

Lake Restoration in Iowa



IOWA DEPARTMENT OF NATURAL RESOURCES

LEADING IOWANS IN CARING FOR OUR NATURAL RESOURCES

**Working Together to Restore and Protect Iowa's
Significant, Publicly-owned Lakes**

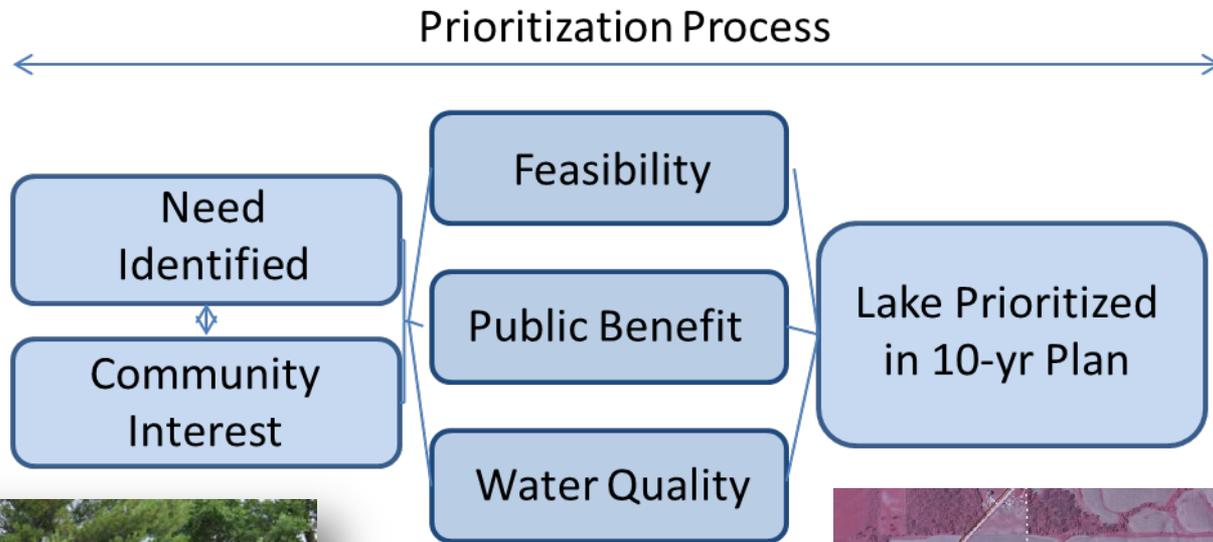
Working Together to Restore and Protect Iowa's Significant, Publicly-owned Lakes

- Collaborating with the public for
 - Improved water quality
 - Quality sport fishery
 - Healthy wildlife habitats
 - Providing Iowans with expanded recreational opportunities

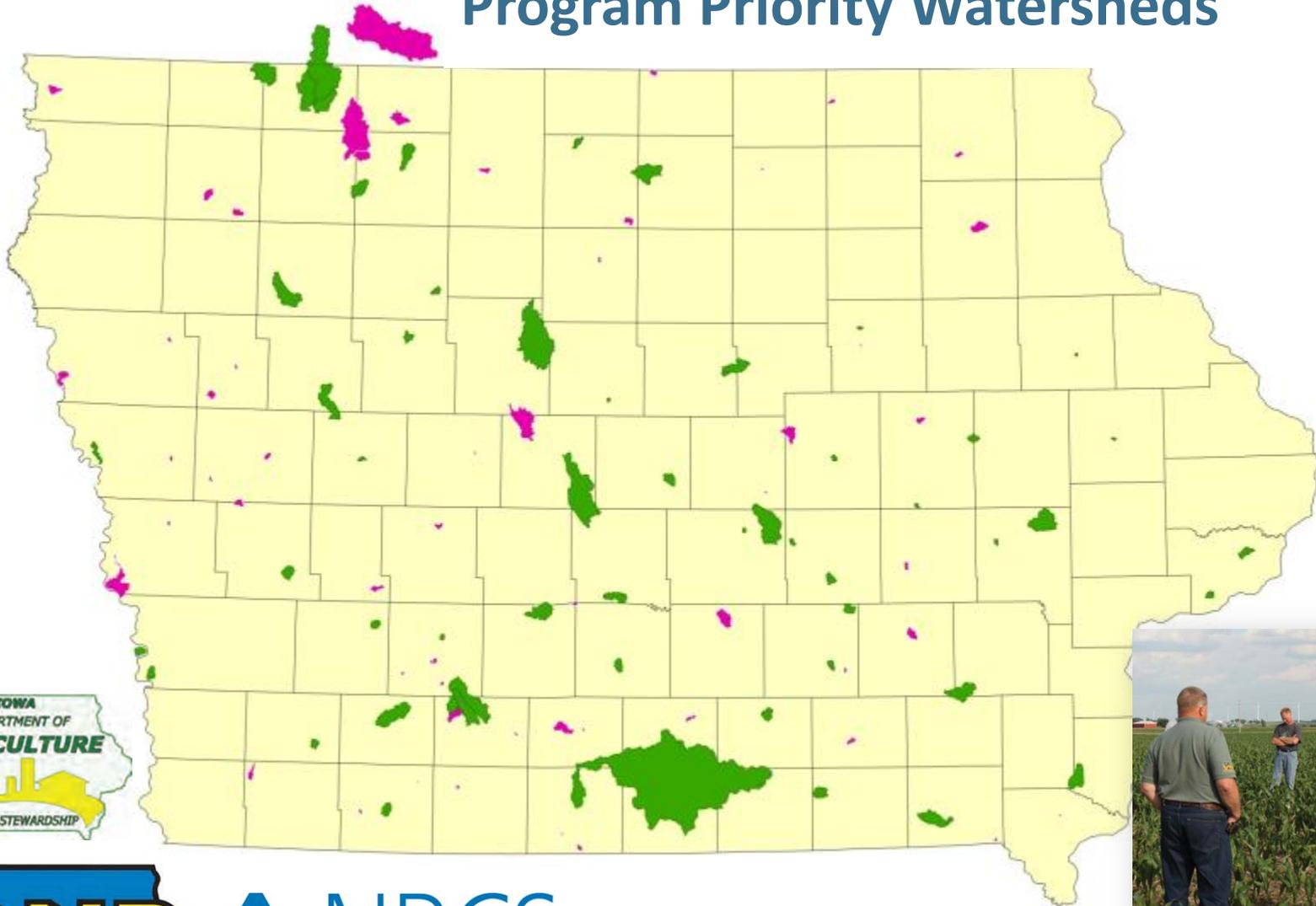
- Program Goals
 - Cost effective investment for Iowa
 - Sustained improvement to water clarity, safety, and overall quality of Iowa Lakes



Lake Prioritization , Planning, and Implementation Process



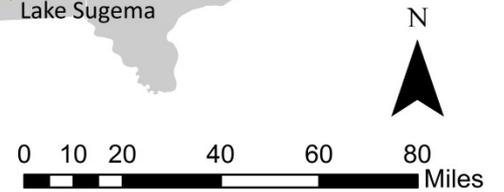
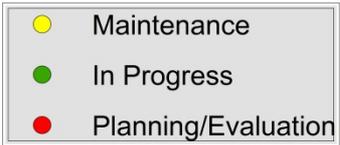
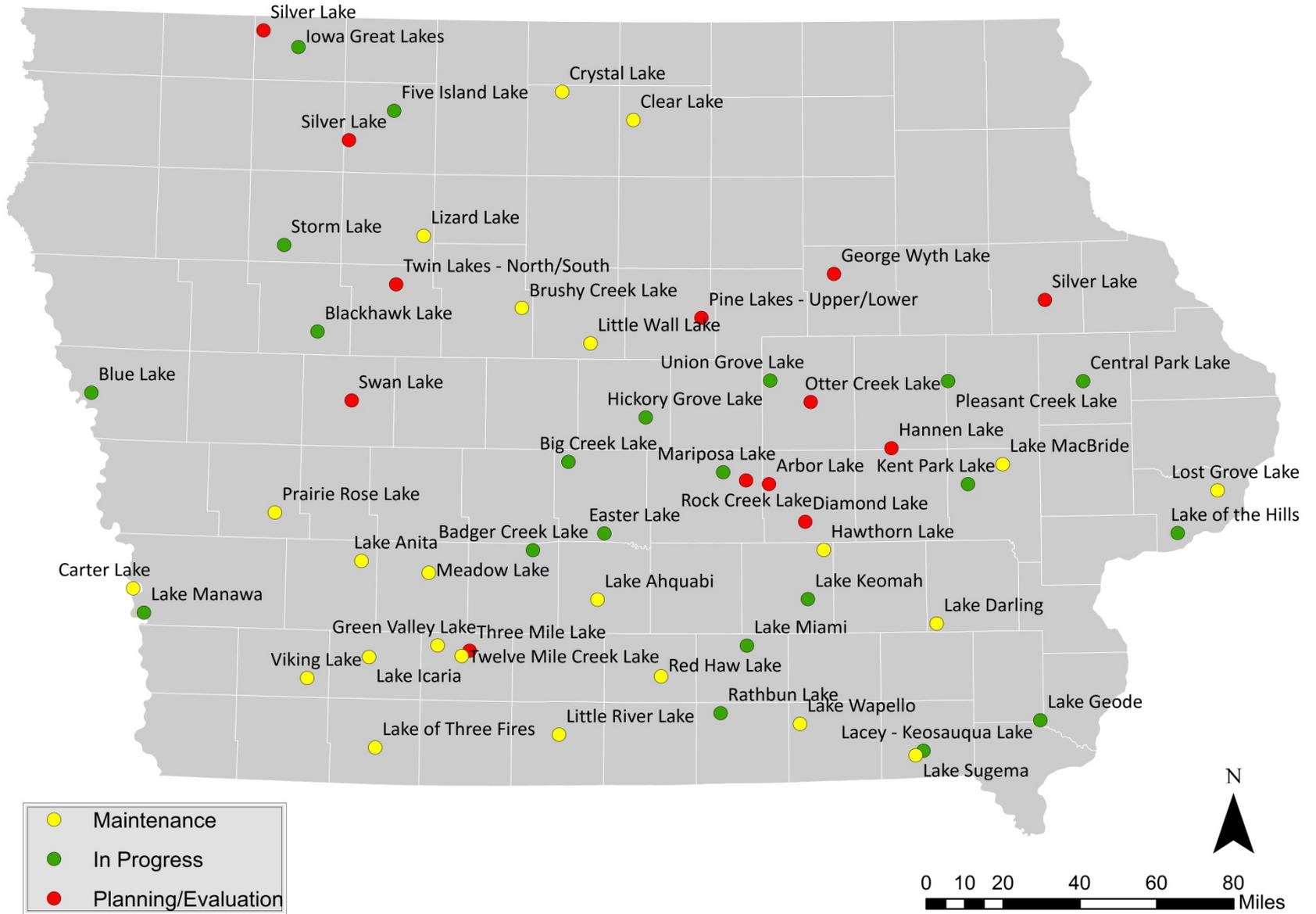
Program Priority Watersheds



Iowans love their lakes, and they are an important part of the State's Economy

- 6 of 10 Iowans visit our lakes multiple times with a given year
- Statewide, lakes generate \$1.2 billion in annual spending by Iowans
- Iowans are willing to drive farther for lakes with better water quality and more amenities
- Lake Restoration activities work to provide diverse recreational opportunities and improved water quality for future Iowa generations





Lake Prioritization , Planning, and Implementation Process

← Planning Process →

Initial Planning:

- Diagnostic and Feasibility Studies
- Initial engineering/ project cost estimates
- Identifying project partners and additional funding sources

Final Planning:

- Develop comprehensive watershed and in-lake restoration plan
- Additional design work completed
- Develop education and outreach plan
- Continue to work with project partners to identify cost share opportunities

← Implementation Process →

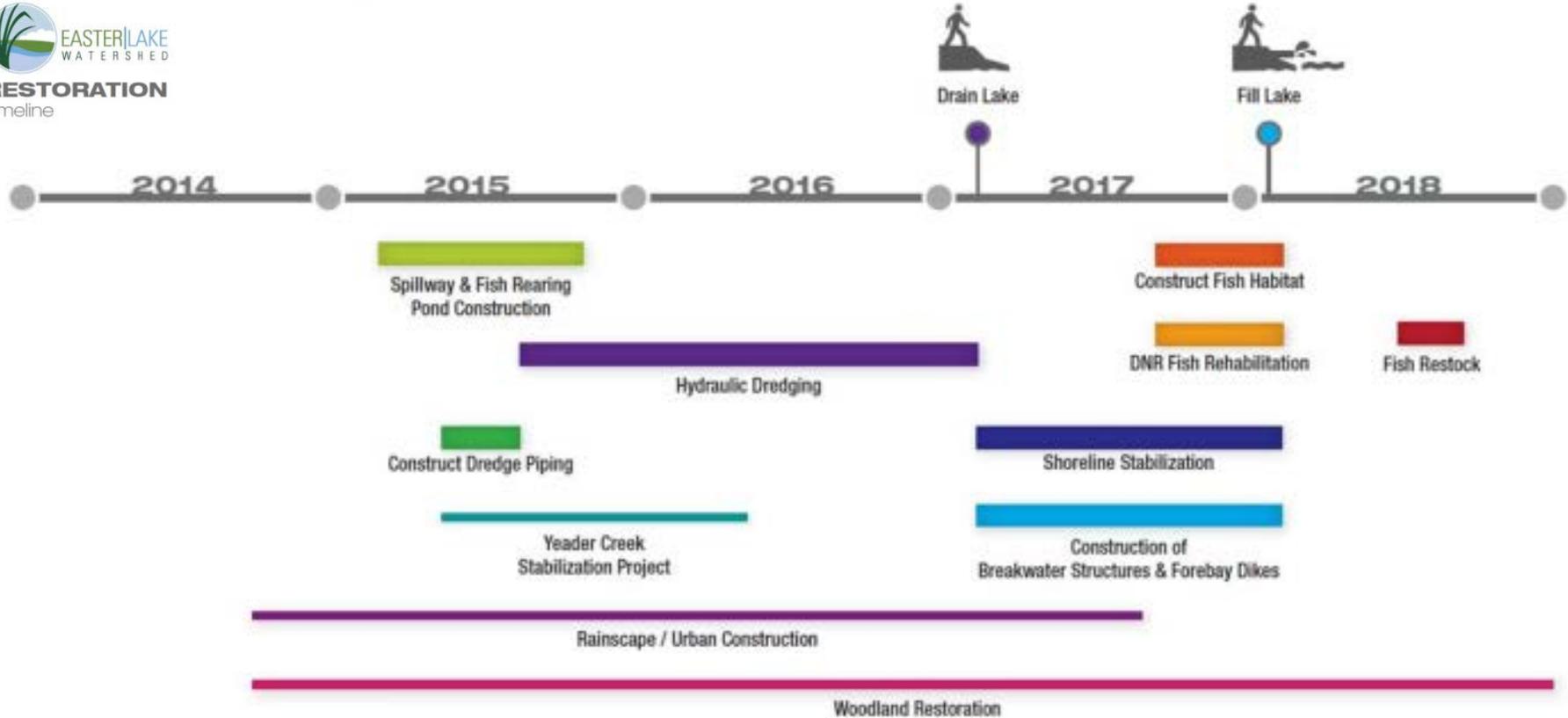
Watershed Implementation:

- Final engineering design for watershed projects
- Work with project partners to treat watershed before in-lake work begins
- Construct BMPs on public and private land in the watershed
- Examples include: terraces, ponds, and forest restoration
- Continue education and outreach with the community

In-lake Implementation:

- Final engineering design and permitting for in-lake projects
- Complete in-lake work as watershed projects wrap-up
- Examples of in-lake work include: shoreline armoring, dam repair, and dredging
- Continue to work with project partners to educate and interact with the community

How the Process Translates to a Project



2015 Major Accomplishments

Lake Name:	2015 Expenditures:	Work Completed:
Prairie Rose Lake	\$1.5 M	Lake/watershed restoration work
IA Great Lakes	\$587 K	Wetland restoration (Marble/Hottes)
Twelve Mile Lake	\$297 K	Wetland/marsh restoration
Big Creek Lake	\$226 K	Watershed restoration projects
Blue Lake	\$199 K	Fish barrier/water control structures
Black Hawk Lake	\$316 K	In-lake management
Storm Lake	\$313 K	In-lake dredging
Lake Manawa	\$450 K	Engineering design, containment site
Easter Lake	\$369 K	Engineering design, containment site

- Total expenditures listed above account for 70% of expenditures
- Additional accomplishments include watershed improvements, shoreline work and other in-lake improvements, and diagnostic/feasibility studies and other planning efforts at over 15 lakes

2015 Major Projects: Prairie Rose Lake (Shelby)

- **Watershed Work Leads the Way** – A 2008 watershed project led the way by reducing nutrient and sediment delivery to Prairie Rose Lake.
- **From Green as Grass to Blue as the Sky** – Water quality improved dramatically following in-lake restoration efforts completed over the past 3 years.
- **Excellent Angling Opportunities**– Restocking began in April of 2013, and fishing activity has increased dramatically in 2015.
- **Comprehensive Restoration** – This \$4 M project included everything from watershed work to in-lake dredging to restore and preserve the lake for generations to come.
- **Positive Feedback** – Visitors to the lake report excellent fishing and new opportunities because of restoration efforts.

