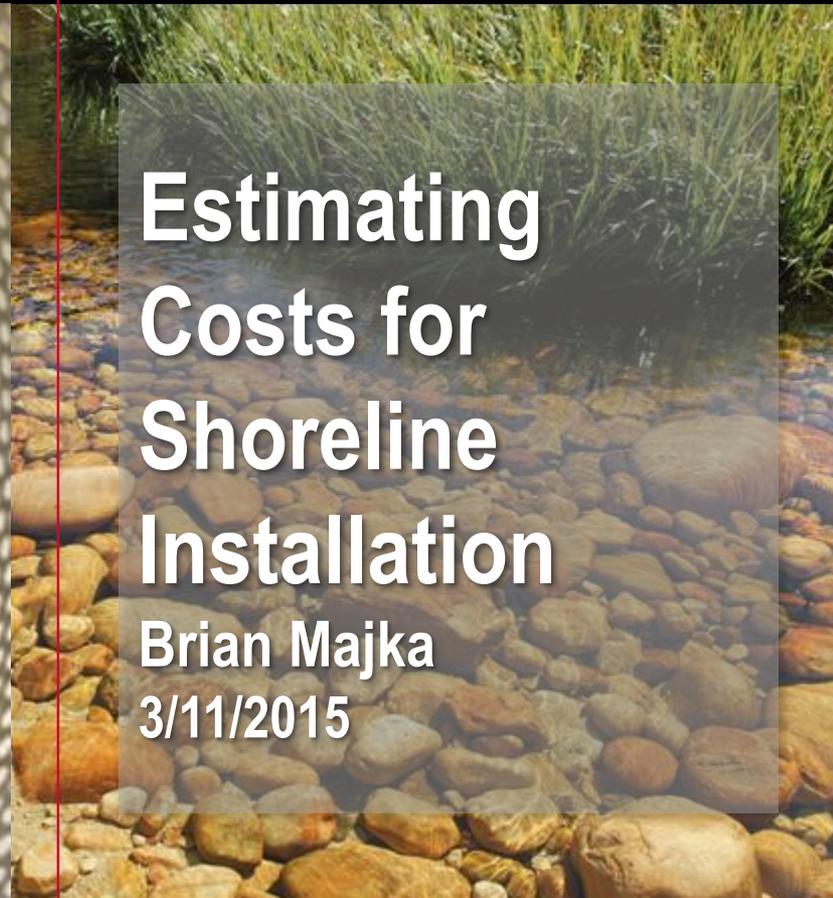
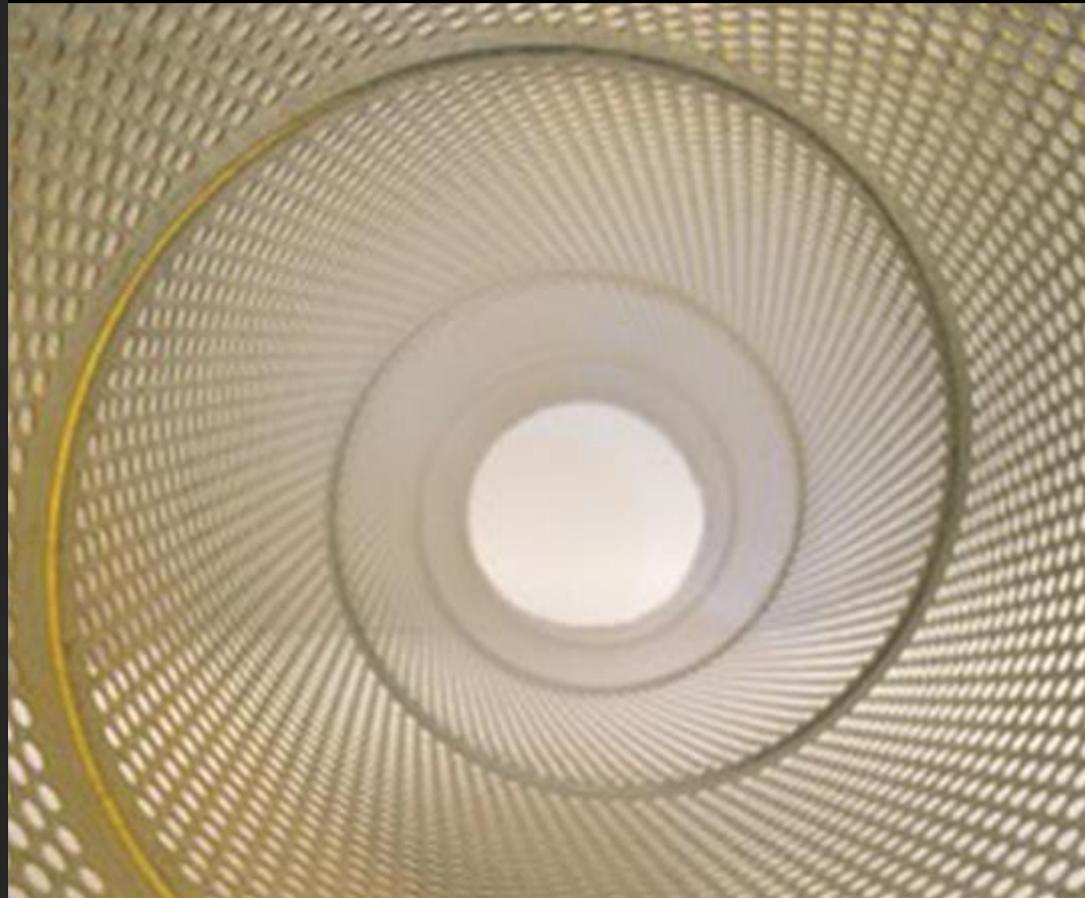


