

John Heinz National Wildlife Refuge at Tinicum

Overview and Summary of Management Goals

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Discussion Overview

- **Refuge Purpose**
- **Related Regional and Refuge History**
- **Refuge Biological and Visitor Services Overview**
- **Proposed Refuge Goals**



Refuge Purposes

- **Protect, manage, and restore the natural area known as Tinicum Marsh**
- **Create an environmental education center for the purpose of providing environmental education**
- **Development, advancement, management, conservation, and protection of fish and wildlife resources**



Regional Refuge History

■ 10,000 BCE

- Alluvial deposition along Delaware River created landforms and soils of present day refuge location (PNHP 2008).
- 10-20 square miles of freshwater tidal marsh believed to have existed in southeastern PA (PNHP 2008).
- Initial human settlement of Delaware Estuary (DELEP 1996).

■ 1,000 BCE

- First indications of habitat manipulation (through burning) for game management in Delaware Estuary (Berger et. al. 1994).



Regional Refuge History

■ 1600's

- 1609 – Henry Hudson's "founding" of the Delaware River.
- Dikes around Tinicum are believed to have been built as early as the 1640's to isolate marsh areas from the tidal flows of the Delaware River in order to utilize the rich silt soil for agriculture.
- 1643 - Colonel John Printz established a settlement at Tinicum that served as the seat of the Swedish government in North America for 12 years until it was surrendered to the Dutch (Stevens 1964).
- 1682 – William Penn's first visit to Pennsylvania.

1600's CE
European settlement

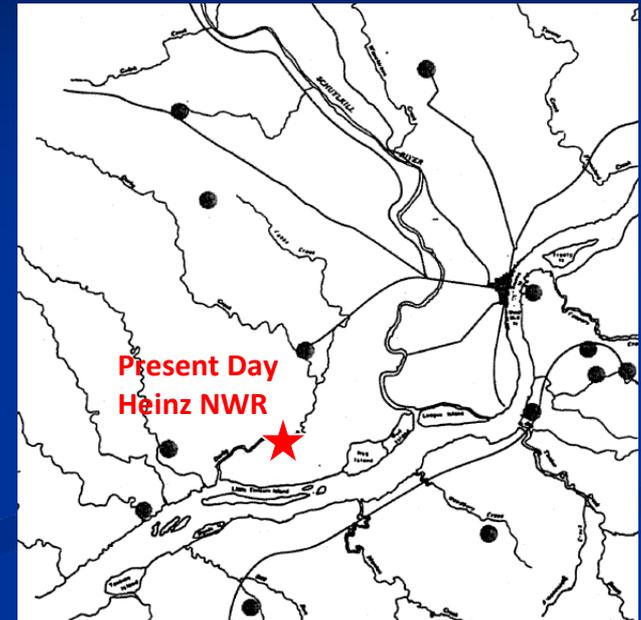
2010 CE



Regional Refuge History

■ 1700's

- Establishment of Philadelphia as a major city and trade hub of European settlements. Estimated regional population of 20,000.



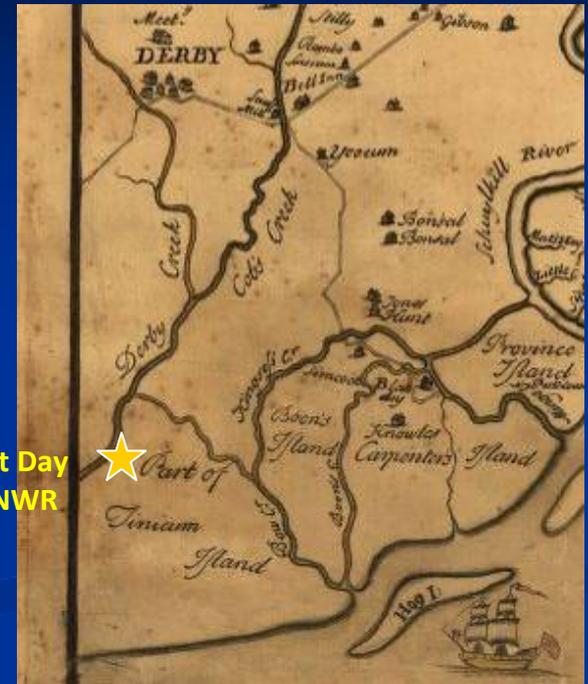
Map: Known settlements around Heinz Refuge in 1700 (from Oberman 1976).



Regional Refuge History

■ 1700's

- 1777 - British soldiers breached dikes and floodwalls near Essington.
- By 1788 - Pennsylvania legislature had passed four acts for the maintenance and expansion of dikes in and around Tinicum. Maintenance outlined includes “mow and keep them clean” and to “cut three times a year”, species such as elderberries, pokeweed, thistles, burdock... (McCormick et. al. 1970).



Present Day
Heinz NWR

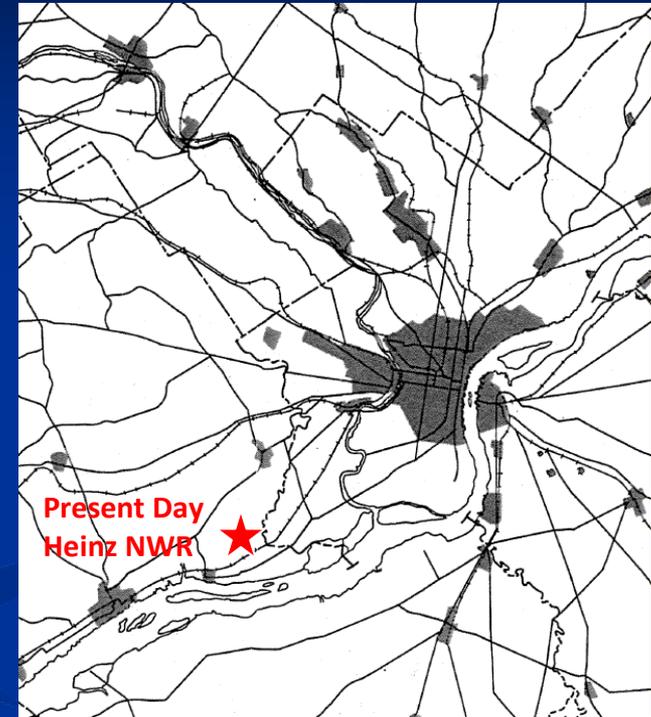
Map: Waterways and settlements around Heinz Refuge in 1757 (Scull 1757).



Regional Refuge History

■ 1800's

- Continued maintenance of dike system around area.
- Continued development and expansion of Philadelphia region. City of Philadelphia population reaches over 500,000 by mid-century.
- Development of road and railroads on and around present-day refuge lands (Oberman 1976).



Map: Development and transportation around Heinz Refuge in 1860 (from Oberman 1976).



Regional Refuge History

■ 1900's

- 1901 - Construction of the Philadelphia/Chester Rail Company trolley line (Schieck and Cox 1970). Remnants of line still exist on refuge today.
- 1930's - Darby Creek dike repairs
- 1935 – Corps mosquito ditching of Tinicum Marsh
- 1930-1950 – Corps fill disposal in portions of Tinicum Marsh (McCormick et. al. 1970).



Map: 1930 Topographic Map.



Regional Refuge History

■ 1900's

- 1950-1973 – Operation of Folcroft Landfill
- 1955 - Gulf Oil Corp. donates 200 acres (present day impoundment and surrounding lands) “to be administered for the benefit of wildlife and people.” (USFWS 2006).
- Early 1970's – Construction of I-95 and SR 420 Interchange (McCormick et. al. 1970).
- 1969 - Local residents begin grassroots effort to protect Tinicum marsh
- 1972 - Establishment of the Tinicum National Environmental Center and Refuge (McKeown 2001).



Refuge Management

Through the Years...

- **1970's – 1980's** **Preserve and protect**
- **1980's** **Wildlife management**
- **1990's** **Wildlife management and
environmental education**
- **2000's** **Transition towards ecological
management (BIDEH policy) and
expansion of environmental
education/interpretation**
- **2010 and onward** **Formalize ecological/BIDEH
focused management**

