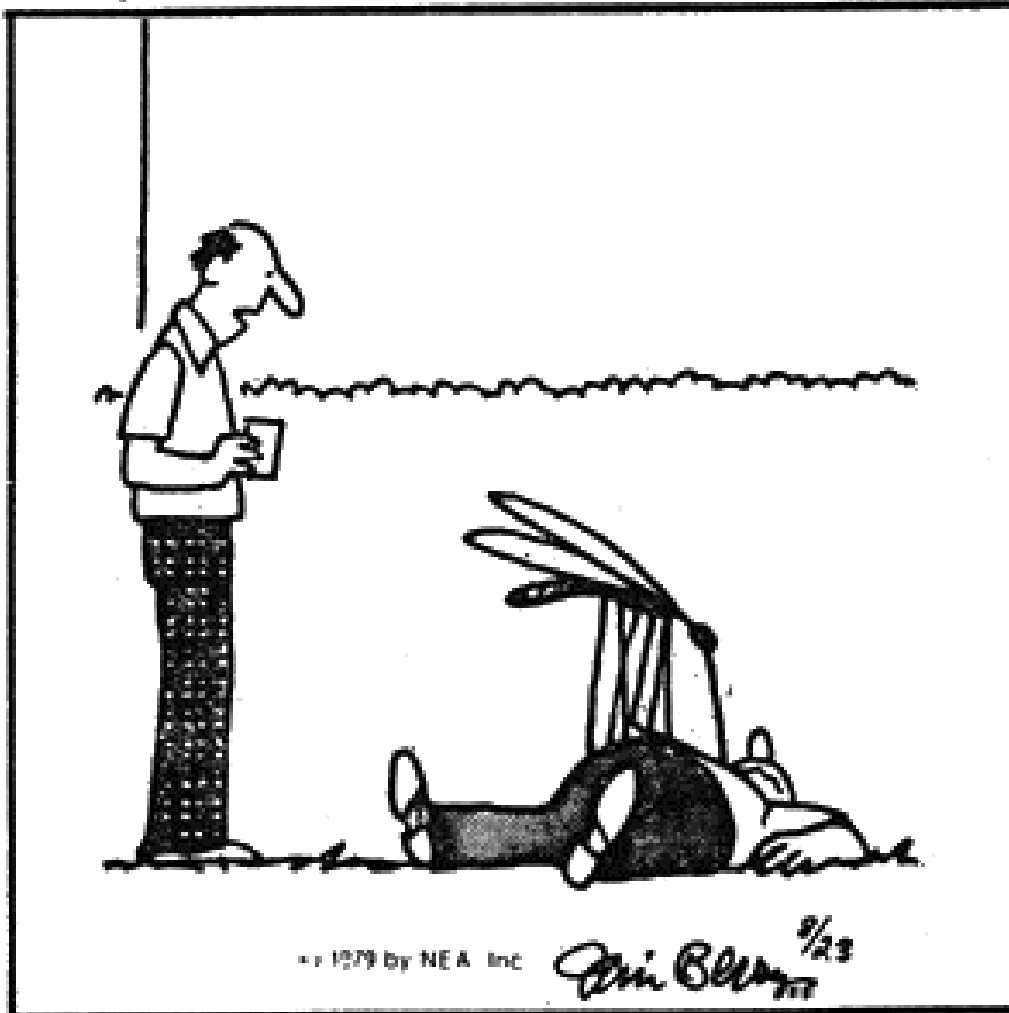
## Fish and Wildlife Service

[www.fws.gov](http://www.fws.gov)

[www.Refuges.fws.gov](http://www.Refuges.fws.gov)

[www.Realty.fws.gov](http://www.Realty.fws.gov)

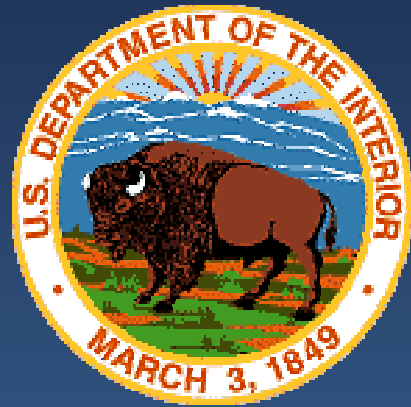
Berry's World



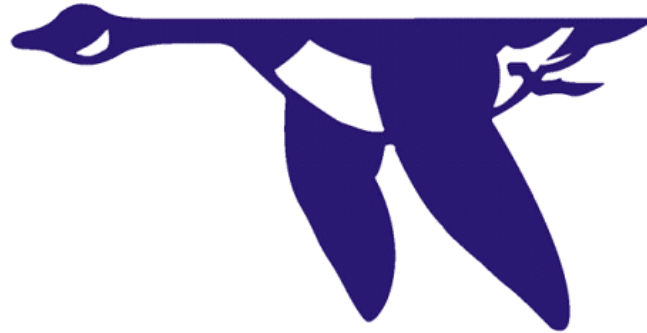
© 1979 by NEA, Inc.

*Eric Berry* 9/23

"I think the mosquitoes are worse this year than I've ever seen them."



**NATIONAL  
WILDLIFE  
REFUGE**



**BOUNDARY**

**UNAUTHORIZED ENTRY  
PROHIBITED**

U.S. DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE