Phragmites Management Michigan State Parks

Management Objectives

- What is it that you seek to accomplish?
- Control versus elimination
- Site potential
- Manage expectations

Planning Management Action

- Survey and mapping is critical
- Budget
- Focus on keeping high quality areas, high quality
- High quality – High importance
  - Ecological/Natural Area Value
  - Scenic Value – Viewscape Management
  - Access
  - Safety
- Take advantage of opportunity
  - Partnerships
  - Grants
  - Volunteers
- Likelihood of success - **Don't start what you can't sustain**

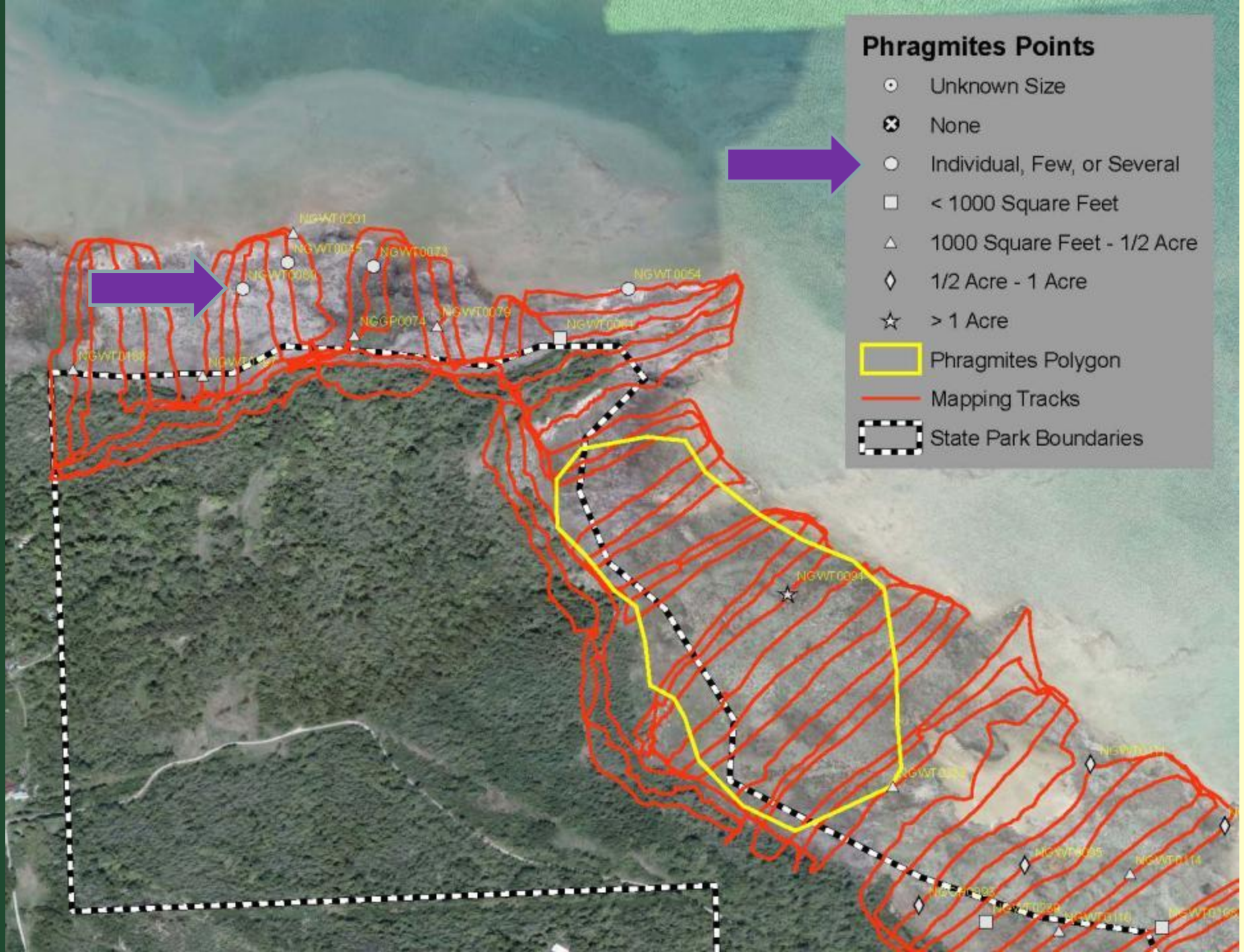
Native Versus Non-Native

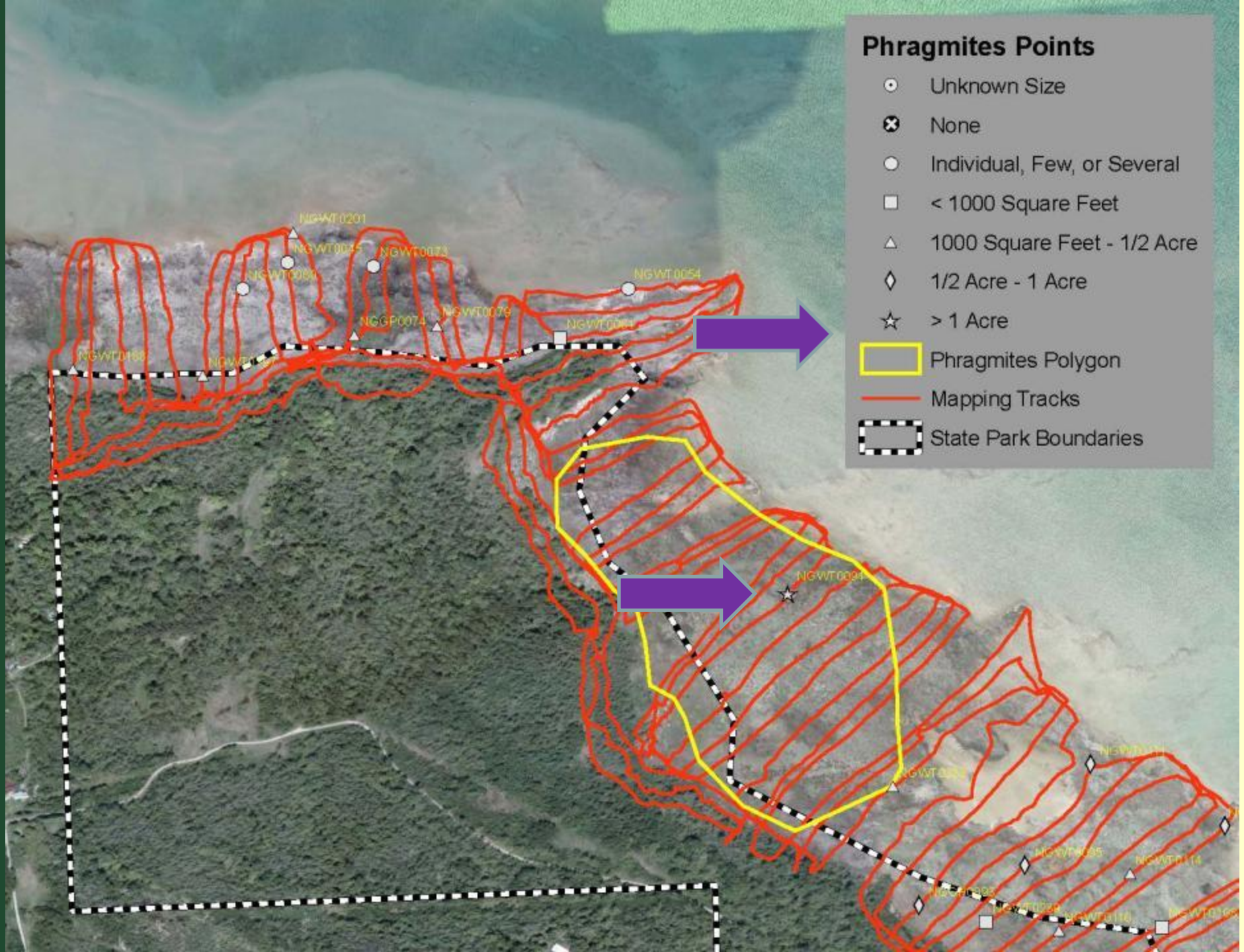
- Michigan Natural Features Inventory - Brochure
- http://mnfi.anr.msu.edu/phragmites/phragmites-native-non-native.pdf

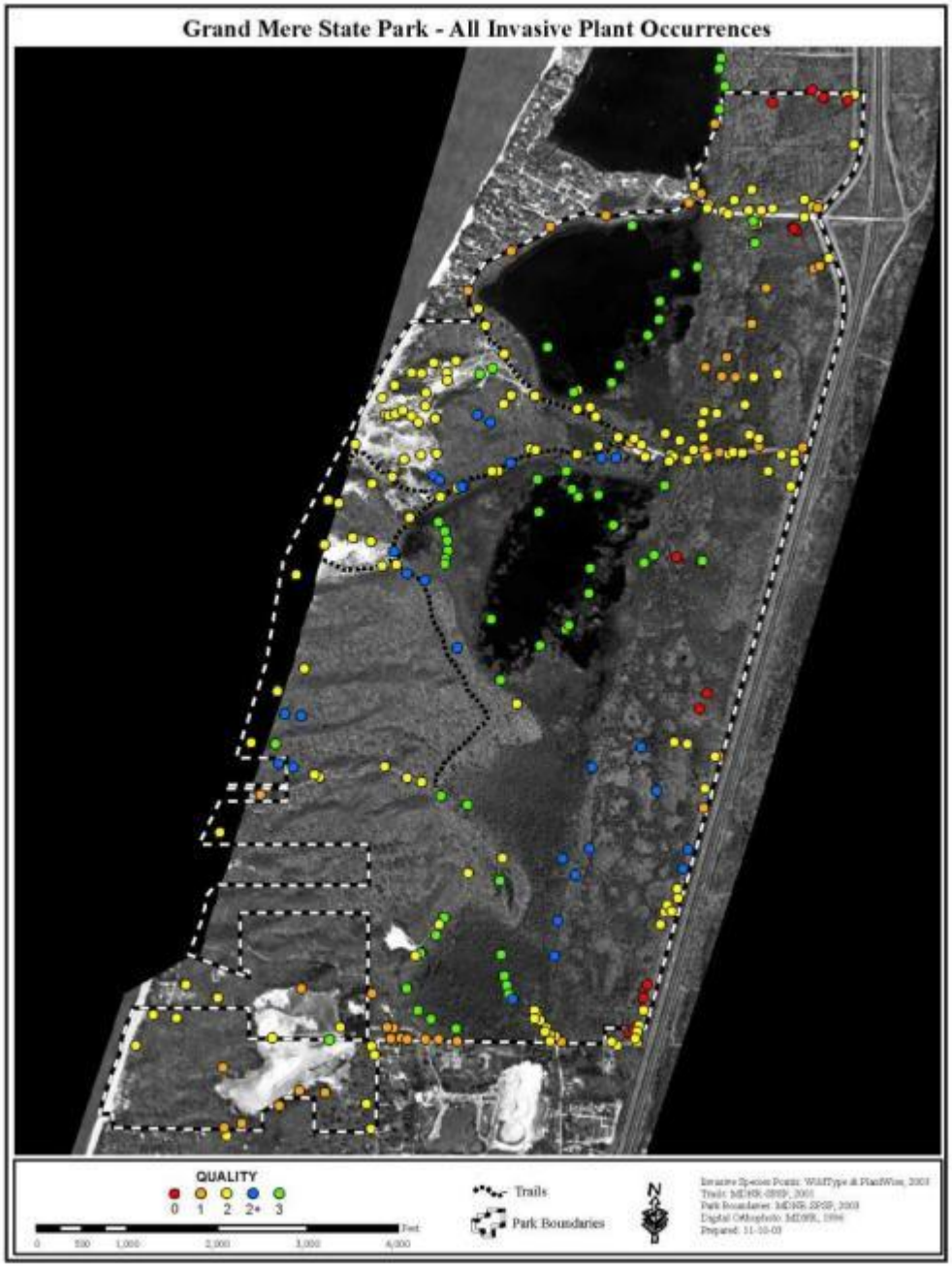
Map the Phragmites

- Document where the phragmites occurs, density, access
- Use to develop control strategies
- Use to implement treatments
- Use to document success and need for follow-up treatments

Aerial Reconnaissance


Phragmites Points
Unknown Size
None
Individual, Few, or Several
< 1000 Square Feet
1000 Square Feet - 1/2 Acre
1/2 Acre - 1 Acre
> 1 Acre
Phragmites Polygon
Mapping Tracks
State Park Boundaries
NGWT0201
NGWT0054
NGWT0074
NGWT0079
NGWT0094


Phragmites Points
Unknown Size
None
Individual, Few, or Several
< 1000 Square Feet
1000 Square Feet - 1/2 Acre
1/2 Acre - 1 Acre
> 1 Acre
Phragmites Polygon
Mapping Tracks
State Park Boundaries
NGWT0201
NGWT0054
NGWT0084


Grand Mere State Park - All Invasive Plant Occurrences
QUALITY
0 1 2 2+ 3
Trails
Park Boundaries
N

Within Site Prioritization

- Work from quality to degraded
- High value to low
- Sparse to dense
- “Early Detection Rapid Response”
  - EDRR

Survey/Mapping Specifications

- For all treatment and survey areas, thoroughly survey the entire area for the target species. In order to thoroughly survey the entire zone, it is required that surveyors systematically walk transects through the zone at a tight spacing (approximately 50-75 feet apart). The bidder's proposed survey methodology and type of GPS equipment should be described in their bid response. Alternate survey methods besides tightly-spaced transects will be considered if proposed in the bid response. Maps of known locations of the target species will be provided. However, identification/location of all populations of the target species within the defined treatment areas is the responsibility of the contractor, regardless of what is currently shown on the maps. GPS coordinates are available for known infestation point locations, but portions of the areas may not have been surveyed.
- For all treatment and survey areas, each target species population (point location) treated and each point location visited but not treated shall be recorded using the Invasive Plant Mapping protocol and form (included in the bid documents). The protocol requires recording an estimate of the size and density of each population on a form. All point locations provided by DNR must be navigated to and updated with the current population size and density (based on condition at the time of initial treatment for the season). In addition, new GPS point locations shall be mapped to the nearest 50-feet or better only for newly-discovered infestations not on the original map provided to the contractor. As stated in the protocol, populations of the target species greater than one acre shall also have a GPS track recorded around the perimeter of the population. All new points shall be labeled as specified in the protocol with the unique 2-letter code for your company provided by DNR, and no two points can have the same ID number.

Phragmites Herbicide Treatment - Chemical Permits -

May require up to two DEQ permits:

- Aquatic Nuisance Control (ANC)
  - Required when treating over standing water OR in Great Lakes bottomlands (below the ordinary high water mark)
  - Certificate of Coverage (annual): $75
  - www.michigan.gov/deq/0,1607,7-135-3313_3681_3710---,00.html
- National Pollutant Discharge Elimination System (NPDES)
  - All herbicide use in, over, or near "waters of the state" (including seasonally dry wetlands) must follow NPDES permit conditions
    - "Near" = where there's a reasonable chance chemical could drift into water or wetland
  - Written application, Certificate of Coverage, Pesticide Discharge Management Plan, etc. are required for some people
  - Certificate of Coverage (5-year): $75 app fee + $150 annual fee
  - www.michigan.gov/deq/0,4561,7-135-3313_3682_3713-241279--,00.html
- NPDES often applies even when ANC does not, because NPDES does not require standing water


DO NOT ENTER
HERBICIDE APPLIED TO VEGETATION
AREA CLOSED UNTIL
NOTICE
DO NOT REMOVE POSTING SIGN UNTIL ALL WATER USE RESTRICTIONS HAVE EXPIRED
DO NOT use this water for swimming or bathing until
DO NOT use this water for turf grass watering until
DO NOT use this water for household uses, crop irrigation, animal watering, or similar purposes until
DO NOT take fish from this treated area until

Herbicides For Phragmites Control (MDNR-PRD)

- Glyphosate (aquatic formulation)
- Imazapyr (Habitat)
- Imazamox (Clearcast)
- Surfactant (Cygnet Plus)
- Anti-drift agents
- Anti-foaming agents
- Marking dye
- All approved for use in wetlands

Herbicide Concentrations

- **Glyphosate (Accord)**
  - 1.1 % (ai) broadcast (2% by volume)
  - 5.4 % (ai) handswiping (10% by volume)
- **Imazapyr (Habitat)**
- **Glyphosate and Imazapyr** - low volume broadcast
  - 0.81 % (ai) Glyphosate (1.5 % by volume – Accord)
  - 0.43 % (ai) Imazapyr (1.5 % by volume – Habitat)
- **Imazamox (Clearcast)**
  - 0.24 % (ai) broadcast (2% by volume – Clearcast)
- **Surfactant (Cygnet Plus)**
  - 0.25% v/v (1 quart per 100 gallons of water)

Timing Phragmites Treatment

- Full seed head until hard frost
- In Southern Michigan
  - August 15 – October 10
- Effective control even after a light frost
- Glyphosate
  - only effective late summer to early fall
- Imazapyr or Clearcast
  - mid-summer to early fall

Helicopter Applications

Mobilization

Aerial Application – Costs

- Sterling SP 2009
  - 100 acres, $25,711 ($257/acre)
  - Included
    - helicopter (with mobilization)
    - herbicide – glyphosate & imazapyr
    - DNR staff time
- Sterling SP 2011
  - 195 acres, $27,883 ($143/acre)
  - Included
    - helicopter (with mobilization)
    - herbicide – glyphosate & imazapyr
    - DNR staff time
  - Cost effective at about 10 acres

Aerial: 80% -90% Reduction in Phragmites Coverage

Summer Burn

Winter Burn

Winter Burn

Day After Summer Burn

Two Weeks After Summer Burn

Native Response

Ground Applications

Broadcast Spray

Ground Applications

Broadcast Spray

Ground Applications

Backpack Broadcast and Spot Spray

Ground Applications

Hand Swipe Techniques

Hand Swipe

Dye – Documents Treatment

Phragmites Treatment Specifications

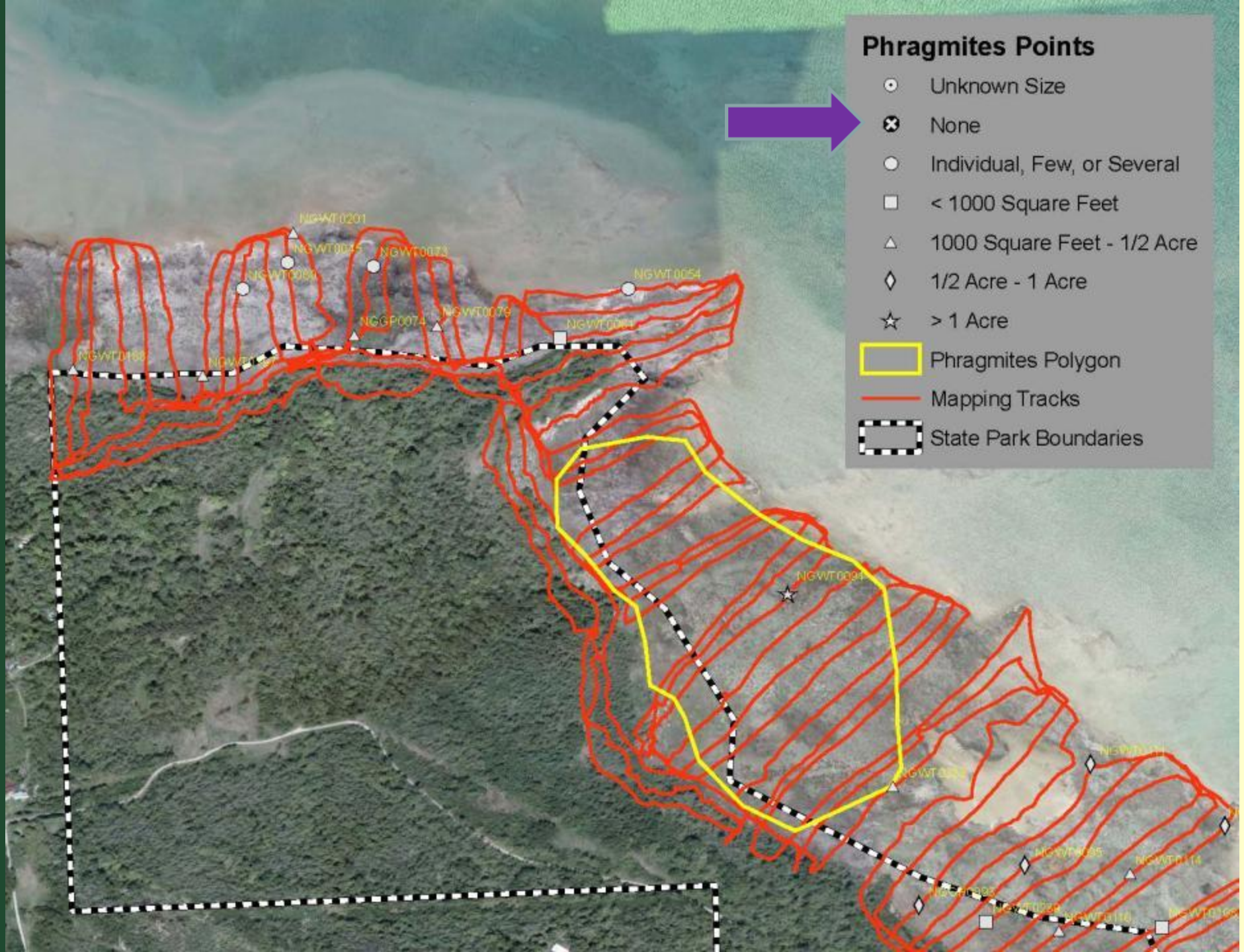
- **Phragmites**
  Apply herbicide to the foliage of all live culms of phragmites (*Phragmites australis*) within the designated treatment areas. Foliar spraying may be used in areas where significant damage to non-target native vegetation can be avoided (i.e., in dense patches composed of 75% or more phragmites or phragmites stands of any density mixed with other non-native vegetation). For isolated plants or sparse patches adjacent to native vegetation, individual plants must be treated by a careful wick or hand application of herbicide to individual plants. Seed heads must also be removed from isolated phragmites plants. “Isolated” and “sparse” will be defined at the pre-bid meeting.

  Treatment must occur after the majority of phragmites plants have tasseled (while plants are supplying nutrients to the rhizome), between August 15 and September 30, 2012 or prior to the date of the first killing frost, whichever comes first. Payment will not be made for phragmites treatment that occurs outside this window.

Monitoring

- Adaptive management
- Photo-monitoring
- Quantitative sampling
- Mapping to record change
- Tracking treatment hours
- Tracking volume of chemical used

Quantitative Monitoring


Phragmites Points
Unknown Size
None
Individual, Few, or Several
< 1000 Square Feet
1000 Square Feet - 1/2 Acre
1/2 Acre - 1 Acre
> 1 Acre
Phragmites Polygon
Mapping Tracks
State Park Boundaries
NGWT0201
NGWT0054
NGWT0074
NGWT0079
NGWT0084


August 8, 2003


November 17, 2003


March 24, 2004


August 19, 2004


August 18, 2005


August 24, 2006


September 11, 2007

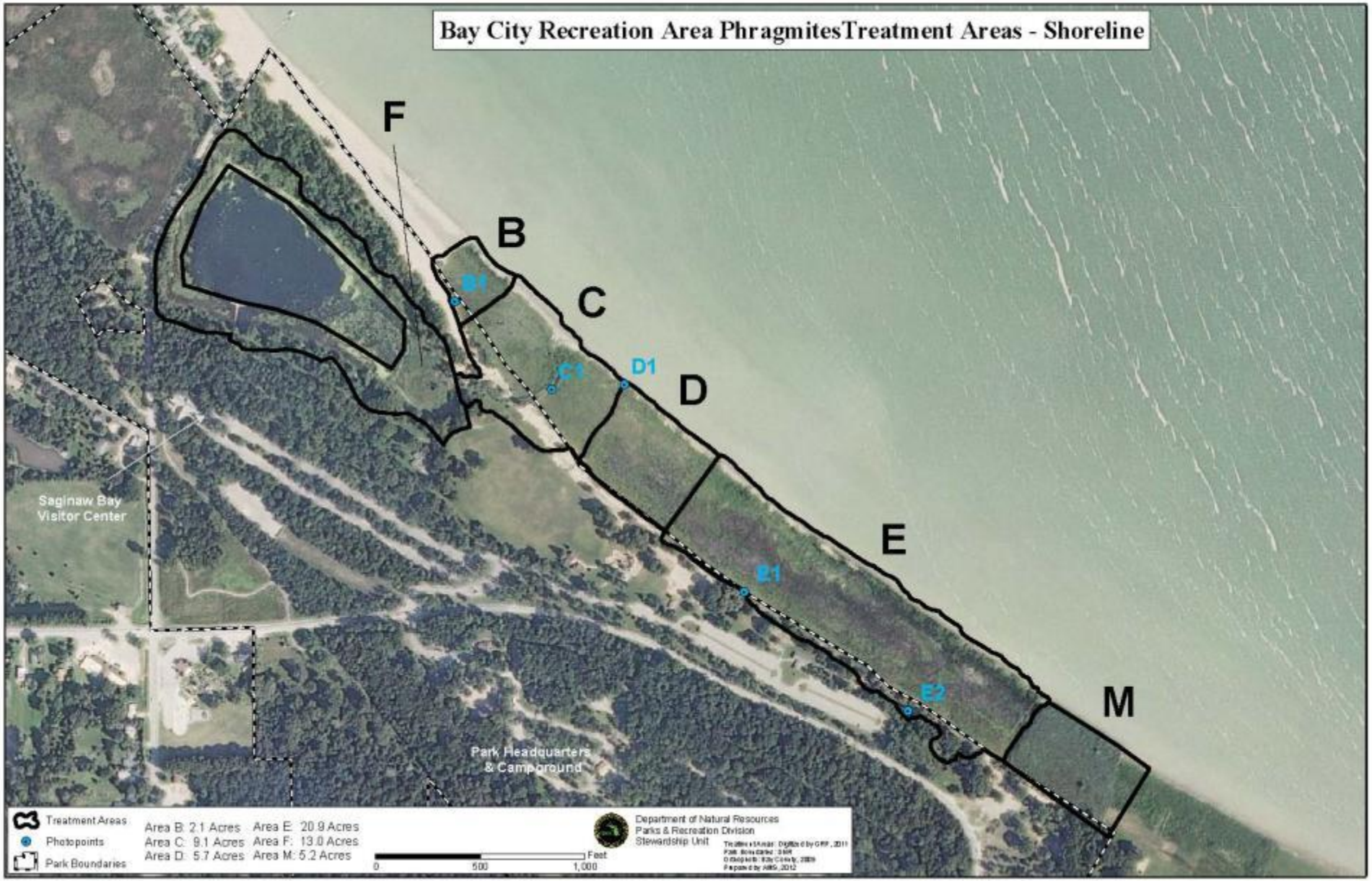

August 30, 2008

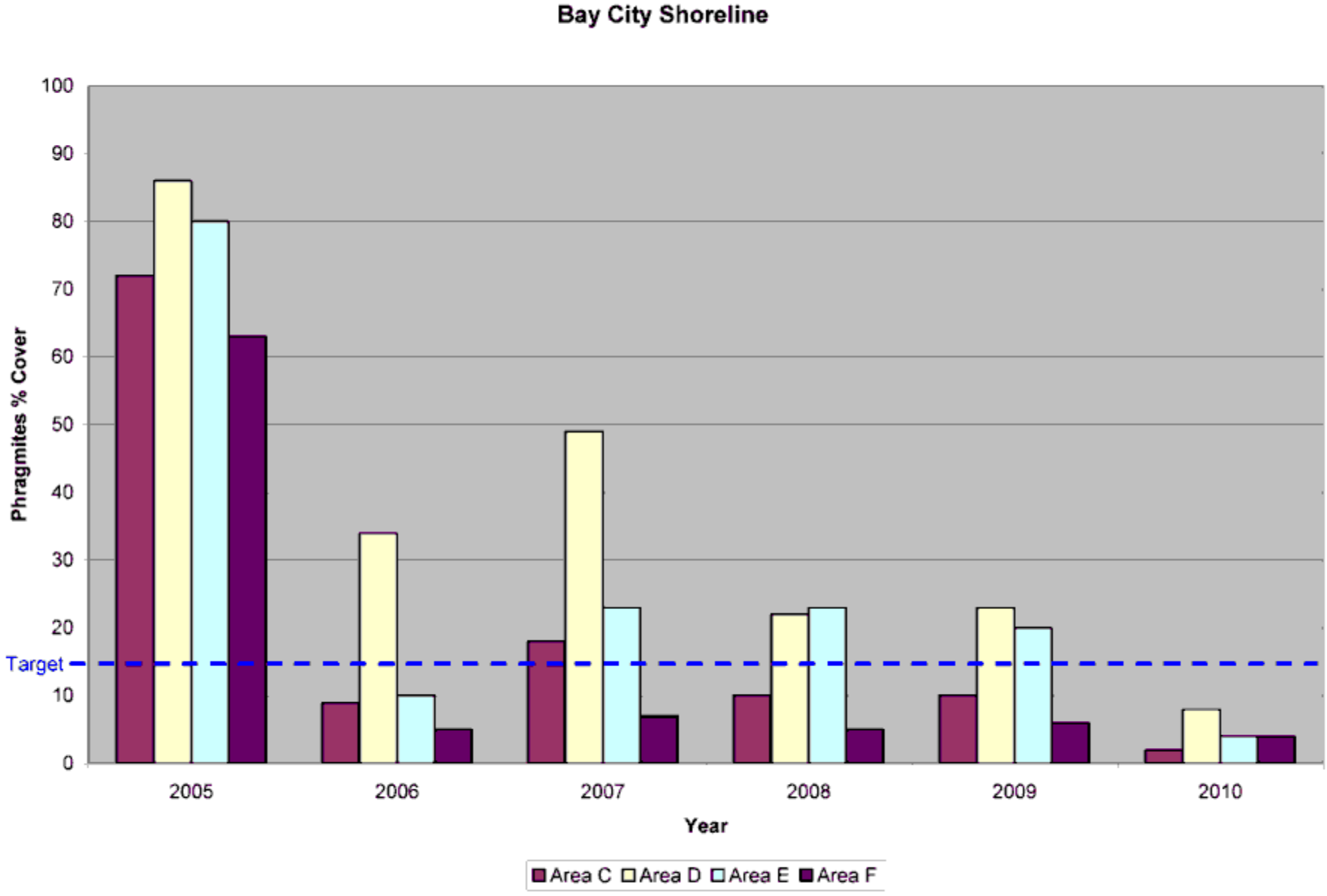

September 16, 2009

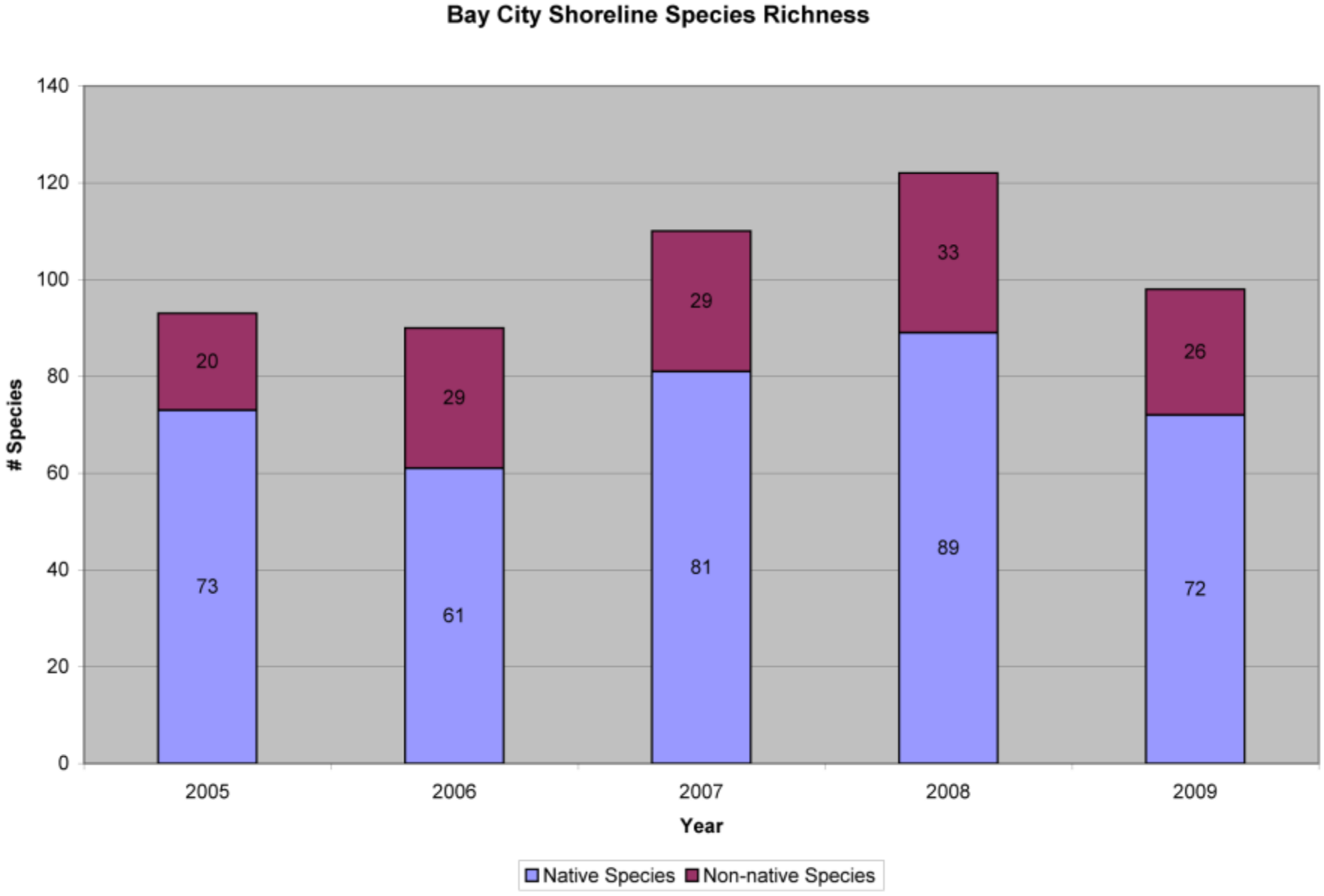

September 20, 2010

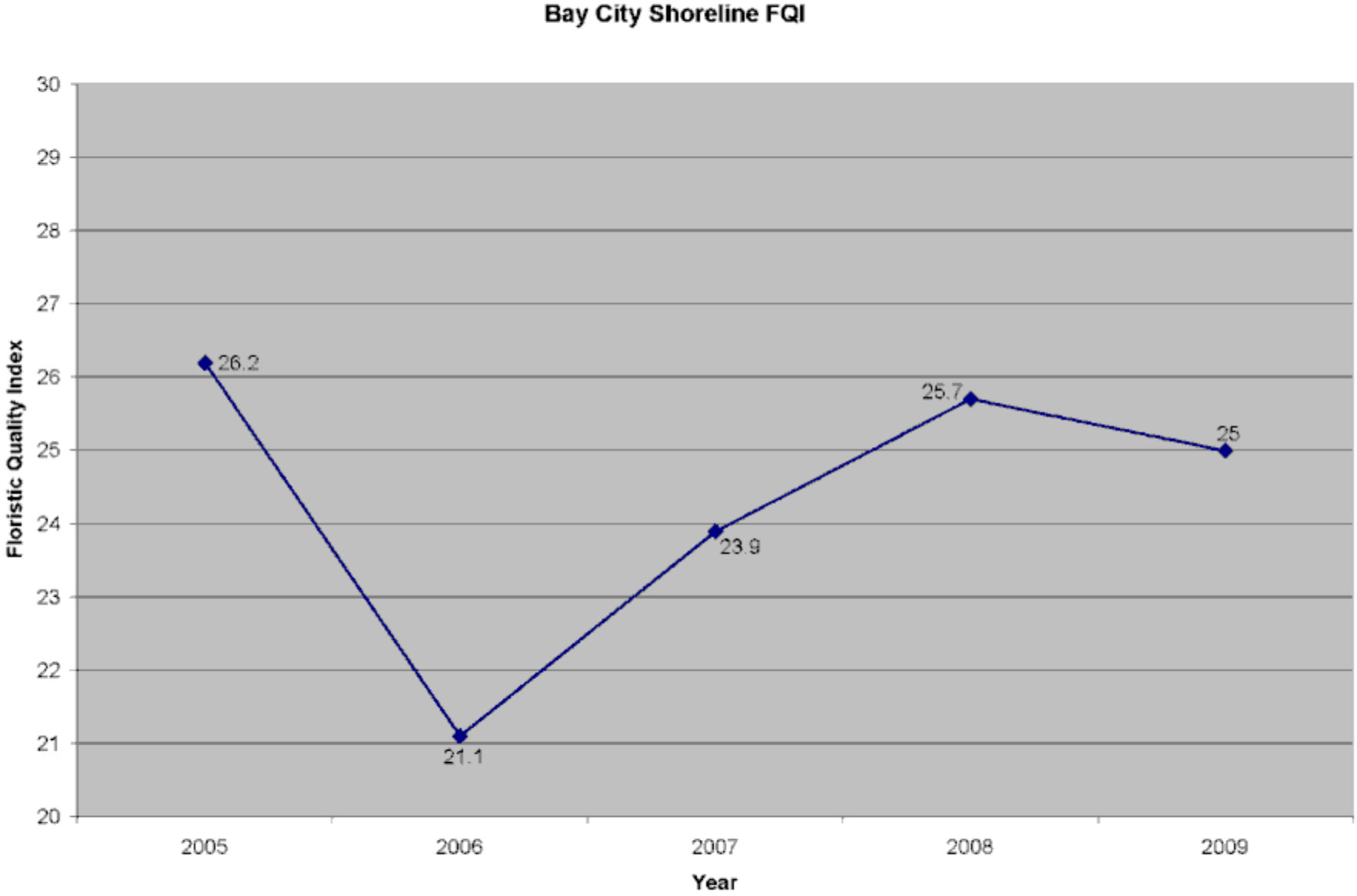

September 17, 2011


September 15, 2012

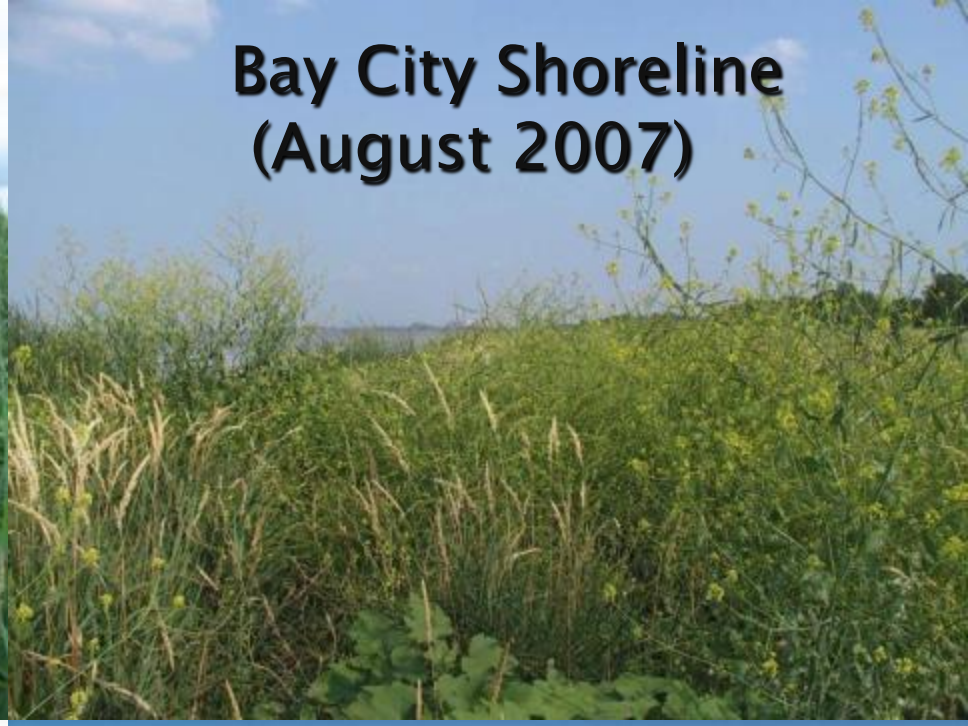

Bay City Recreation Area PhragmitesTreatment Areas - Shoreline
