PROJECT**clarity**

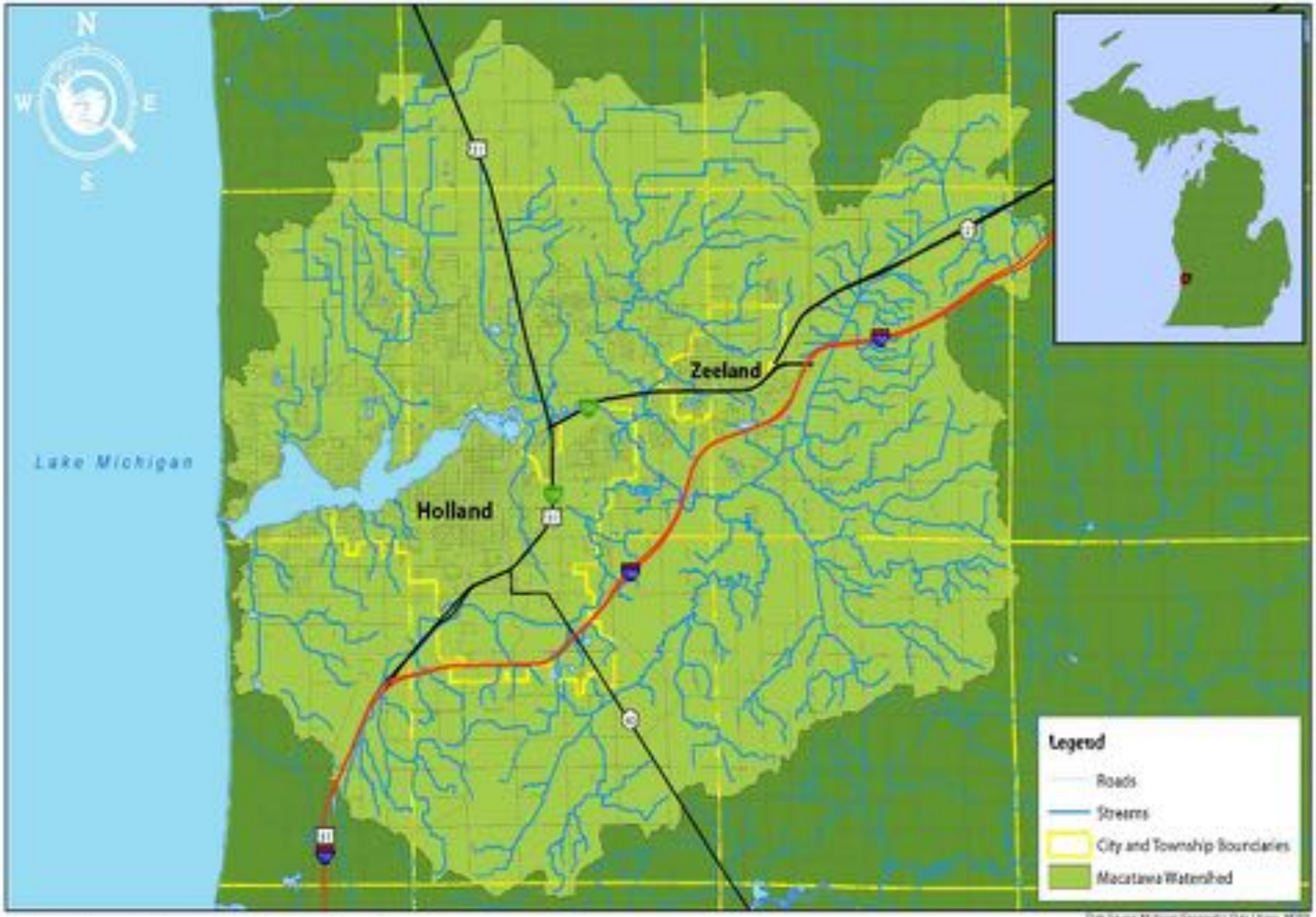
Restoring the Macatawa Watershed

Ben Heerspink
Outdoor
Discovery Center
Macatawa
Greenway

Todd Losee
Niswander
Environmental

Private/Public Investment:

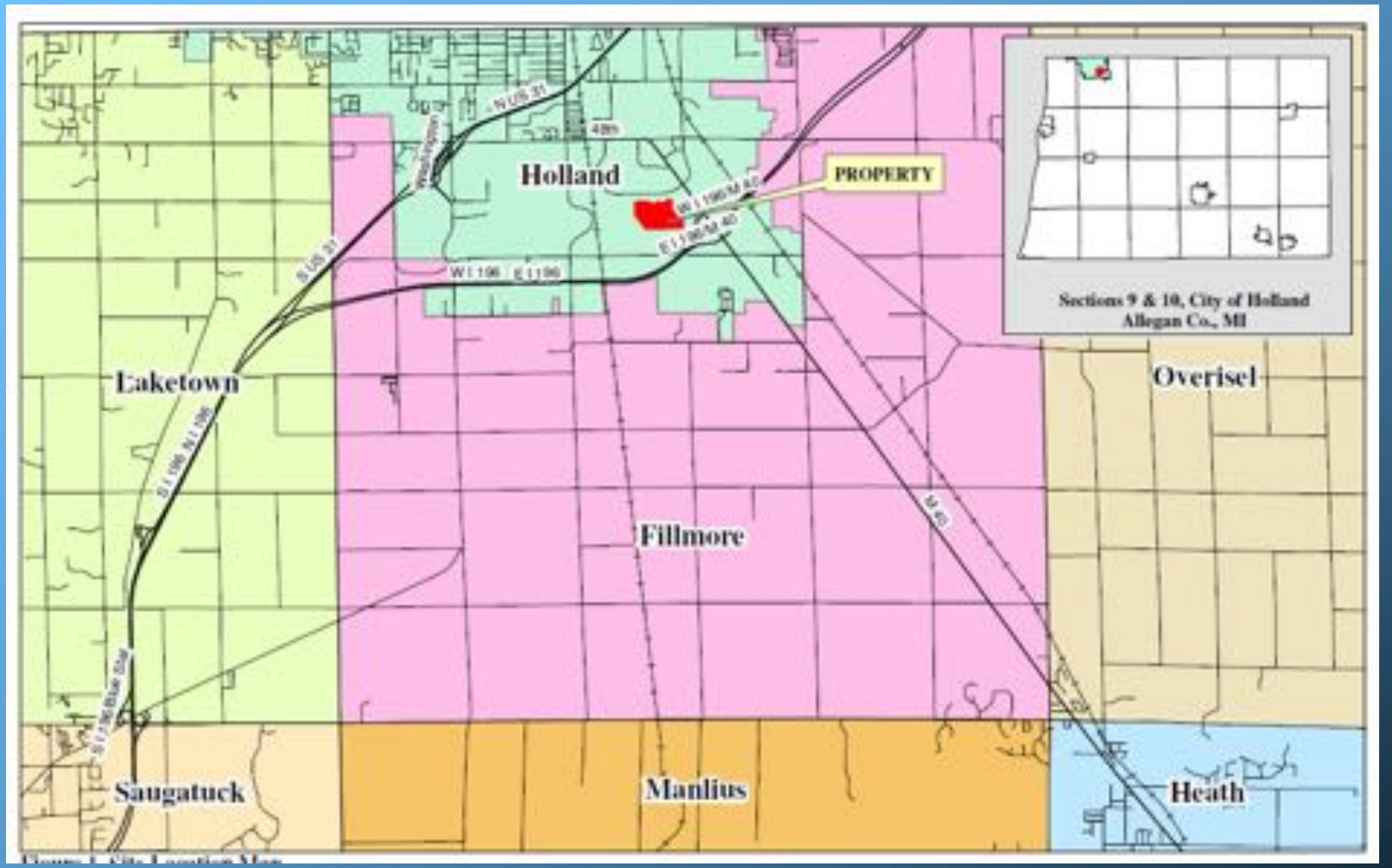
- Restoration Plan = $11,976,000
- Major focus on public / private partnership



The Macatawa Watershed

Macatawa River Watershed Wetland Mitigation Bank

North Branch Subwatershed (#3rd worst)

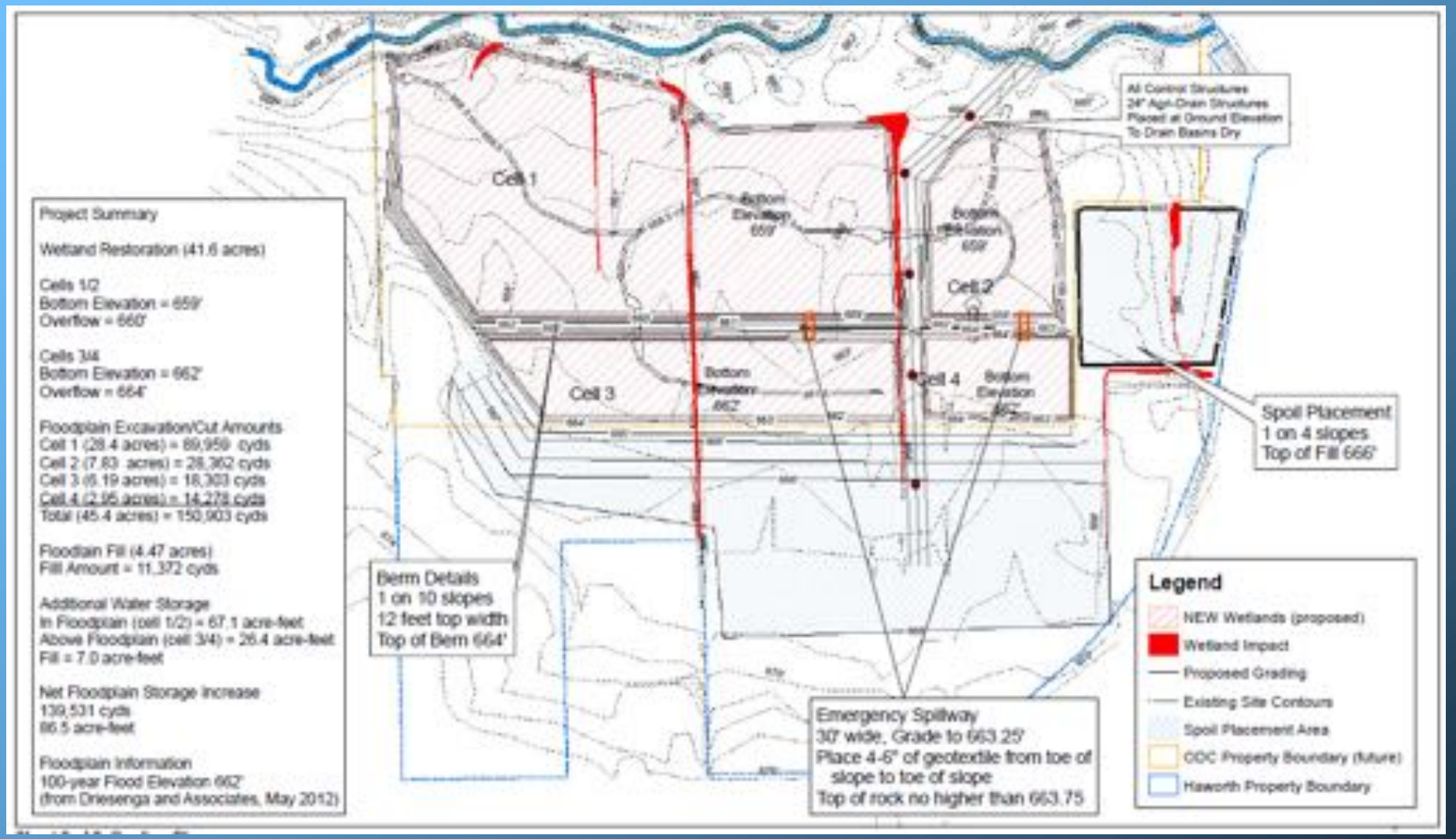


Macatawa River Watershed Wetland Mitigation Bank

MDEQ Wetland Restoration Potential

Macatawa River Watershed Wetland Mitigation Bank

Site Plan



Permitting Process

- Filling of 1.28 acres of agricultural ditches required MDEQ permit
- General Permit S for Wetland Restoration
- MDEQ notified MDOT Aeronautics of application due to the vicinity to an airport

Airport Approach Zone

Permitting Process

- MDOT letter to MDEQ stating project DOES present a potential conflict to project based on FAA, Advisory Circular, 1500/5200-33B
- 5,000/10,000-foot and 5-mile criteria
- Recommended working with NRCS Wildlife Services to determine if project will increased hazard

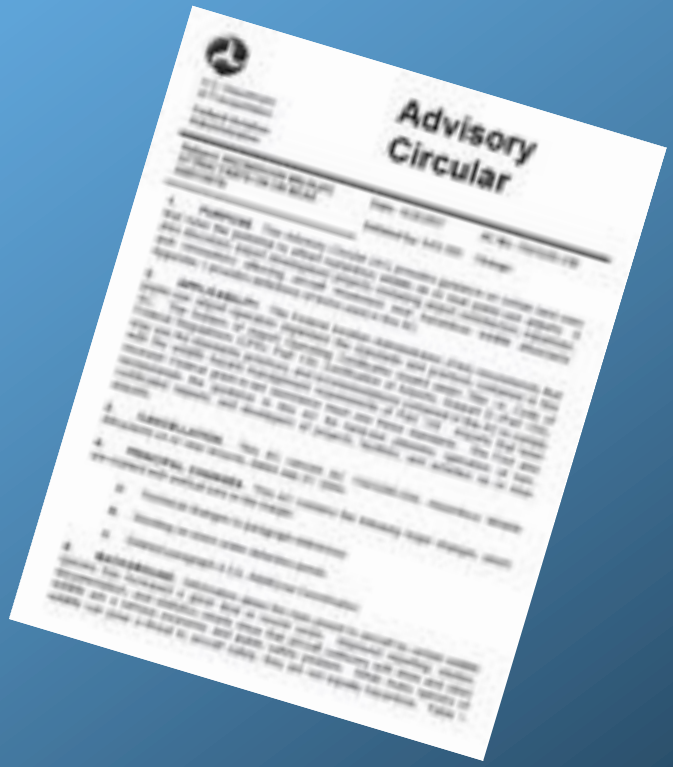

Advisory Circular

Table 1. Ranking of 25 species groups as to relative hazard to aircraft (1=most hazardous) based on three criteria (damage, major damage, and effect-on-flight), a composite ranking based on all three rankings, and a relative hazard score. Data were derived from the FAA National Wildlife Strike Database, January 1990–April 2003.[1]

Species group	Ranking by criteria			Composite ranking[2]	Relative hazard score[3]
	Damage[4]	Major damage[5]	Effect on flight[6]		
Deer	1	1	1	1	100
Vultures	2	2	2	2	64
Geese	3	3	6	3	55
Cormorants/pelicans	4	5	3	4	54
Cranes	7	6	4	5	47
Eagles	6	9	7	6	41
Ducks	5	8	10	7	39
Osprey	8	4	8	8	39
Turkey/pheasants	9	7	11	9	33
Herons	11	14	9	10	27
Hawks (buteos)	10	12	12	11	26
Gulls	12	11	13	12	24
Rock pigeon	13	10	14	13	23
Owls	14	13	20	14	23
H. larks/s. bunting	18	15	15	15	17
Crows/ravens	15	16	16	16	16
Coyote	16	19	5	17	14
Mourning dove	17	17	17	18	14
Shorebirds	19	21	18	19	10
Blackbirds/starling	20	22	19	20	10
American kestrel	21	18	21	21	9
Meadowlarks	22	20	22	22	7
Swallows	24	23	24	23	4
Sparrows	25	24	23	24	4
Nighthawks	23	25	25	25	1

FAA Advisory Circular

- Recommends Against (within 5 miles)
  - Waste Disposal Facilities
  - Water Management Facilities
  - Agricultural Activities
  - Golf Course, Landscaping (turfgass), Synergistic effects of two land uses
  - Wetlands
    - “FAA recommends that wetland mitigation projects that may attract hazardous wildlife be sited outside of the [5 mile radius]”

NRCS Wildlife Services

- On-site meeting and discussion of land use changes
- Current condition – cut corn field with pockets of seasonally standing water (geese attractant)

Addressing Concerns

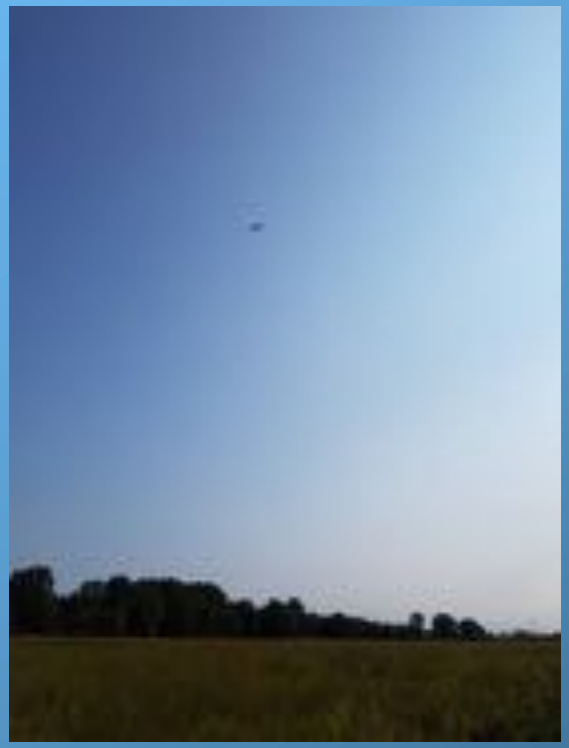
- Wet meadow (100% vegetated) wetland to reduce large bird use
- Local Airport Board
- Wildlife Monitoring and Contingency Plan
  - Partnering with Hope College
  - Contingency – expected a few years for site vegetation to develop

Construction Complete

Spring – Year 2

Airport concerns

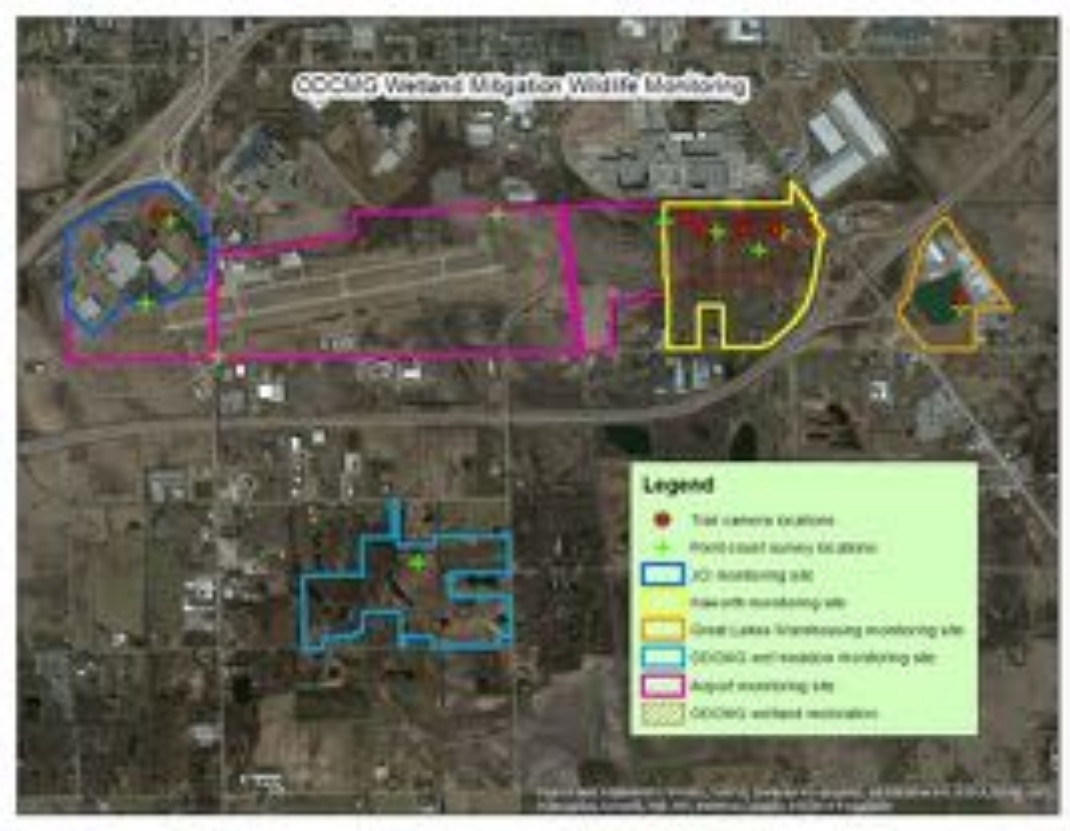
- Wetland is directly underneath West Michigan Regional Airport eastern approach
- Aircraft strikes cost US $155 Million annually (Dolbeer et al., 2013)
- Safety Risks



Monitoring Program

- Scientific study to determine the following:
  - What species are utilizing the restoration site?
  - When do we see the highest Dolbeer score?
  - How do visiting species change in relation to vegetation type?

- Identified 5 different habitat types for comparison
  - Restoration site
  - Established wet meadow
  - Maintained open water
  - Overgrown open water
  - Airport
- Two approach design
  - Active monitoring
  - Passive monitoring



Active Monitoring

Point-count Survey

- 9 points visited 4 times a month
  - Two at dawn
  - Two at dusk
- Sites were surveyed for 10 minute intervals
- All wildlife was documented and later given a “Dolbeer score”

Passive Monitoring

- Bushnell trail cameras were used in 6 locations
  - 4 on restoration sites
  - 2 on adjacent properties with varying vegetative structures
- Picture set to take a picture every 5 minutes and/or when the sensors detect motion
- Achieved ~75% visual coverage of the site


SITE D0 42F5℃
03-04-2017 14:30:00

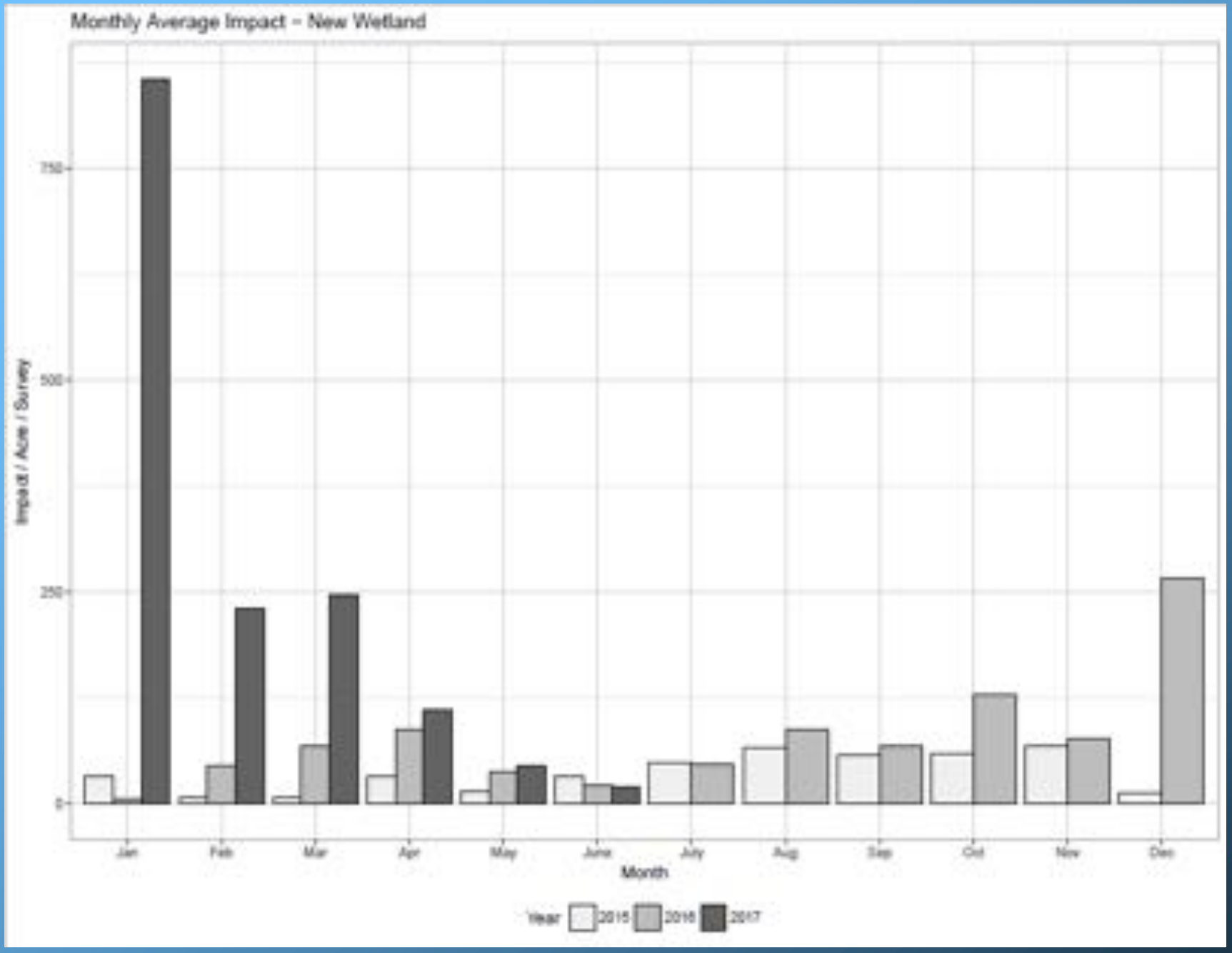

SITE B 39°F3°C
04-18-2017 06:52:09

Waterfowl Problems

Cell 1 Camera A

Cell 1 Camera B


Abundance Proportions
2015
2016
2017
Airport
New Wetland
Open Water
War Memorial
Percent of Each Month's Total Abundance
100
75
50
25
0
Jan Feb Mar Apr May June July Aug Sep Oct Nov Dec
Month
Species Group
BLACKBIRD
CROW
DEER
DOVE
DUCK
GEESE
GULL
MAMMAL_SM
RAPTOR
SMALL
TURKEY
WADER


Monthly Average Impact – New Wetland
Impact / Acre / Survey
750
500
250
0
Jan
Feb
Mar
Apr
May
June
July
Aug
Sep
Oct
Nov
Dec
Month
Year
2015
2016
2017