*BIDEH – Biological Diversity, Integrity, and Environmental Health



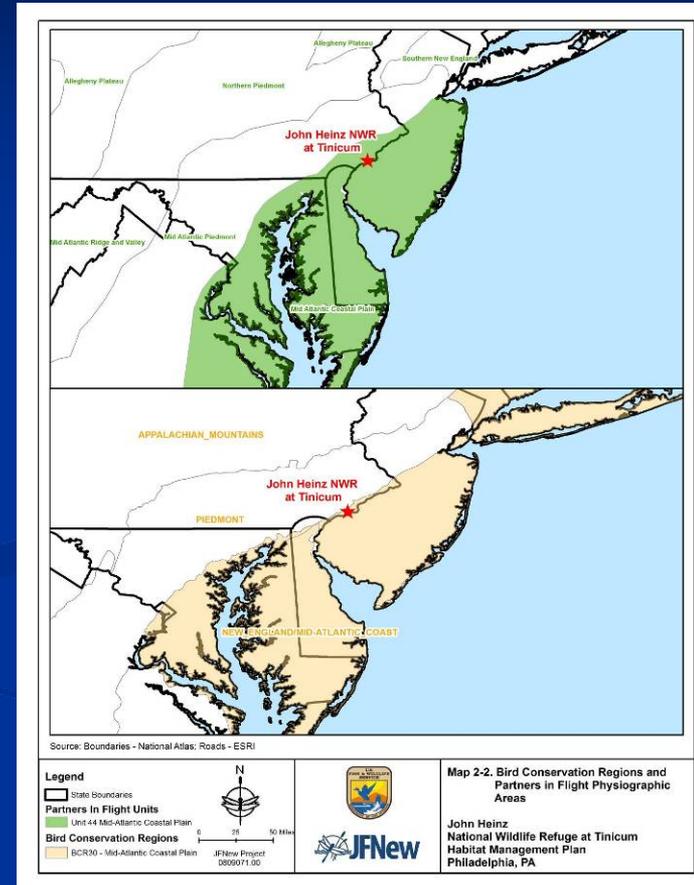


Biological Management Overview



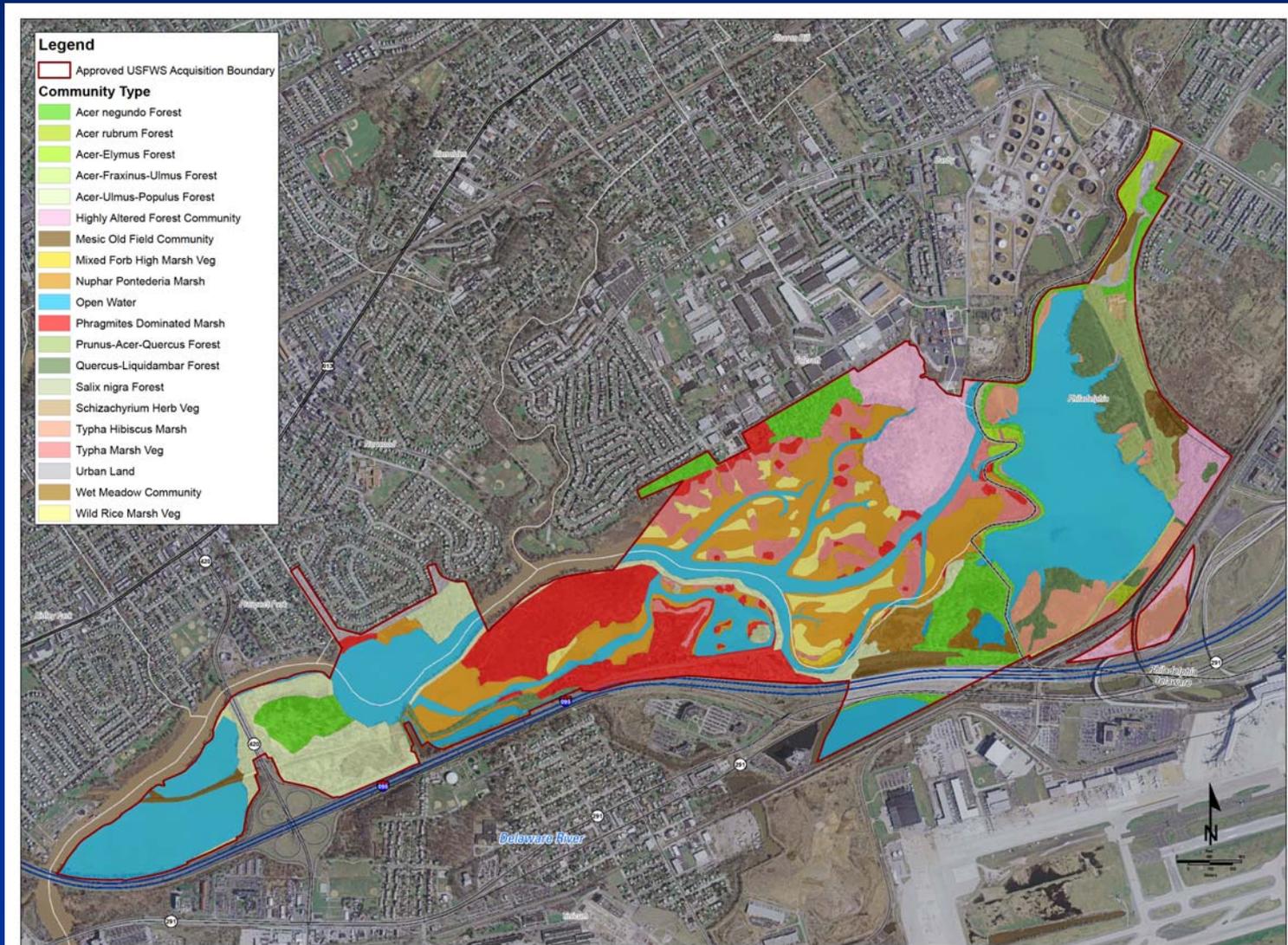
Landscape Context

- **Atlantic Flyway Stopover**
 - Important stopover along Delaware River corridor
- **Edge of Coastal Plain**
 - Edge of species ranges from both the Piedmont (north) and Coastal Plain (south)
- **Philadelphia – 4th Largest Metro Area in US**
 - Impacts of urbanization and fragmentation
- **Confluence of Darby Creek and Delaware River**
 - Water Quality Impacts
 - Freshwater Tidal Zone
 - Biological Connections
- **Delaware Bay Estuary**



Habitats

■ Habitats Comprised of 20 NVCS Associations or Alliances



Habitat Types	Acres	%
Tidal Marsh	279	28
Impoundment and Non-Tidal Open Water	202	20
Darby Creek	128	13
Coastal Plain/Floodplain Forest	325	33
Wet Meadows/ Grasslands	59	6
Total	993	100

- John Heinz NWR has an approved acquisition boundary of 1,200-acres, of which, it currently owns 993-acres outright.



Habitats

- **Freshwater Tidal Marsh (279 Ac – 28% of refuge area)**



- **Original Purpose of Refuge**
- **Largest Intact Remnant of Freshwater Tidal Marsh in PA**
- **Important breeding/foraging bird, fish, reptile, and amphibian habitat**



Habitats

■ Coastal Plain and Floodplain Forest (325 Ac – 33% of refuge area)



- Important breeding/foraging bird and amphibian habitat
- Components contain rare (G3/S2) *Quercus-Liquidambar* forest associations
- Major impacts by deer and invasive species.



Habitats

- Darby Creek (128 Ac – 13% of refuge area)
- Open Water (202 Ac – 20% of refuge area)



- Darby Creek
 - 74 square mile watershed
- 145-acre Impoundment
 - Seasonal drawdown management to support migrations

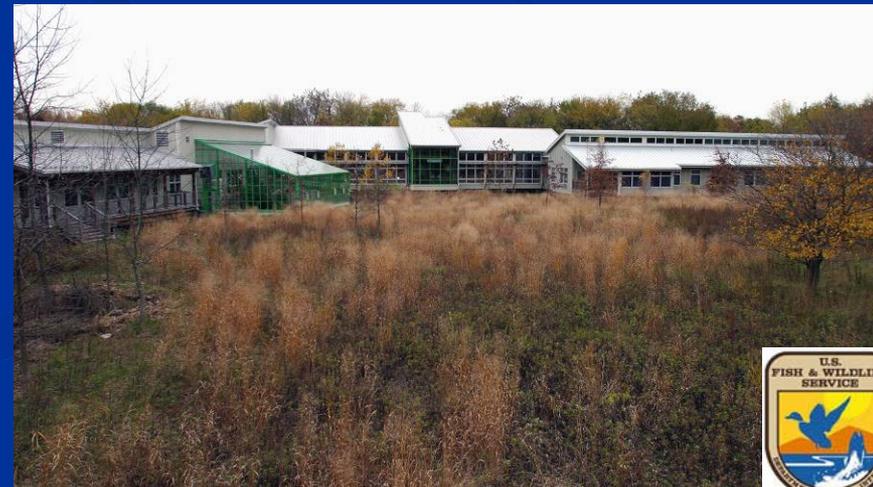


Habitats

- **Wet Meadows and Grasslands (59 Ac – 6% of refuge area)**



- **100-acres of grasslands**
 - Warm season grasslands
 - Mesic old fields
 - Wetland meadows
- **Most grassland areas do not provide significant habitat**
- **Some grasslands maintained due to existing ROWs.**





Visitor Services Management Overview



Visitor Services Context

- **Philadelphia – 4th Largest Metro Area in US**
 - **5.5 million residents within 9-county Philadelphia Metro region (2006 ACS Survey, DVRPC 2008)**
 - **Over 135,000 visitors to John Heinz NWR in 2009. Most visitors are from surrounding communities as well as Bucks and Montgomery Counties.**
 - **Over 10,000 students and teachers participated in environmental education programs on refuge in 2009.**
 - **Over 18,000 participants in interpretive programs in 2009.**



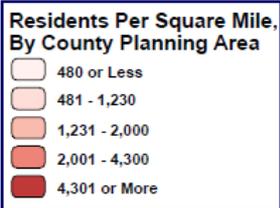
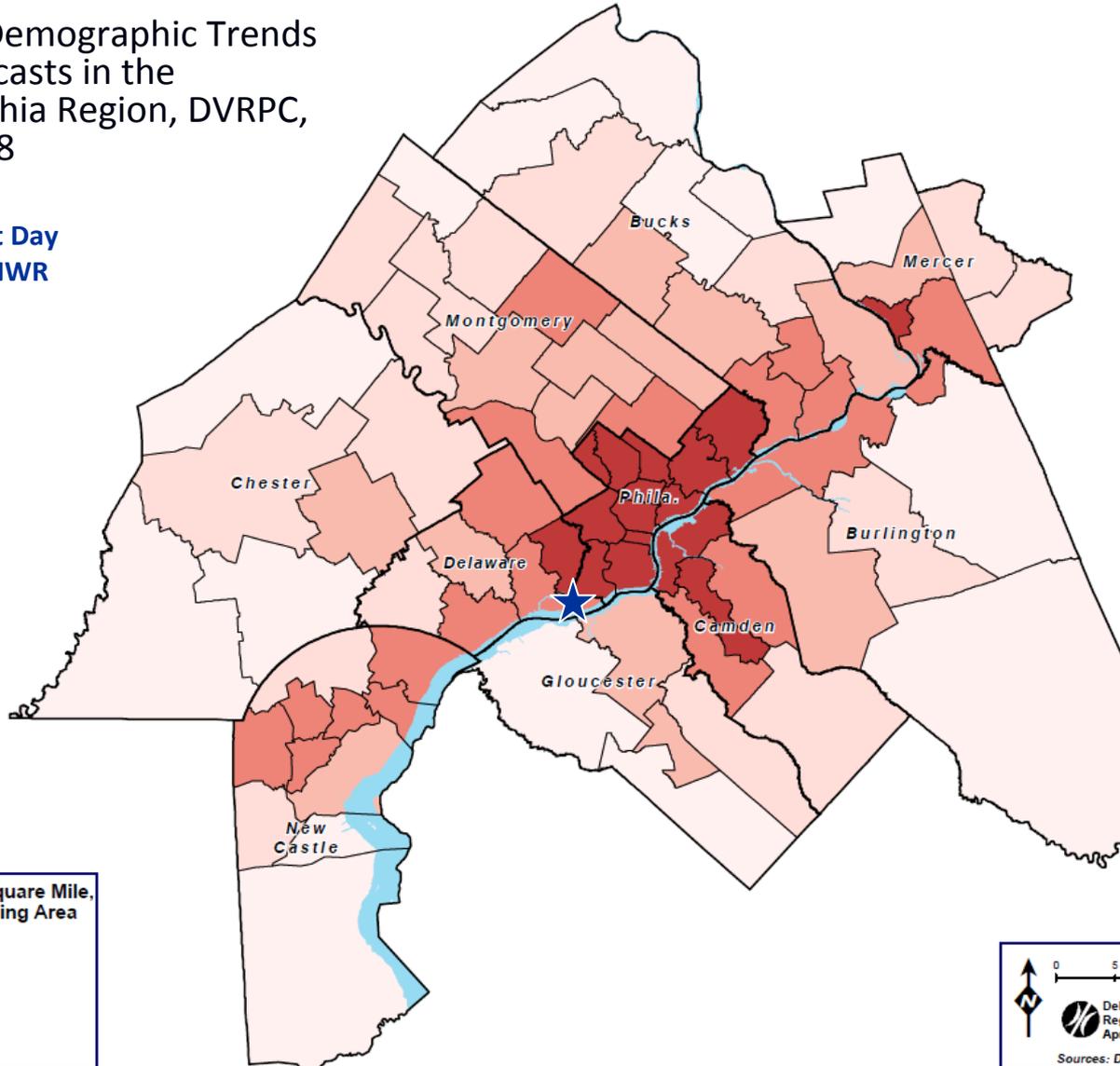
Visitor Services Context

Map 2

Residents Per Square Mile by CPA, 2000

Source: Demographic Trends and Forecasts in the Philadelphia Region, DVRPC, April 2008

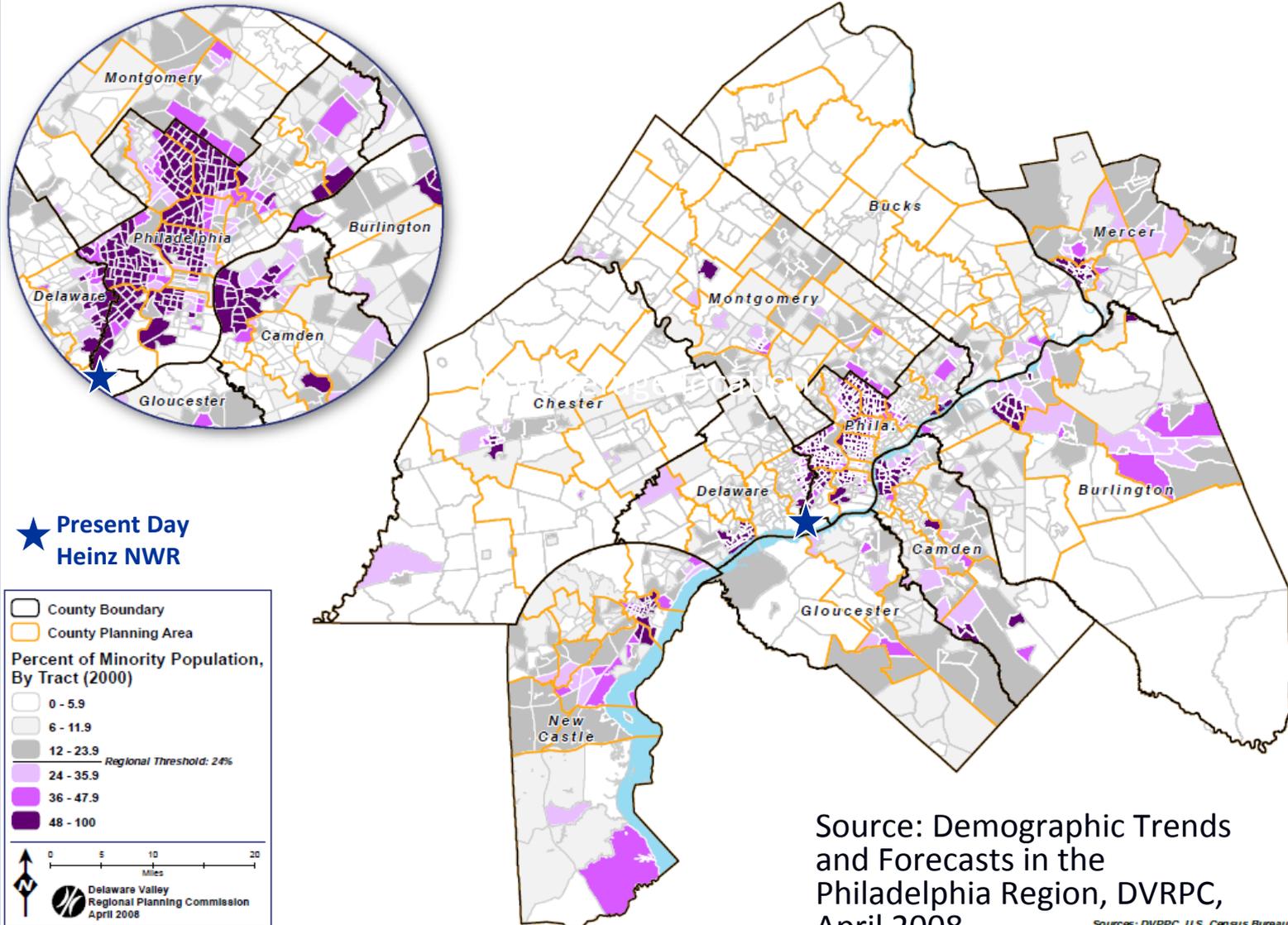
★ Present Day Heinz NWR



Visitor Services Context

Map 8

Minority Concentrations by Census Tract



Source: Demographic Trends and Forecasts in the Philadelphia Region, DVRPC, April 2008

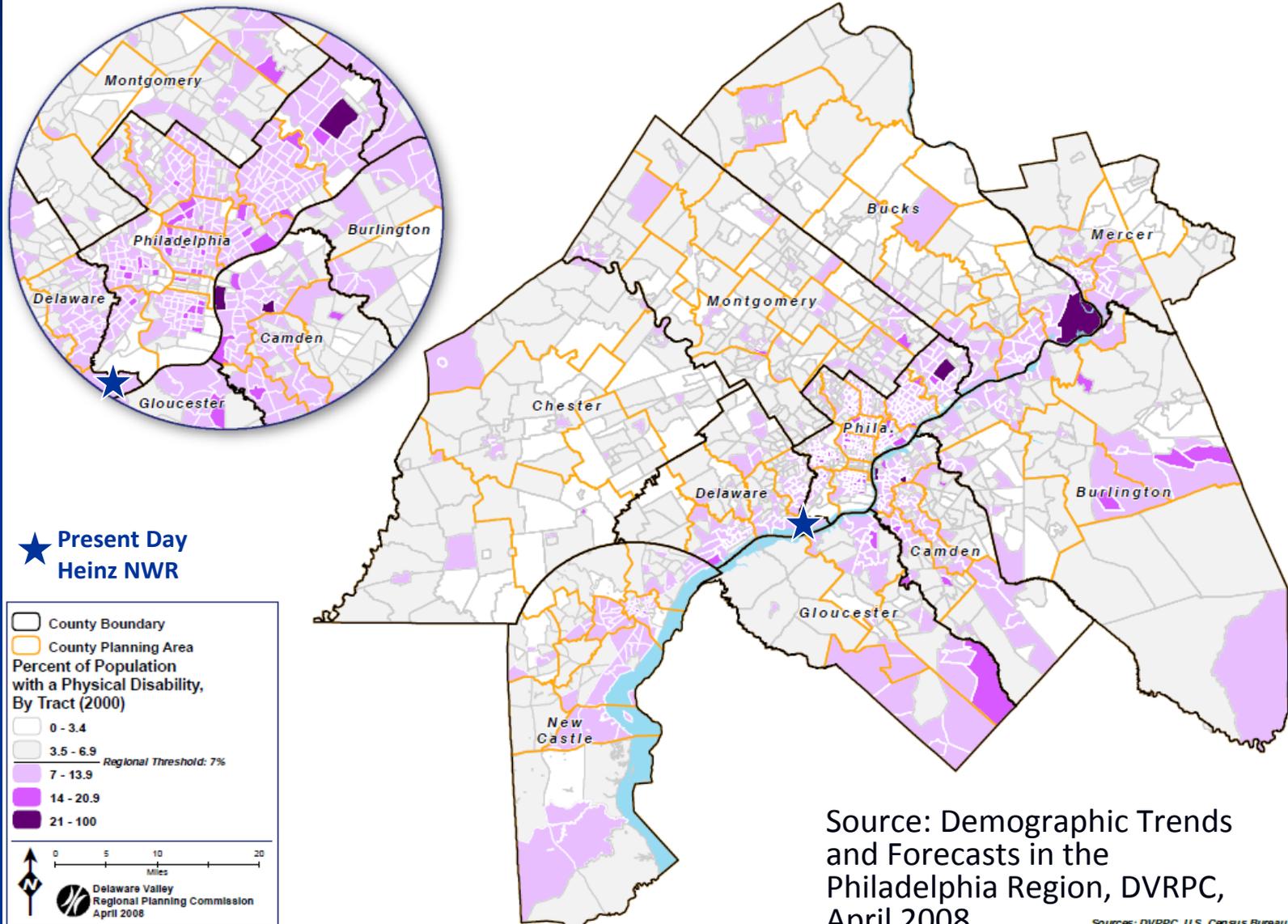
Sources: DVRPC, U.S. Census Bureau



Visitor Services Context

Map 11

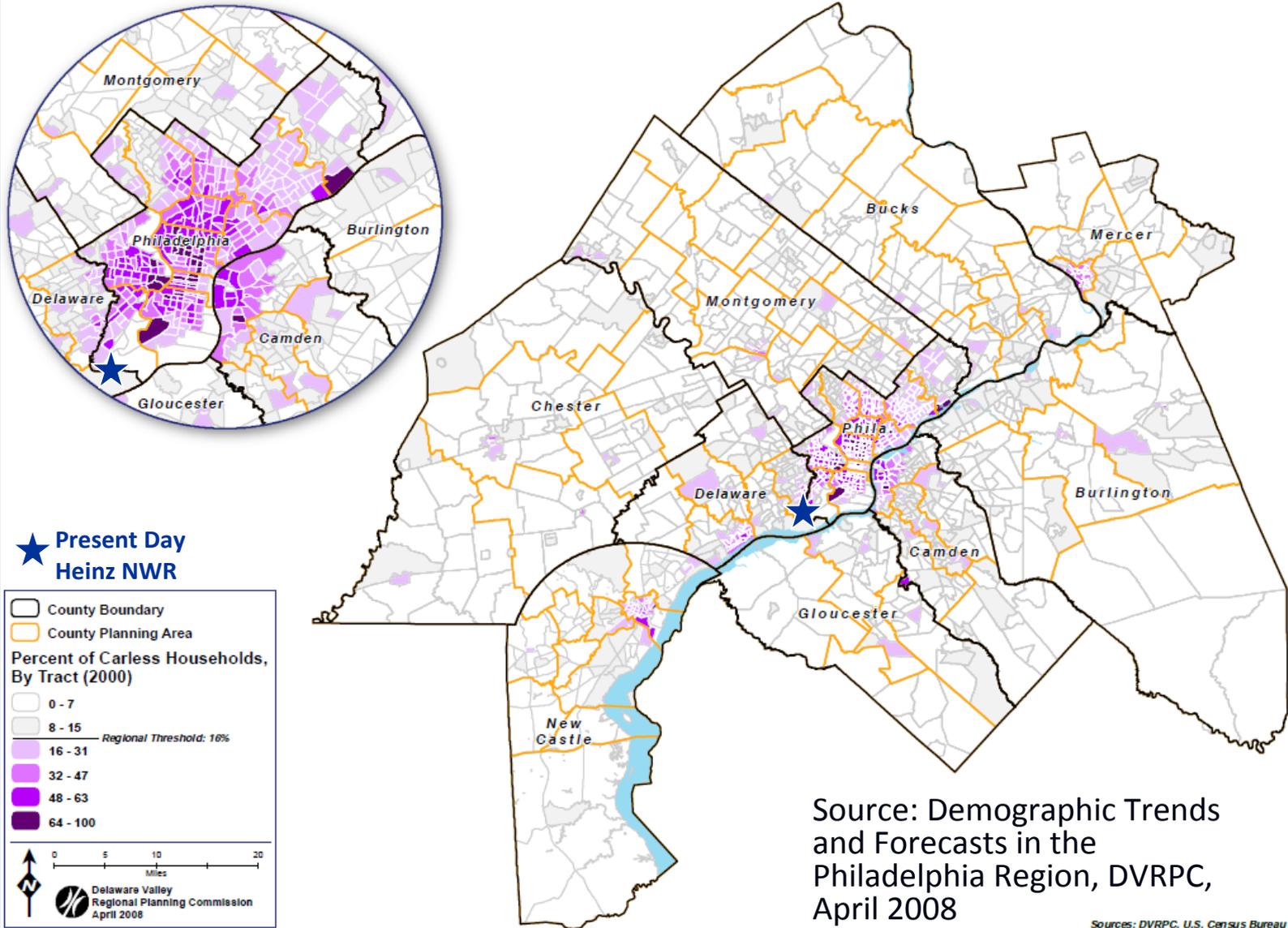
Disabled Population Concentrations by Census Tract



Visitor Services Context

Map 14

Carless Household Concentrations by Census Tract

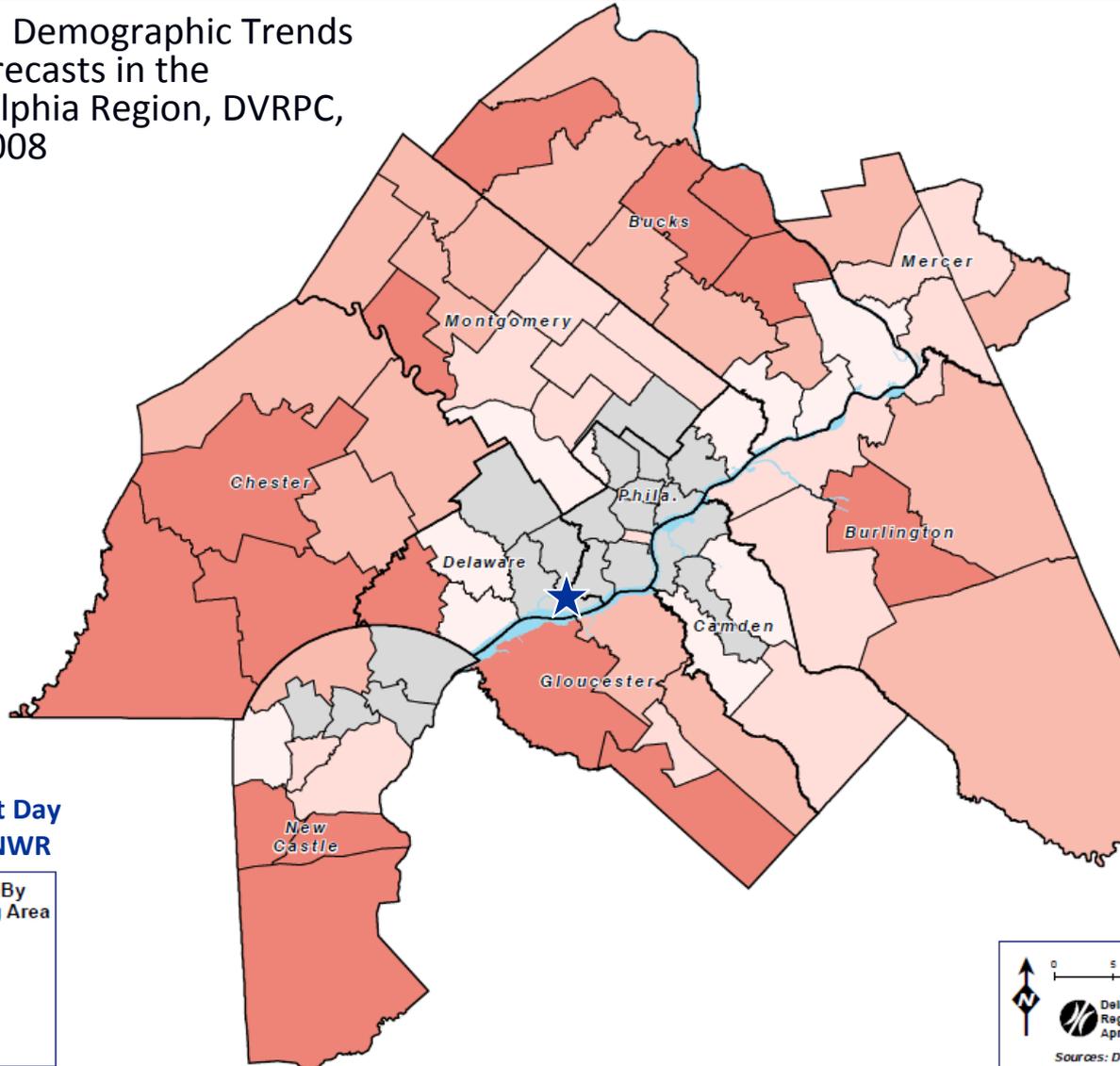


Visitor Services Context

Map 17

Forecasted Percent Population Change by CPA, 2000-2020

Source: Demographic Trends and Forecasts in the Philadelphia Region, DVRPC, April 2008