consulting engineers and scientists



Estimating Costs for Shoreline Installation

Brian Majka
3/11/2015



Overview

- Why does cost estimating matter?
- What goes into a natural shoreline project cost?
- How are costs generated?
- Project Example





Why does everyone here need to understand this?



- Regulators—
bonding, cost
assurances
- Grant Reviewers and
Applicants
- Contractors
- Landowners



Why does everyone here need to understand this?



- Regulators—
bonding, cost
assurances
 - Need to verify costs
on permitted projects
for cost assurances



Why does everyone here need to understand this?



- Grant Reviewers and Applicants
 - Reviewers need to be able to verify the validity of costs in grant applications
 - Grant applicants need to understand how much to apply for



Why does everyone here need to understand this?



- Contractors
 - Need to understand how much to charge for a project
 - Need to understand liabilities and risks



Why does everyone here need to understand this?



- Landowners
 - Need to understand if they're being charged fairly or not
 - Need to know what questions to ask
 - Have an understanding of warranties and liabilities



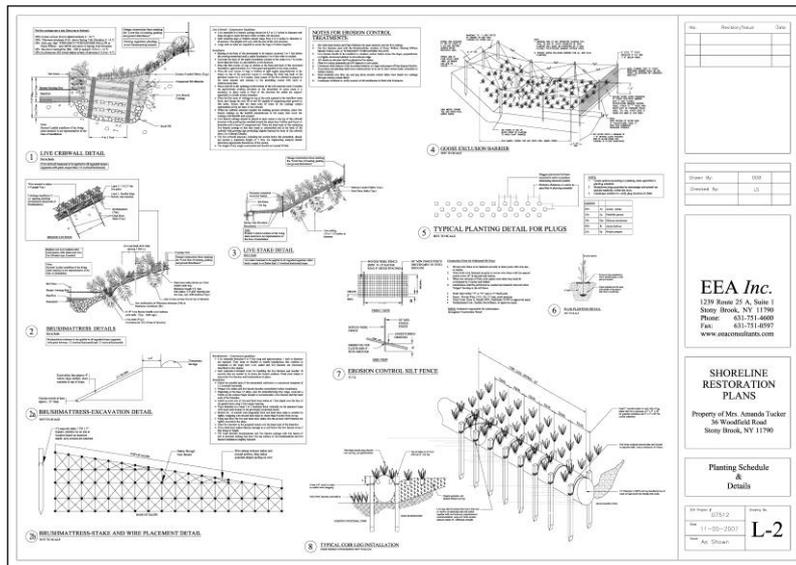
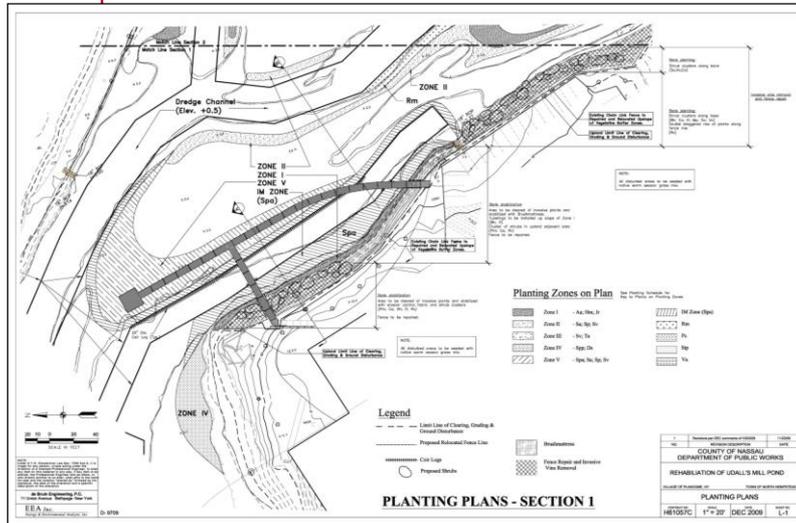
Something to keep in mind...



- Most contractors aren't trying to get rich off of this kind of work
- If they are, they picked the wrong industry and should have become bankers instead



How is your project coming together?



- Has it already been designed?
- Has it already been funded?
- What is your role?
- Do you have any flexibility?
- What are you trying to actually accomplish?
- Is it a bid, a grant, a private design-build?



Bottom line—there are real dollars involved with these projects



- With real dollars come real risk
- Anyone involved must balance risk with cost
- Higher risk=higher cost
- Goal is to get a fair product at a fair price for all involved



What components make up a natural shoreline project?

Three main components of any project:

- Labor
- Materials
- Expenses





How do you get started?

- Are you estimating design, construction, or both?
- Do you have the right team? Do you need to add expertise?
- What are the risks and liabilities?
- What is known? What is unknown?
- When will the work be done?
- Where will you get the material?
- **WHAT ARE THE EXPECTATIONS!**





Tools—Spreadsheets!!!

Project Name: Ford Lake Shoreline Restoration

3/11/2015

Total Project Budget= \$ 24,085

LABOR

MATERIALS and EXPENSES

EXPENSES

		CAD Drafting	Technician 1	Supervisor	Project Manager	Labor Cost	Erosion Control	Plants	Total Materials	Total Markup	Total Mat. with Markup	Mileage	Total Expenses	Subtotal	Project Contingency	Total Cost	
		60	60	75	100					15%					10%		
Task	Task Description																
1	Project Management				15	1500			0	0	0		0	1500	165	1815	
2	Meetings				10	1000			0	0	0	150	150	1150	127	1392	
3	Design	10		8	10	2200			0	0	0		0	2200	242	2662	
4	Permitting	6			8	1160			0	0	0		0	1160	128	1404	
5	Site Preparation		6	6		810			0	0	0		0	810	89	980	
6	Travel		6	6		810			0	0	0	200	200	1010	111	1222	
7	Installation		72	24		6120	2000	500	2500	375	2875		0	8995	989	10884	
8	Site Maintenance		48			2880			0	0	0	200	200	3080	339	3727	
															Total Cost		24085



Labor

- What tasks are needed to complete the project?
 - Project management
 - Design
 - Permitting
 - Installation
 - Maintenance/Warranty





Labor

- How are labor costs determined?
 - “Multiplier”
 - Businesses will typically charge 2-4x the employees pay rate to cover business expenses
 - Contractor must estimate how many hours each task will take, based on each task





Labor

- Project Management
 - Meetings
 - Project coordination
 - Invoicing and contractor management
- Project Design
 - Site survey
 - Site analysis
 - Drafting and design
 - Review





Labor

- Permitting
 - Application
 - Drawings
 - Agency negotiations and review
- There's a lot that goes into a project before anything goes in the ground!





Labor

- Installation
 - Site preparation
 - Travel
 - Installation of bioengineered materials
 - Planting
 - Seeding
- Production Rates
 - Linear ft/man hour
 - Blankets/man hour
 - Plants/man hour





Labor

- Warranty/Maintenance
 - Weeding
 - Repairs
 - Questions
 - Reporting for permit
 - Contingency





Materials

- Get actual quotes from vendors when possible
- Each material needed for the project must be accounted for
 - Bioengineering materials
 - Erosion blankets
 - Coir logs
 - Stakes
 - Rope
 - Plants
 - Seed



Expenses

- Contractor must charge for expenses associated with the project
 - Mileage to/from site
 - Equipment rental
 - Subcontractors
 - Food/lodging
 - Surveying
 - Permit fees



Tricky things to think about

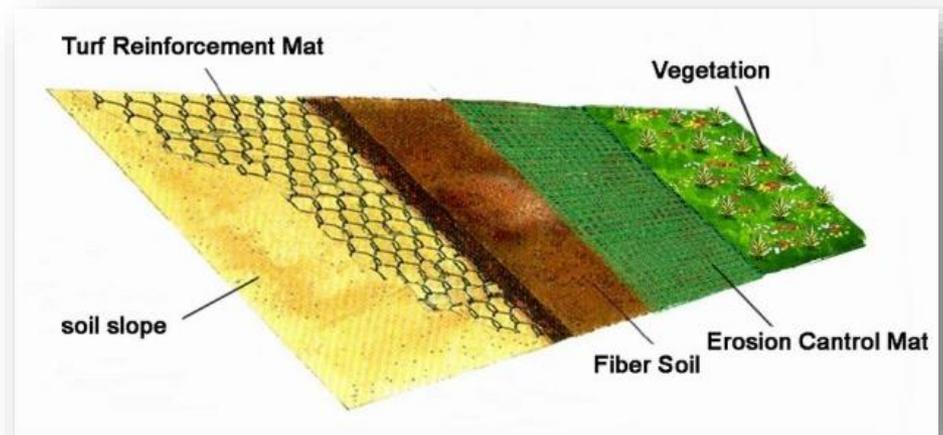
- What are expectations?
- What will site access be like?
- Will site conditions slow construction?
- How many meetings will you actually need?
- Are there warranties?
- What is the risk if the project fails?
- Are there safety concerns?
- Ummm...bioengineering isn't always the right solution





Some typical costs

- Construction labor=\$45-70/hr
- Skidsteer=\$200-\$300/day
- Erosion blankets=\$1.50-\$2.50/SY installed
- Stone=\$50-\$100/TON installed
- Plants=\$3.50-\$5.00/each, installed





Some Typical Costs

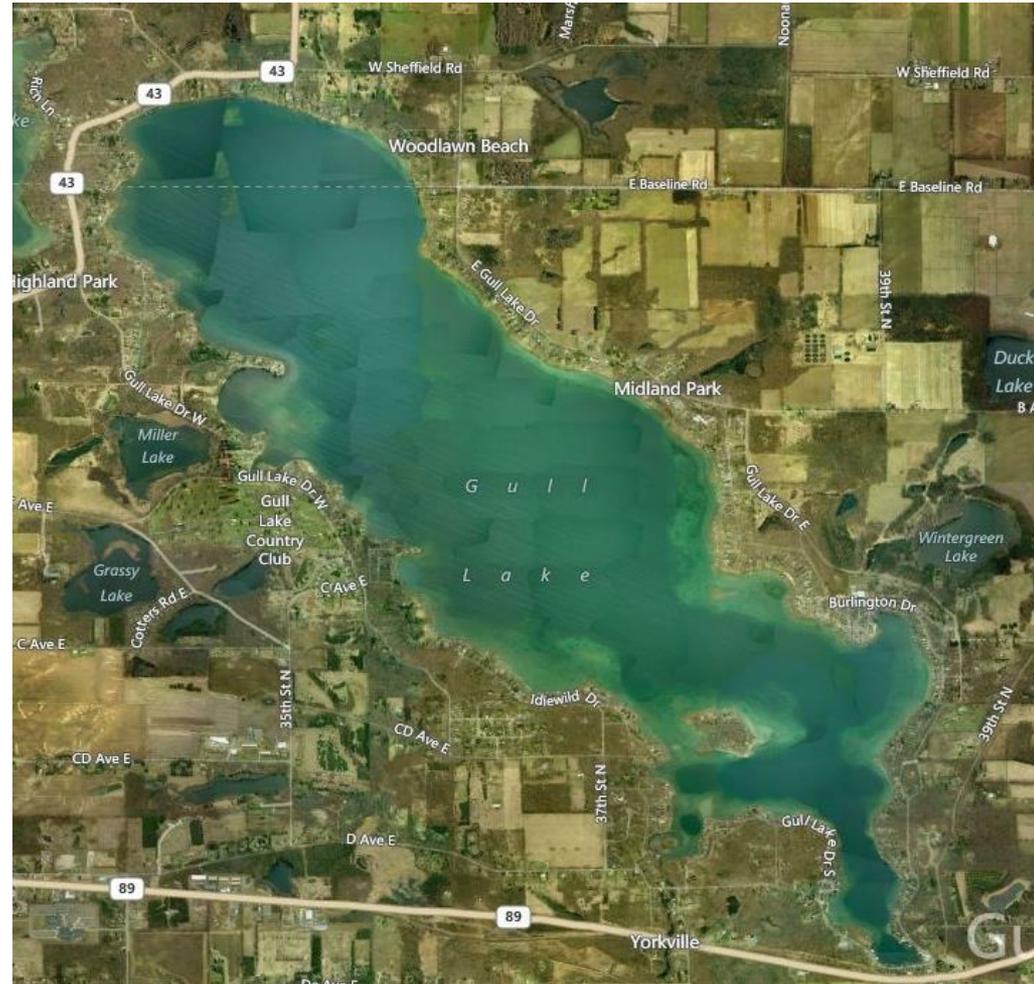
- Coir logs typically \$25-\$40/l.f. installed
- Brush bundles \$20-\$40/l.f. installed
- Bioengineered lifts=\$100-\$400, depending on height
- Silt fence=\$2.00-\$3.00/L.F.



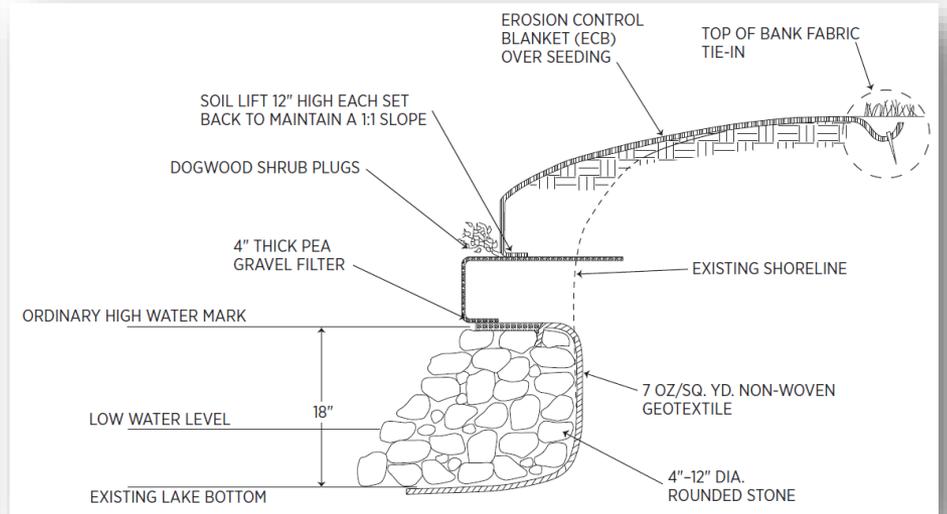


Project Example

- 80 linear ft. on Gull Lake at Kellogg Biological Station
- ~4' high vertical cut bank
- Limited access



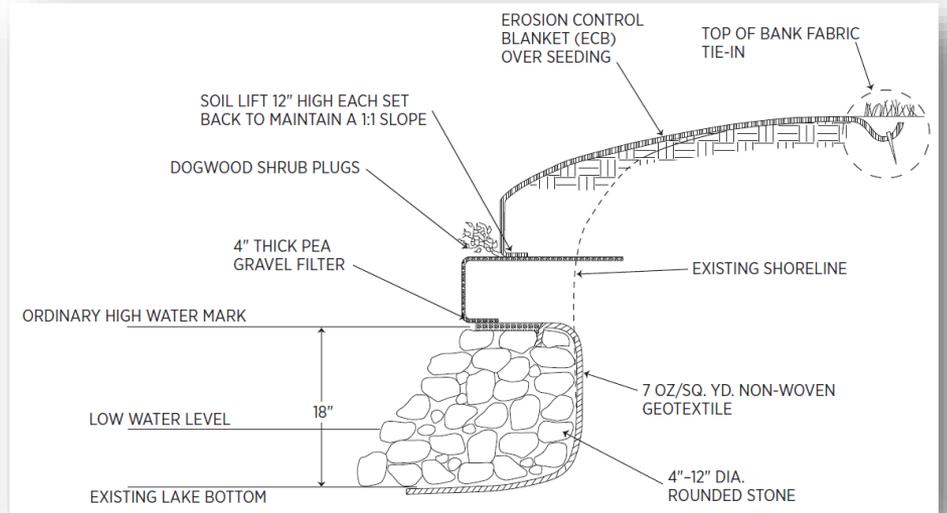
Project Example





Project Example

- So, what do we need?
 - Labor
 - Materials
 - Expenses





Project Example

- So, what do we need?
 - Labor

LABOR

		CAD Drafting	Technician 1	Supervisor	Project Manager	Labor Cost
		60	60	75	100	
Task	Task Description					
1	Project Management				15	1500
2	Meetings				10	1000
3	Design	10		8	10	2200
4	Permitting	6			8	1160
5	Site Preparation		6	6		810
6	Travel		6	6		810
7	Installation		72	24		6120
8	Site Maintenance		48			2880



Project Example

- So, what do we need?
 - Materials
 - 25 ton stone x \$60/ton=\$1,500
 - 2 100' erosion control blankets x \$200/each=\$400
 - Geotextile fabric=\$100
 - Plants=\$500

MATERIALS and EXPENSES

Erosion Control	Plants	Total Materials	Total Markup	Total Mat. with Markup
			15%	
		0	0	0
		0	0	0
		0	0	0
		0	0	0
		0	0	0
		0	0	0
2000	500	2500	375	2875
		0	0	0



Project Example

- So, what do we need?
 - Materials
 - 25 ton stone x \$60/ton=\$1,500
 - 2 100' erosion control blankets x \$200/each=\$400
 - Geotextile fabric=\$100
 - Plants=\$500

MATERIALS and EXPENSES

Erosion Control	Plants	Total Materials	Total Markup	Total Mat. with Markup
			15%	
		0	0	0
		0	0	0
		0	0	0
		0	0	0
		0	0	0
		0	0	0
2000	500	2500	375	2875
		0	0	0



Project Example

- So, what do we need?
 - Expenses
 - Barge to haul stone=\$500/day x 2 days=\$1,000
 - Mileage

