

Cuddy Intercounty Drain Hearing of Necessity

On Behalf of:

Cuddy Intercounty Drain Drainage Board

Wayland Twp., Allegan County and Yankee Springs Twp., Barry County



By:

**Land and Resource Engineering, Inc.
Streamside Ecological Services**



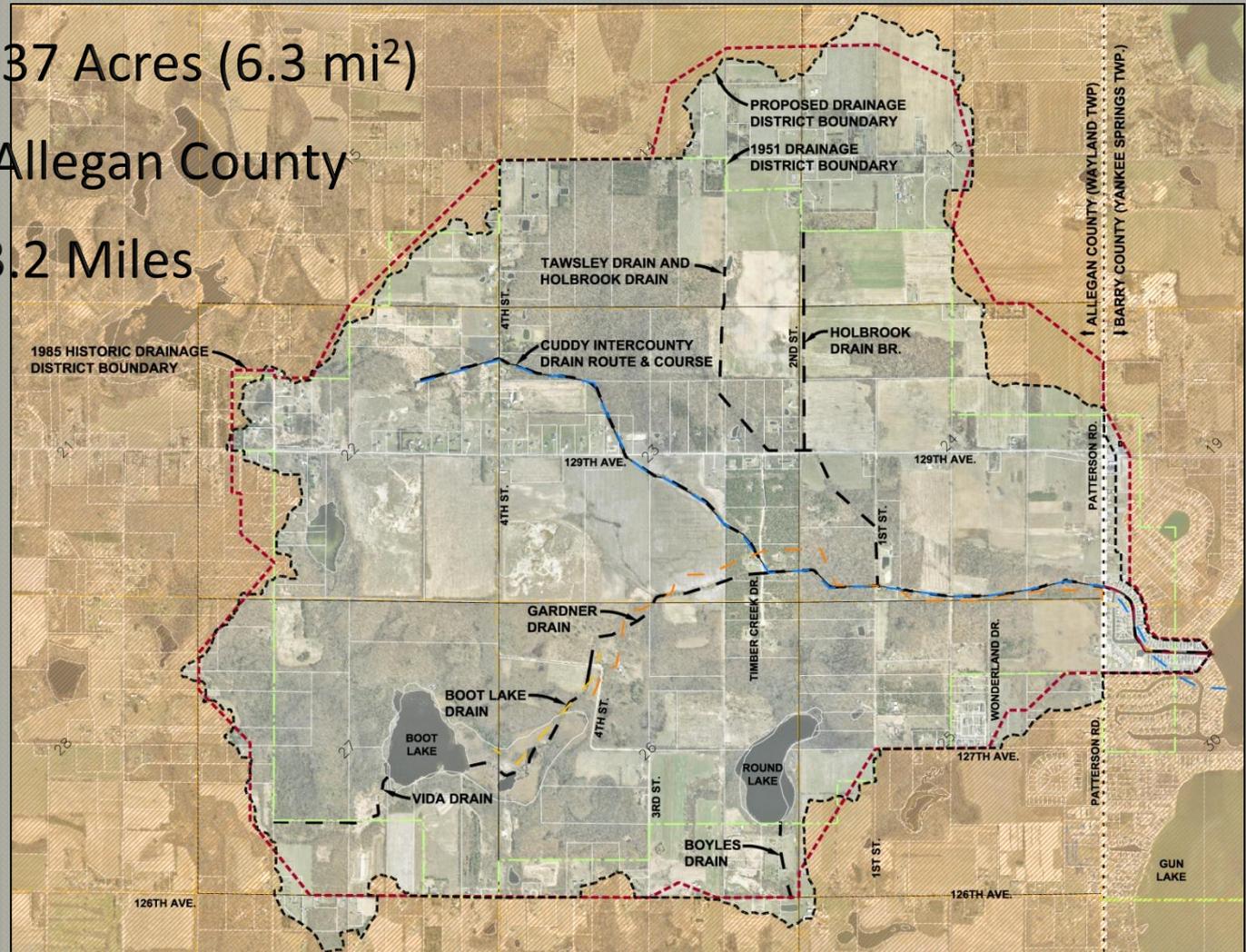
Presentation Overview

- Watershed Overview
- Current Petition / Project Goals
- Drain History
- Existing Conditions
- Water Quality Concerns
- Recommendations
- Preliminary Cost Estimate
- Apportionment
- Project Schedule
- Add / Remove Lands



Watershed Overview

- Area: 4,037 Acres (6.3 mi²)
- 98.7% in Allegan County
- Length: 3.2 Miles

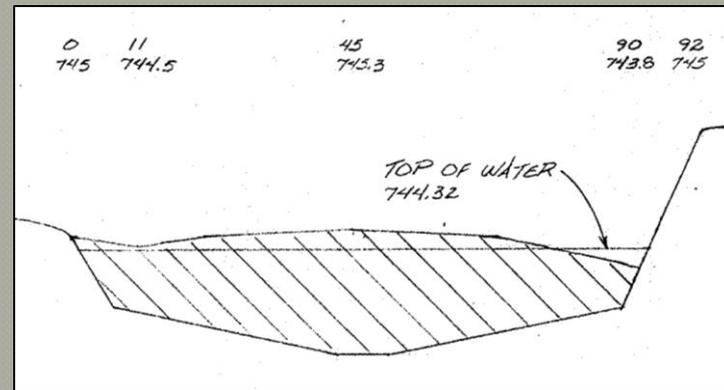


Current Petition / Project Goals

- Current Petition filed by Wayland Township on June 3, 2013 and found “Practicable” on September 25, 2013.
- Project Goals:
 1. Prevent Flooding on developed property.
 2. Limit Debris Delivery to navigable channel / Gun Lake.
 3. Limit Sediment Delivery to navigable channel / Gun Lake.
 4. Prevent or Minimize *E-Coli* contamination.
 5. Estimated Project is “Fair and Equitable”.

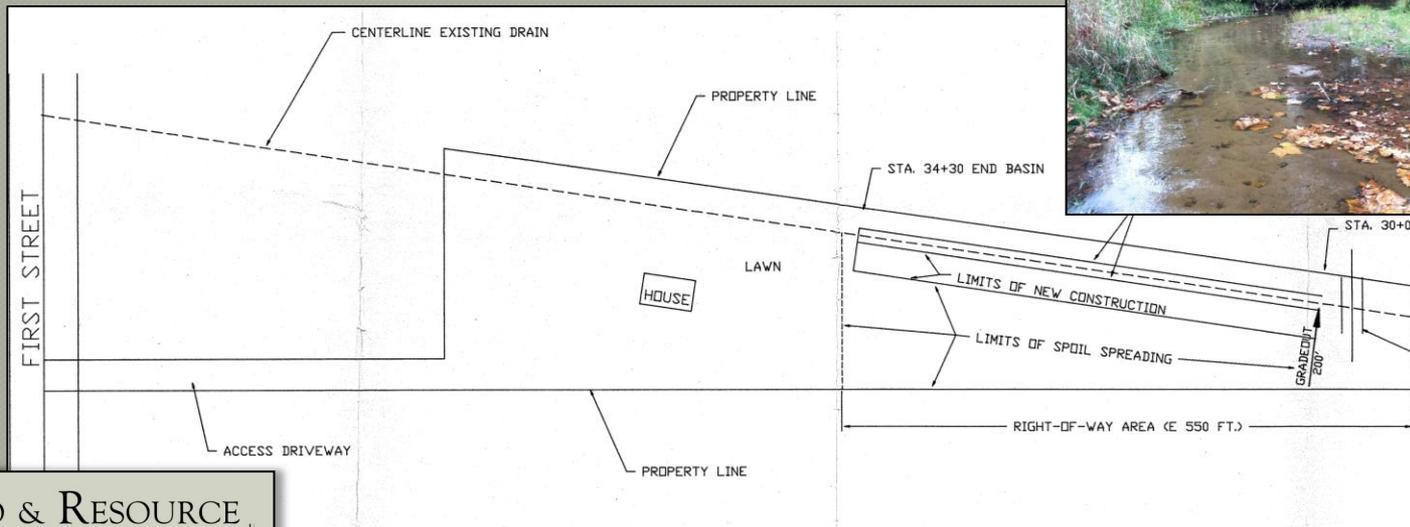
Drain History – 1985 Dredge Project

- 12,000 Cubic Yards of Sediment Dredged from Navigable Channel (East of Patterson Road).
- Depth of Sediment Protruded up to 1-ft above Legal Lake Level.
- Channel Dredged to a Depth of 4-ft below Legal Lake Level.



Drain History – 1991 Sediment Basin

- Constructed between First St. and Patterson Ave. (Sweeney Property) to reduced Sediment Delivery to Nav. Channel.
- Maximum Capacity of Sediment Sump ~ 450 Cubic Yards.
- On-Site Disposal Area Exhausted.



Drain History – Late 1990's

- 1996 Petition to Add Island Drive Channel to Drainage District found “Not Practicable”.
- June 20, 1997 Storm caused Washout of Patterson Road and Flooding at 2814 Patterson Road.
- 1997 Emergency Repairs.



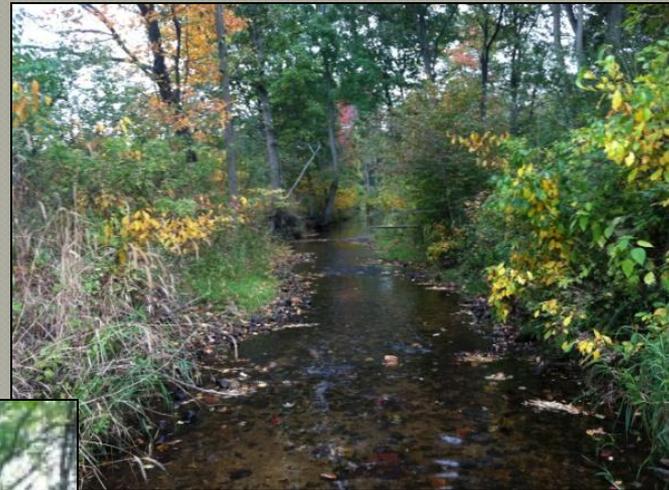
Drain History – Recent Developments

- Regular Maintenance.
- 2011-2013 – Complete Design of Patterson Road Culvert Replacement.
- April 2013 Storm caused partial Washout of First Street.



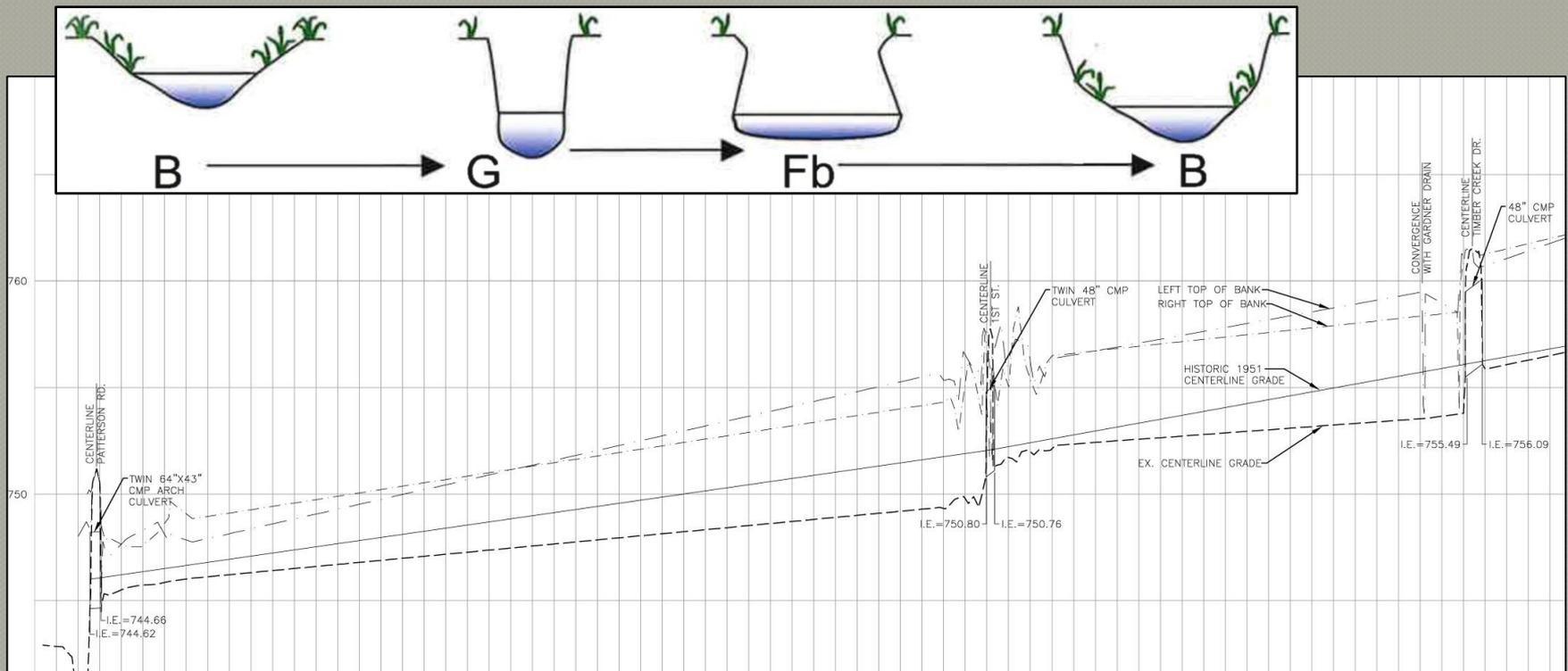
Existing Conditions – General

- Channel Generally Stable and Capable of Transporting Supplied Sediment Load.



Existing Conditions – Head-Cut

- Channel Head-Cut between Patterson Rd. and Timber Creek Dr.



Existing Conditions – Erosion

- Major Area of Channel Instability and Bank Erosion downstream of Timber Creek Drive.



Existing Conditions – Crossings

- County Road Crossings have 10-yr to 100-yr Hydraulic Capacity.
- Private Crossing have 5-yr to 10-yr Hydraulic Capacity.
- Road Crossings at Patterson Rd., First St., and Private Crossings at or near Timber Creek Dr. in Poor Condition.



Existing Conditions – E. of Patterson

- Approximately 300-ft long Sediment Bar (Sand) downstream of Patterson Road.
- Water Depths as Low as 1-ft near Patterson Road.
- Approximately 1,700 cubic yards of Sediment Removed 3-years ago.



Existing Conditions – Gardner

- Generally Stable and in Good Condition upstream of Timber Creek Drive.
- Major Area of Channel Instability downstream of Timber Creek Drive.
- Perched Culvert at Timber Creek Drive.



Water Quality Concerns – Sediment

- Sediment Transport is Natural Process.
- Annual Sediment Load is approximately 400 cubic yards.
- Dredging of Navigable Channel required every 25-30 years.
- Area of Channel Instability and Excess Sediment Supply located near Timber Creek Drive.



Water Quality Concerns – Debris

- Woody Debris is a Natural and Critical Part of Healthy Stream Systems.
- Cuddy and Gardner generally free of Obstructions.
- Highest Concentration of Woody Debris between Timber Creek Drive and First Street.



Water Quality Concerns – *E-Coli*

- Potential elevated *E-Coli* concentrations.
- No evidence to Support that Cuddy is the Source, only the Conduit for *E-Coli* Contamination.
- Potential Sources include Illicit Connections (Human Waste), Agricultural Practices, and Wildlife.
- Additional Study Required.



1. Prevent Flooding

Replace Deteriorating and Undersized Crossings at:

- Private Farm Drives (2) upstream of Timber Creek Drive.
- Timber Creek Drive (Cuddy and Gardner) .
- First Street.
- Patterson Road.



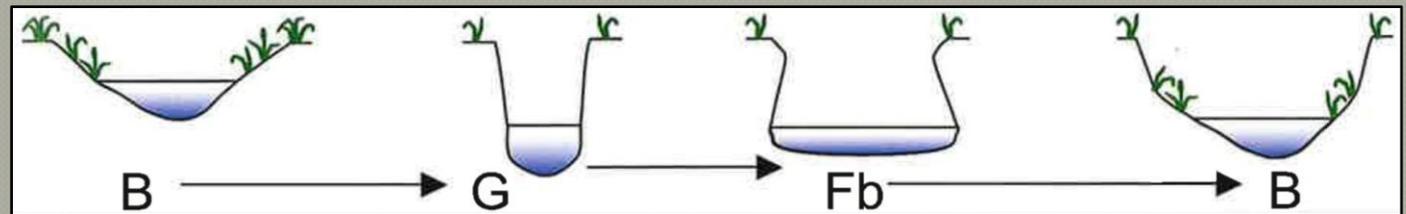
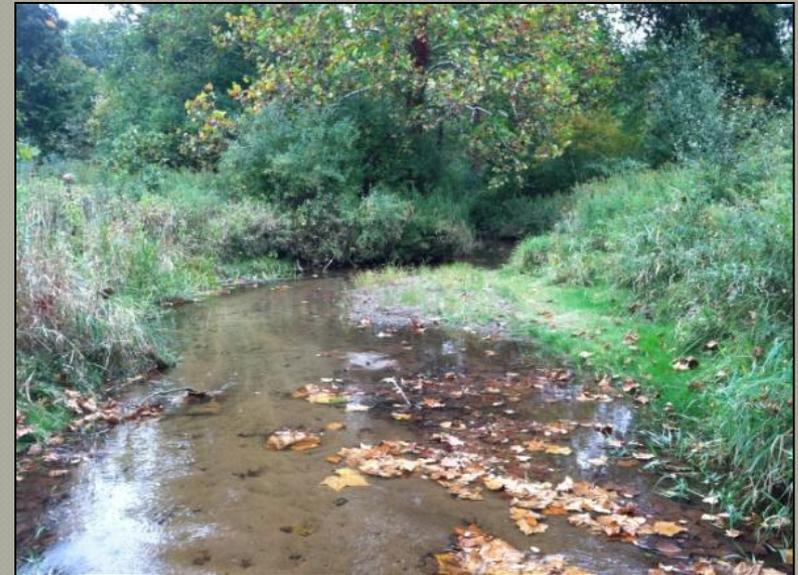
2. Limit Debris

- Stabilize Eroding Channel Banks between Timber Creek Drive and First Street.
- Conduct Woody Debris Management along the Cuddy and Gardner to Remove Log Jams and Dead or Leaning Trees within the Drain R.O.W.
- Install Debris Catcher along Open Channel.



3. Reduce Sediment Load

- Stabilize Eroding Channel Banks between Timber Creek Drive and First Street.
- Stabilize Culvert Outlets and Provide adequate Grade Control Structures.
- Relocate or Maintain Existing Sediment Basin.



4. Prevent or Minimize *E-Coli*

- Outside Normal Duties of Drainage Board.
- Consider Study to Determine Potential Illicit Connections.
- Work with local partnering agencies to pursue additional study and implementation of BMPs to reduce *E-Coli* levels.



5. Fiscal Responsibility

- Work with Road Commission to Reduce Culvert Replacement Costs.
- Investigate Potential Grants to Help Offset Project Cost.
- Review Apportionment between Counties.



Preliminary Project Cost Estimate

- Gardner Drain (Allegan County) - \$50,000
- Drain Improvements, West of Patterson - \$125,000
- Dredging, w/in 400-ft East of Patterson - \$175,000
- Dredging, Navigable Channel East of Patterson - \$250,000
- Sediment Basin - \$70,000
- **First Street Culvert Replacement - \$250,000 (ACRC)**
- **Patterson Road Culvert Replacement - \$330,000 (1/2 ACRC)**

***PRELIMINARY ESTIMATE OF PROJECT COST ~ \$800k - 1.25M**

**Note – Does not include Legal, Administrative, Permitting, Mitigation, Remediation or Financing Costs.*

Apportionment Between Counties

- Gardner Drain (Alleghen County) - 100% Alleghen
- Drain Improvements, West of Patterson - 100% Alleghen
- **Dredging, w/in 400-ft East of Patterson - TBD**
- Dredging, Navigable Channel East of Patterson - 100% Barry
- Sediment Basin - 50% Alleghen / 50% Barry
- First Street Culvert Replacement - 100% Alleghen (ACRC)
- Patterson Road Culvert - 25% Alleghen / 25% Barry / 50% ACRC