F
B
C
D
E
M
B1
C1
D1
E1
E2
Saginaw Bay
Visitor Center
Park Headquarters
& Campground
Treatment Areas
Photopoints
Park Boundaries
Area B: 2.1 Acres
Area C: 9.1 Acres
Area D: 5.7 Acres
Area E: 20.9 Acres
Area F: 13.0 Acres
Area M: 5.2 Acres
0
500
1,000
Feet
Department of Natural Resources
Parks & Recreation Division
Stewardship Unit

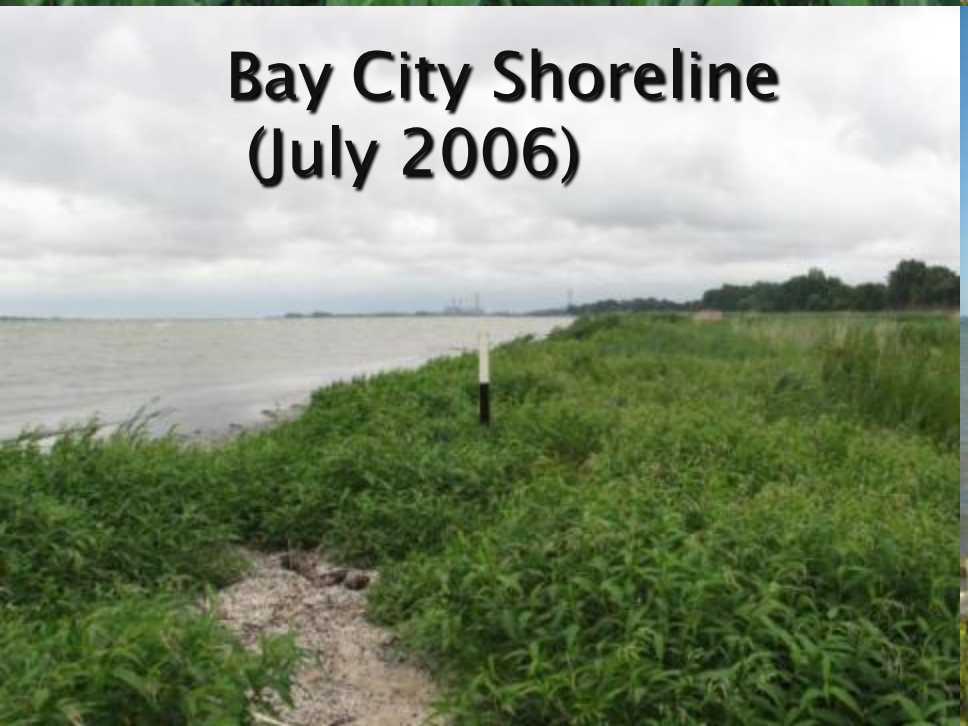

Bay City Shoreline
Phragmites % Cover
100
90
80
70
60
50
40
30
20
Target
10
0
2005
2006
2007
2008
2009
2010
Year
Area C
Area D
Area E
Area F


Bay City Shoreline Species Richness
140
120
100
80
60
40
20
0
Species
20
29
29
33
26
73
61
81
89
72
2005
2006
2007
2008
2009
Year
Native Species
Non-native Species


Bay City Shoreline FQI
Floristic Quality Index
30
29
28
27
26
25
24
23
22
21
20
26.2
21.1
23.9
25.7
25
2005
2006
2007
2008
2009
Year


Bay City Shoreline
(July 2005)


Bay City Shoreline
(August 2007)


Bay City Shoreline
(July 2006)