■ **Common Statewide Outdoor Activities Reported by Household** (*as identified in PA SCORP, 2008*) and a Selection of Activities Common at John Heinz NWR

Activities	Check if you participated during the past year	Check if others in your household participated during the past year
Walking	84%	58%
Wildlife Viewing	43%	33%
Dog walking	33%	26%
Birding	31%	19%
Fishing	24%	25%
Bicycling	25%	24%
Canoeing	13%	12%



- 
- **General Themes Identified by Focus Group Surveys**
(as part of PA SCORP, 2008) as related to John Heinz NWR

 - **Discussions focus largely on state and local parks, but results are of interest to John Heinz NWR**

 - **Youth (ages 6-20) Focus Responses**
 - **Transportation to recreational areas is difficult for urban youth.**

 - **Strong interest in group-based activities (hiking, walking) and development projects (trail construction)**

 - **Lack of awareness between local, state, and other parks**

 - **Safety concerns in using parks**



- **General Themes Identified by Focus Group Surveys** (*as part of PA SCORP, 2008*) as related to John Heinz NWR

- **'Boomer' (ages 48-72) Focus Responses**
 - Generally satisfied with park facilities and available activities

 - Opposed the use of trails by multiple types of users at the same time

 - Recognized they have time available to improve parks and experiences for others (including youth)

 - Lack of awareness between parks versus other publically managed lands

 - Safety concerns in using parks



Visitor Services Context

- **Emphasis of National Initiatives**
 - **USFWS Connecting People with Nature**
 - **National Environmental Education Foundations – Connecting Children and Nature**
 - **PA Clean Air Council/East Coast Greenways – Alternative Transportation and Accessibility Initiatives**



Visitor Services Management

- **Visitor Services at the Refuge is Guided By**
 - **USFWS Big 6 Priority Uses**
 - Hunting
 - Fishing
 - Wildlife Observation
 - Wildlife Photography
 - Environmental Education
 - Interpretation
 - **Regional Context and Available Uses**
 - **Recreational Demand**
 - **Refuge Capacity and Facilities**
 - **Use Appropriateness and Compatibility**



Visitor Services Management

- **Visitor Services Management To Date**
(as identified in the refuge's Visitor Service Review, 2009)

- **Two Main Emphasis Areas**

- Environmental Education
- Interpretation

- **Existing Program Priorities**

- Promote wildlife conservation and management
- Foster refuge appreciation and awareness
- Provide quality wildlife-dependent recreational opportunities



Visitor Services Management

■ Visitor Services Recommendations

(as identified in the refuge's Visitor Service Review, 2009)

■ Additional Staffing Needs

- Env. Education/Interpretation
- Volunteer Coordinator

■ Increase Guided Environmental Education Offerings

■ Opportunities to Update Environmental Interpretation Media

■ Improve Neighborhood and Urban Outreach





Management Goals



Defining Refuge Goals



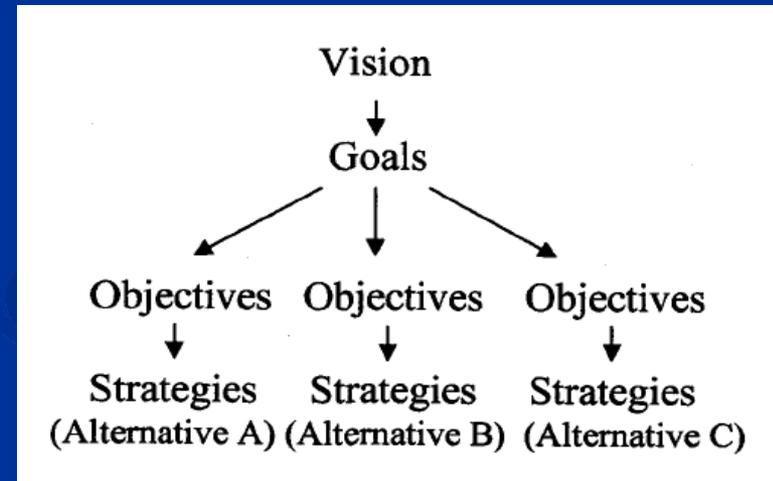
- Management planning is determined by:
 - USFWS Guiding Policies, Purposes, and Mission
 - Regional and local conservation priorities
 - Public input and compatibility

We Need Your Input Here



Defining Refuge Goals

- **Terminology (602 FW1 – Refuge Planning Policy)**
- **Goal** – Descriptive, open-ended, and often broad statement of desired future conditions that conveys a purpose but does not define measurable units.
- **Objective** – Objectives derive from goals and are the attainable, time-specific, and measurable basis for determining strategies.
- **Strategy** – Specific (or combinations of) actions, tools, and techniques used to meet unit objectives.



Biological Management

Defining Goals

- Draft HMP - Completed August 2009.
- Preliminary Goals, Objectives, and Strategies identified during development of the Draft Habitat Management Plan (HMP).
- Draft HMP involved review of national, regional, and local conservation priorities in conjunction with assessing the refuge's biological potential and management capabilities.