EXPENSES

		Mileage	Barge	Total Expenses
Task	Task Description			
1	Project Management			0
2	Meetings	150		150
3	Design			0
4	Permitting			0
5	Site Preparation			0
6	Travel	200	1000	1200
7	Installation			0
8	Site Maintenance	200		200



Project Example

A note about contingency

Project Name: Gull Lake Shoreline Restoration

3/11/2015

Total Project Budget= \$ 25,295

		LABOR					MATERIALS and EXPENSES					EXPENSES					
		CAD Drafting	Technician 1	Supervisor	Project Manager	Labor Cost	Erosion Control	Plants	Total Materials	Total Markup	Total Mat. with Markup	Mileage	Barge	Total Expenses	Subtotal	Project Contingency	Total Cost
		60	60	75	100				15%						10%		
Task	Task Description																
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2	Meetings				10	1000			0	0	0	150		150	1150	127	1392
3	Design	10		8	10	2200			0	0	0			0	2200	242	2662
4	Permitting	6			8	1160			0	0	0			0	1160	128	1404
5	Site Preparation		6	6		810			0	0	0			0	810	89	980
6	Travel		6	6		810			0	0	0	200	1000	1200	2010	221	2432
7	Installation		72	24		6120	2000	500	2500	375	2875			0	8995	989	10884
8	Site Maintenance		48			2880			0	0	0	200		200	3080	339	3727
														Total Cost		25295	



Project Example

\$25,295 for design, permitting, installation /80 l.f.
 =\$316/l.f. for the whole shebang!