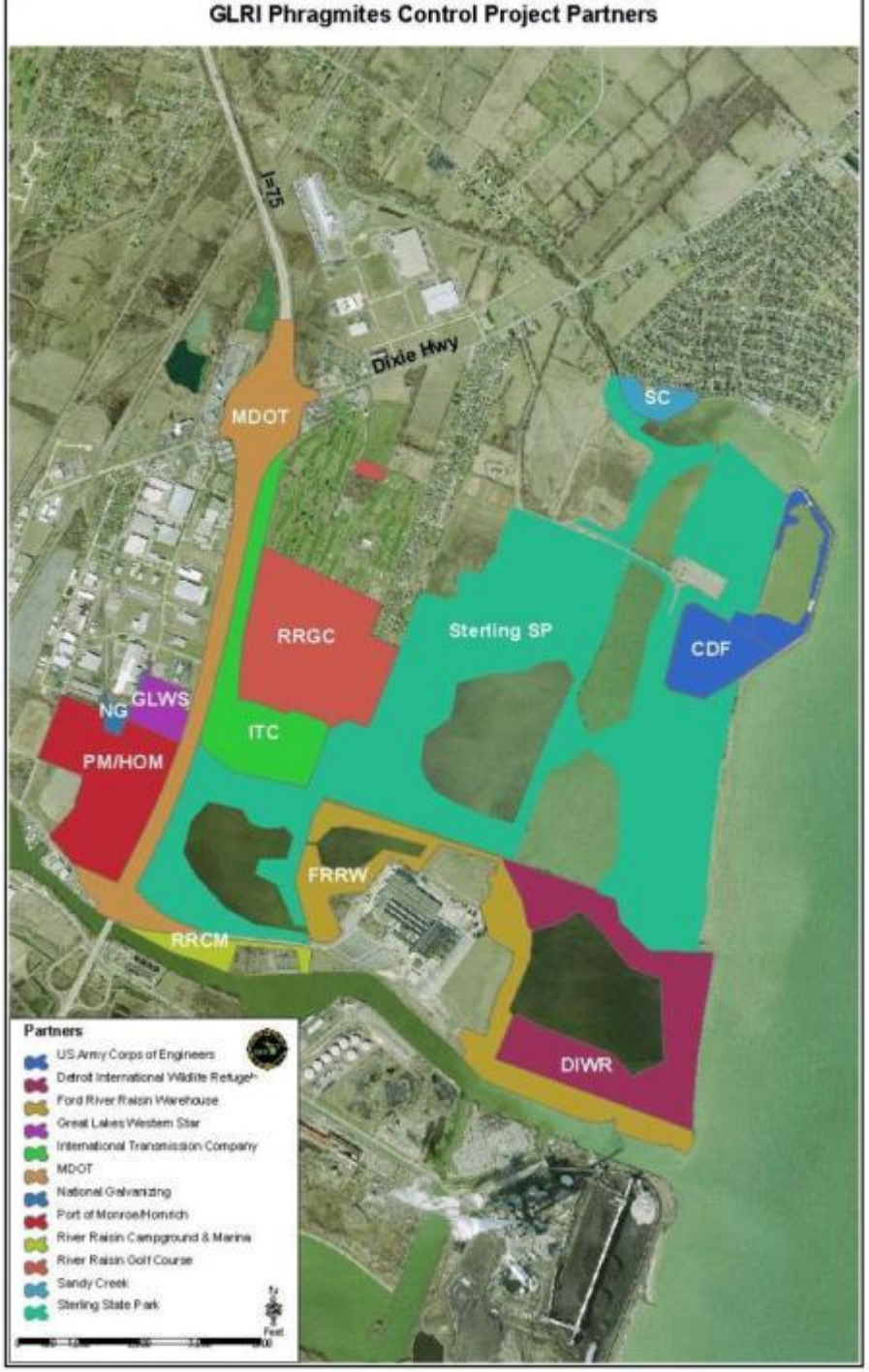

Bay City Shoreline
(August 2009)

Phragmites Treatment Costs Bay City Rec. Area

- 2005: $13,829 (zones C, D, E, F)
  - 49 acres treated by helicopter and ground-based foliar spray/hand swipe
- 2006: $20,500 **($418 ac)** (zones C, D, E, and F
  - 49 acres treated by ground-based foliar spray/hand swipe)
- 2006: $2,500 ($66/ac) (zones B, C, D, and E)
  - 38 acres burned in spring
- 2007 : $17,000 **($472/ac)** (zones C, D, E)
  - – 36 acres treated by ground-based foliar spray/hand swipe
- 2007: $1,300 ($100 ac) (zone F)
  - 13 acres burned in spring
- 2007: Unknown cost (zone F) – MCCC Crew
  - 13 acres treated by ground-based foliar spray/hand swipe

Phragmites Treatment Costs Bay City Rec. Area

- 2008: $18,000 **($367/ac)** (zones C, D, E, and F)
  - 49 acres treated by ground-based foliar spray/hand swipe
- 2009: $17,900 (zones C, D, E, F, and M=new property)
  - 54 acres treated by ground-based foliar spray/hand swipe **($331/ac)**
- 2010: $15,700 **($280/ac)** (zones B, C, D, E, F, and M)
  - 56 acres treated by ground-based foliar spray/hand swipe
- 2011: $15,500 **($276/ac)** (zones B, C, D, E, F, and M)
  - 56 acres treated by ground-based foliar spray/hand swipe
- 2012: $4,637 **($82/ac)** (zones B, C, D, E, F, and M)
  - 56 acres treated by ground-based foliar spray/hand swipe
- **2005-2012 Total cost $126,866**


GLRI Phragmites Control Project Partners
I-75
Dixie Hwy
MDOT
SC
RRGC
Sterling SP
CDF
NG
GLWS
ITC
PM/HOM
FRRW
RRCM
DIWR
Partners
US Army Corps of Engineers
Detroit International Wildlife Refuge
Ford River Raisin Warehouse
Great Lakes Western Star
International Transmission Company
MDOT
National Galvanizing
Port of Monroe/Hornich
River Raisin Campground & Marina
River Raisin Golf Course
Sandy Creek
Sterling State Park
Feet

Phragmites Partners
Wm. C. Sterling State Park

- Detroit River International Wildlife Refuge - USFWS
- Port of Monroe
- Homrich, Inc.
- Raisin River Golf Course
- ITC Holdings Corp.
- City of Monroe, Michigan
- Ford Motor Co., River Raisin Warehouse
- River Raisin Campground & Marina
- Great Lakes Western Star
- National Galvanizing
- United States Army Corps of Engineers
- Michigan Department of Transportation
- Wm. C. Sterling State Park
- Sandy Creek Wetland - Carol Garrett (Property Owner)

Questions?

fahlsingr@michigan.gov
clancyr@michigan.gov