Species	Seasons/Abundance at John Heinz NWR ¹				Nesting ¹	Federal T&E ²	PA T&E ³	BCR 30 ⁴	PIF 44 ⁵	USFWS Birds of Conserv. Concern ⁵	Federal Trust Fish	PA SWAP Priority ⁷	North Atlantic Shorebird Plan ⁸	North American Waterbird Plan ⁹	Waterfowl Management Plan ¹⁰	USFWS Priority Fisheries ¹¹
	Spr	Sum	Fall	Win												
Waterbirds																
American Bittern	c	r	o	r	Y		PE	M	2			HC				
American Coot	c	o	c	o	Y							MC				
Black Tern	o	r	c											M		
Black-crowned Night Heron	a	a	a	o	Y		PE	M				V		M		
Bonaparte's Gull	o	r	o	r										M		
Caspian Tern	o	r	o						5					L		
Cattle Egret	o	o	r											NR		
Common Loon	o	o	o	o												
Common Moorhen	u	u	u	r	Y				5			MC				
Common Tern	r	r	r					M		X		V		L		



Table 3-2. Priority Resources of Concern and Associated Focal Species for John Heinz NWR.

Habitat	Species		Utilization By Species
Freshwater Tidal Marsh	Birds	American Bittern	B, M
		American Black Duck	B, M
		Black-bellied Plover	M
		Greater Yellowlegs	M
		King Rail	B, M
		Least Bittern	B, M
		Marsh Wren	B, M
		Sedge Wren	B, M
	Short-eared Owl	B, M	
	Reptiles	Red-bellied Turtle	B, Y
Impoundment/Open Water	Birds	Black-crowned Night Heron	B, M
		Great Egret	B, M
		Least Tern	M
		Bald Eagle	M, W
	Reptiles	Red-bellied Turtle	B, Y
Coastal Plain and Floodplain Forests	Birds	American Woodcock	B, M
		Northern Oriole	B, M
		Prothonotary Warbler	M
		Wood Thrush	B, M
	Amphibian	Coastal Plain Leopard Frog	B, Y
Darby Creek	Birds	Bald Eagle	M, W
	Fish	Alewife	B, J
		Blueback Herring	B, J
		Striped Bass	B, J, Y
		American Eel	B, J

Utilization Codes:
 B - Breeding
 M - Migratory
 W - Wintering
 Y - Year Round
 J - Juvenile or nursery habitat

Proposed Focal Species

- Focal Species identified for ROC's.
- Determined based on regional conservation priorities, known use of refuge, and ability to address needs on refuge lands.



Biological Management

Defining Goals – From Draft HMP

- **Goal 1.** Protect, maintain, and restore, where possible, the biological integrity, diversity, and environmental health of southeastern Pennsylvania coastal plain ecological communities that are unique to the Refuge and sustain native plants and wildlife, including species of conservation concern.

Addresses Freshwater Tidal Marsh, Darby Creek, Coastal Plain and Floodplain Forests

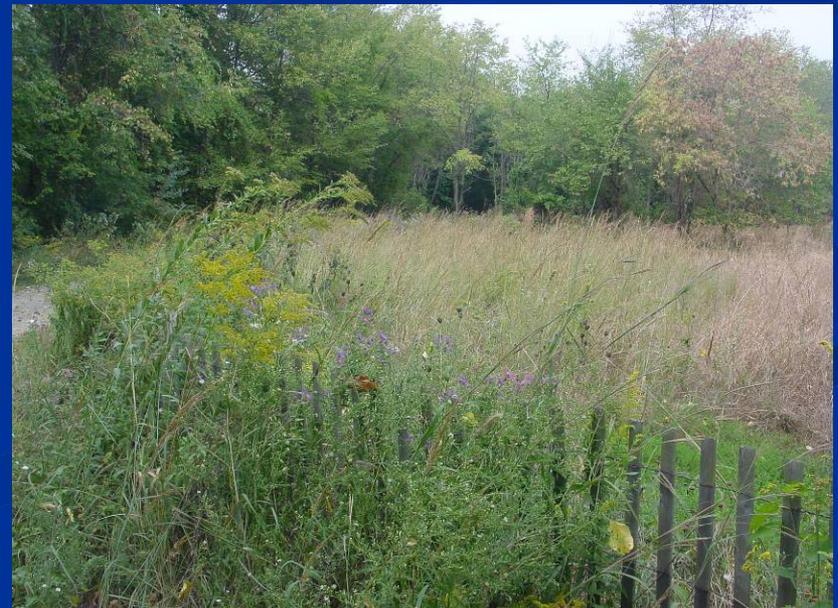


Biological Management

Defining Goals – Modified From Draft HMP

- **Goal 2.** Contribute to the enhancement of native species diversity in the Delaware Estuary, including migratory birds and other species of conservation concern, within the Refuge's managed open waters and grasslands.

Addresses 145-Acre Impoundment, Other Non-tidal Open Waters, and Grasslands



Visitor Services Management

Defining Goals

- Goals Proposed Include
 - Education
 - Interpretation
 - Wildlife-Dependent Recreation
- Similar Process to Determining Biological Goals
 - Review USFWS Policies and Refuge Purpose
 - Review Demographics and Relation to Regional Opportunities/Needs
 - Determine Refuge Capabilities and Compatibility



Visitor Services Goals

Example Goals

Environmental Education

- Provide a wide range of environmental educational opportunities, accessible to the full spectrum of the American public, that raises awareness of the National Wildlife Refuge System, inspires appreciation and stewardship of our natural and cultural resources, and expands understanding of Tinicum Marsh as a unique component of the Delaware Estuary.



Visitor Services Goals

Example Goals

Interpretation

- Visitors, students, and local residents of all ages and abilities enjoy their refuge experience, understand and appreciate the Refuge's natural and cultural resources, and value in conservation and are inspired to become better stewards in their everyday lives.



Visitor Services Goals

Example Goals

Wildlife-Dependent Recreation

- Provide quality, wildlife-dependent, outdoor recreation that allows a diversity of visitors to connect with nature.



Outreach and Partnership Goal

Example Goal

Outreach and Partnerships

- Communicate and collaborate with local communities, Federal and State agencies, Tribal governments, academic institutions, and conservation organizations throughout the Delaware Estuary to promote natural and cultural resource conservation and the mission of the National Wildlife Refuge System.



Where We Go From Here

■ Today

- Presentation Questions
- Group Questions (see agenda and handouts)
- Prioritization of Identified Issues

■ In Near Future

- Presentations will be available on the USFWS Northeast Region planning and John Heinz CCP website:
<http://www.fws.gov/northeast/planning/John%20Heinz/ccphome.html>
- Public scoping ends June 11th, 2010