Project Name: Gull Lake Shoreline Restoration

3/11/2015

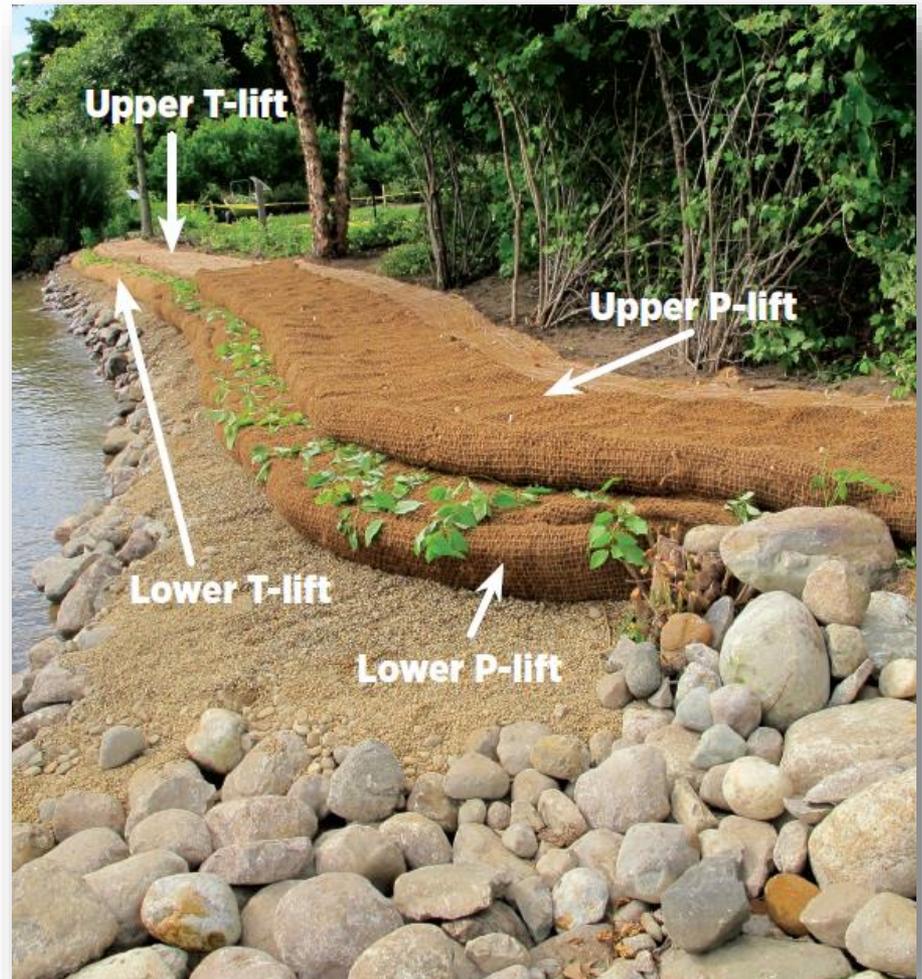
Total Project Budget= \$ 25,295

		LABOR					MATERIALS and EXPENSES					EXPENSES					
		CAD Drafting	Technician 1	Supervisor	Project Manager	Labor Cost	Erosion Control	Plants	Total Materials	Total Markup	Total Mat. with Markup	Mileage	Barge	Total Expenses	Subtotal	Project Contingency	Total Cost
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6	Travel		6	6		810			0	0	0	200	1000	1200	2010	221	2432
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8	Site Maintenance		48			2880			0	0	0	200		200	3080	339	3727
															Total Cost		25295



Cost Gut Checks

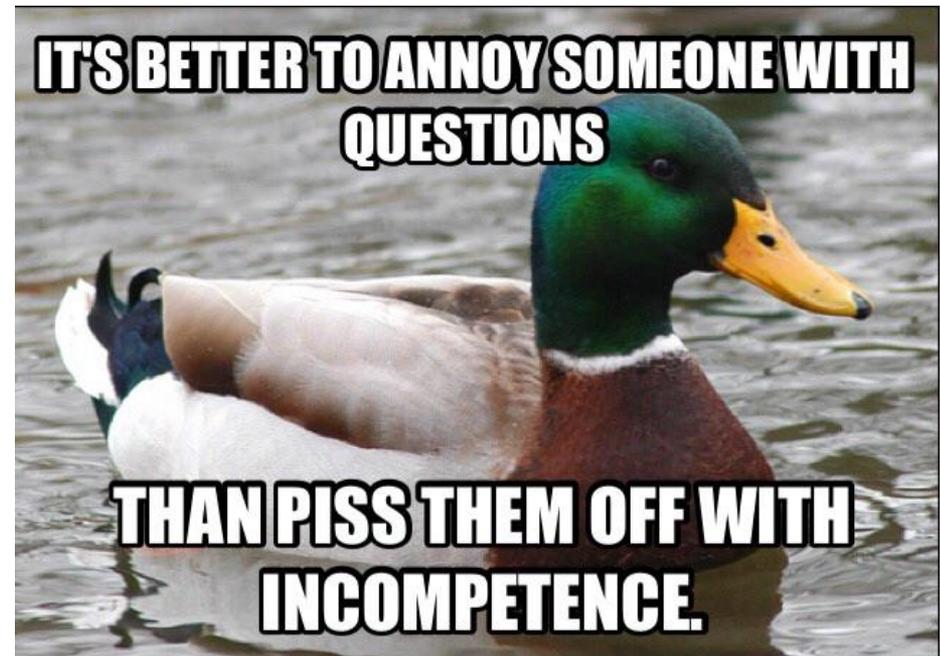
- Gull Lake=\$316/l.f. for lifts, buffer—constructed by barge
- Coir logs typically \$25-\$40/l.f.
- Brush bundles \$20-\$40/l.f.
- Bioengineered lifts=\$100-\$400, depending on height





A few last thoughts

- Document your assumptions
- Don't be afraid to ask questions-of the landowner, vendors, subcontractors, regulators--anyone
- Show your work! You'll be glad you did after you've re-priced the project 4 times
- Don't be afraid to walk away if it's not the right fit—establish your go/no-go criteria and stick with it





In summary

- Understand expectations
- Understand risks and liabilities, regardless of your role in the project
- Remember Labor, Materials, Expenses
- Get the right expertise on your team if needed
- **Don't cut corners--Do good work!**





Thank You!

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