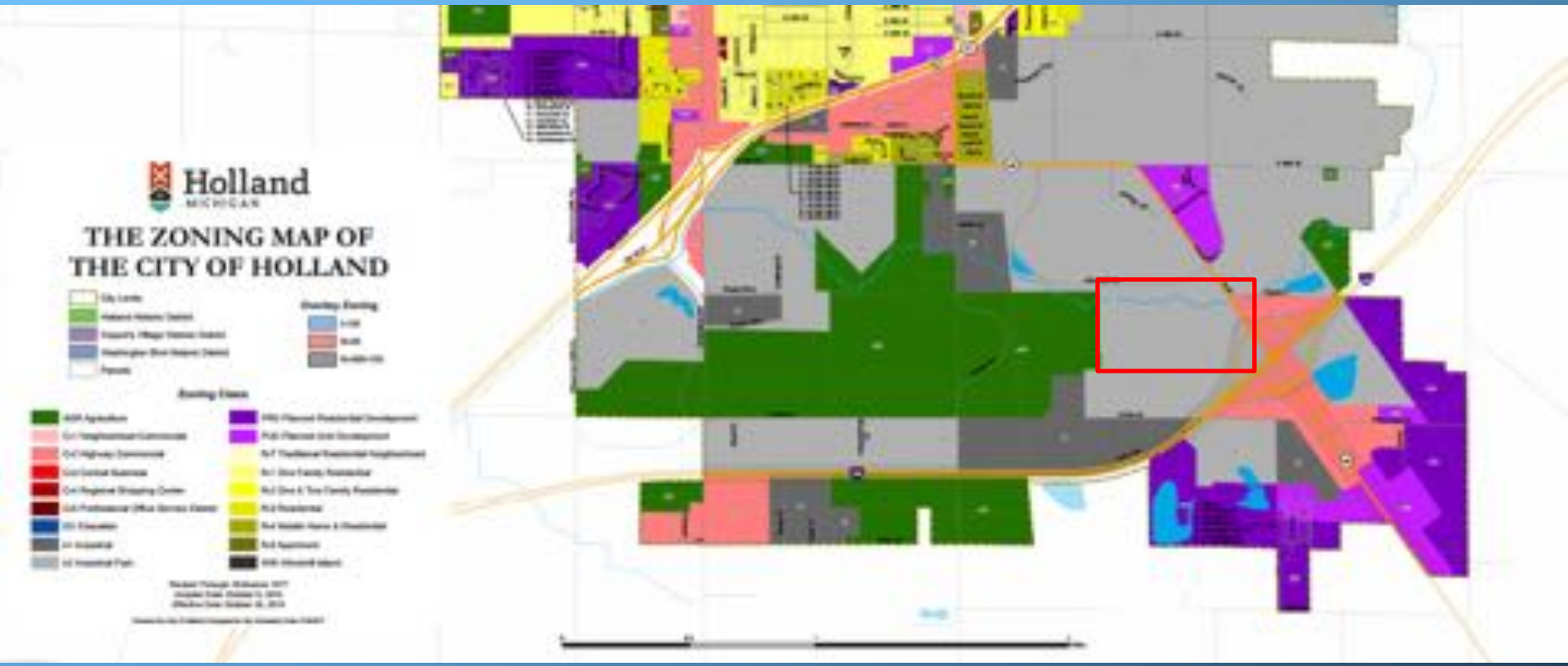
Visual Deterrents

- Installed iridescent foil tape in areas that high populations of waterfall were observed
  - Moderately effective and after a short time not effective at all
  - Birds became accustomed to the presence of tape
    - Would require moving deterrents every couple days
    - Not viable solution

Predatory Response

- Placed multiple coyote decoys near areas with high waterfowl visitation
  - Extremely effective in short term control
  - Stopped waterfowl from landing but caused bigger issues with large population of migratory birds
    - Large group would come in and begin circling the area
    - ~200 feet above wetland
  - Eventually birds became accustomed and would disregard decoys
- Concluded that visual deterrents were not effective in this situation due to circling behavior and continual intervention by staff

Zoning Issues



Too much water

- Site was designed with two week water cycle
  - During periods of heavy rain or snow melt we were unable to get rid of water fast enough
- High water was effecting our vegetation structure
  - Seeing overabundant cattail
  - Left many areas completely void of vegetation which exasperated the waterfowl problem

Modify the Habitat to Reduce the Hazard

Lower the
Existing Outlet

Install a 2nd
Outlet Structure

Acknowledgements

- **Project Clarity Donors**
  (financial assistance)
- **Haworth Corporation**
  (land donation and support)
- **Hope College (Dr. Kathy Winnett-Murray and Dr. K. Greg Murray)**
  (research and monitoring assistance)
- **Connan Inc.**
  (excavating contractor)

Questions?

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