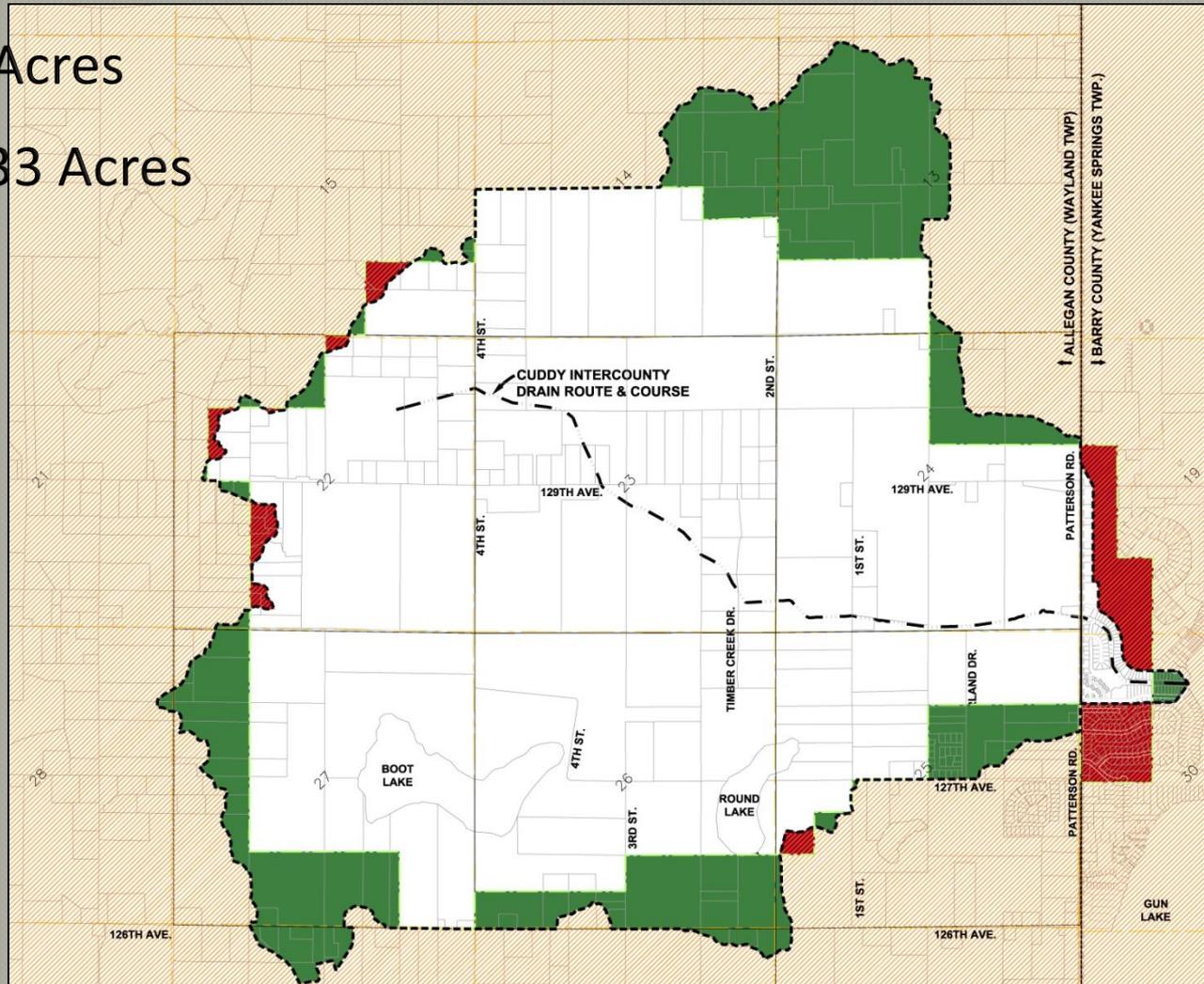
APPORTIONMENT BASED ON FINAL PROJECT SCOPE AND COST

Project Schedule

Task	2014				2015			
	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter
Topographic Survey	■							
Engineering Design	■	■	■					
Easement Acquisition	■	■	■	■				
Permitting	■	■	■	■				
Bidding		■	■	■	■			
Construction			■	■	■	■	■	

Add / Remove Lands

- Add 759.1 Acres
- Remove 133 Acres



Questions / Public Comment