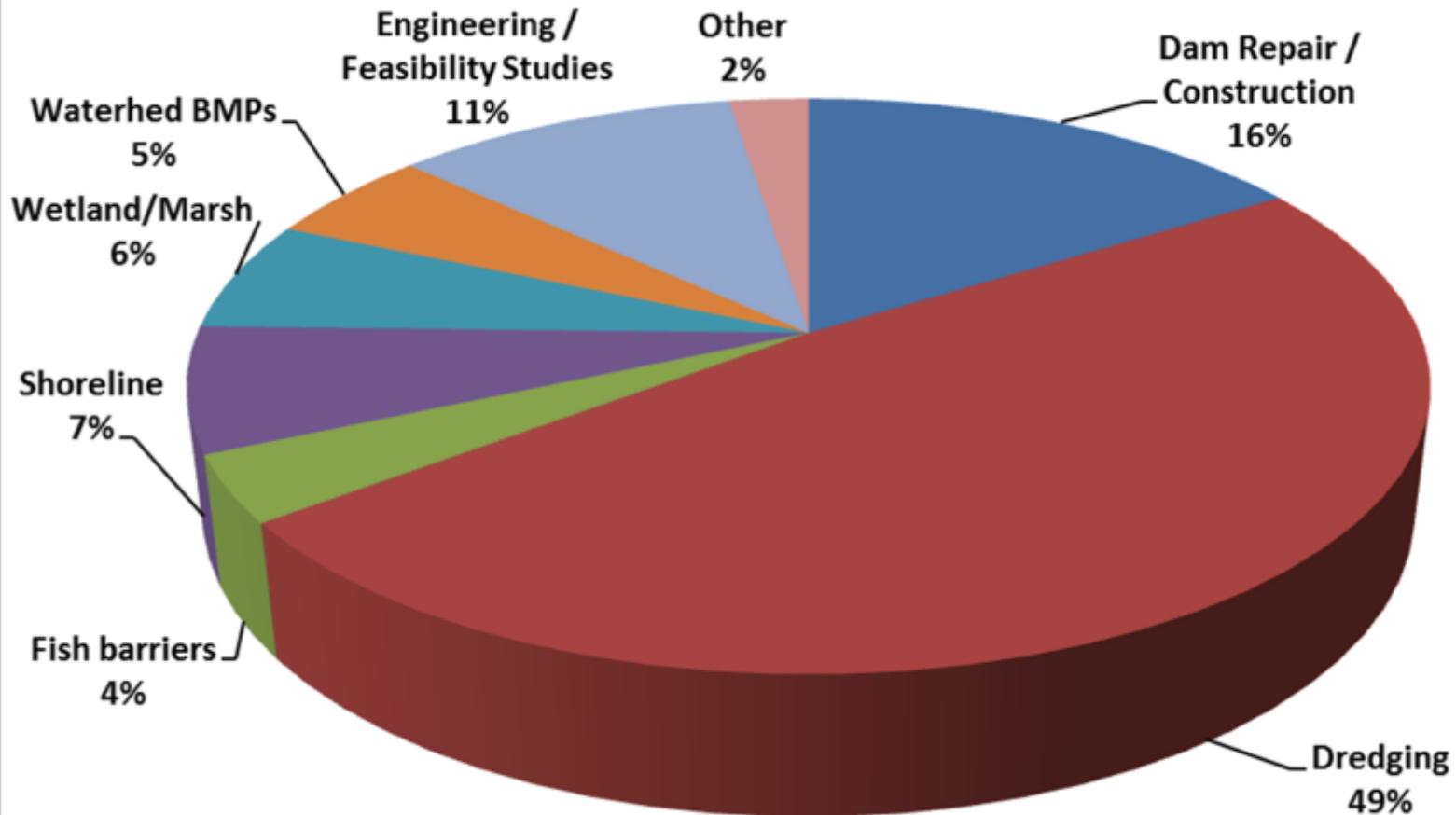


2015 Major Projects: Iowa Great Lakes (Dickinson)



- **Major Restoration Work at Marble/Hottes Complex** – Restoration of these shallow lakes will improve water quality and provide excellent wildlife habitat
- **Watershed Conservation Practices Help Protect the Great Lakes** – Extensive watershed work continues throughout the Great Lakes in both urban and rural settings to protect these important resources
- **Project Partnerships Lead to Success** – The LRP has partnered with a variety of organizations, investing over \$1 Million dollars since 2010 (a 34% cost share of the nearly \$3.1 million dollars spent).
- **Rock Barriers at Center Lake Limit Rough Fish** – Barriers constructed will prevent carp from entering wetlands adjacent to the lake (where carp typically spawn), thus limiting the carp population in the Great Lakes.

Lakes Program Historic Spending by Category



2016 Plan

Major Projects in 2016 Include:

- **Lake Manawa** – Dredging
- **Easter Lake** – Yeader Creek Stabilization, Shoreline work
- **Black Hawk Lake** – Inlet marsh restoration
- **Center Lake** – Shoreline work and wetland enhancement
- **Pleasant Creek Lake** – Shoreline deepening and armoring, public access improvement
- **Union Grove Lake** – Shoreline, dredging and outlet structure repair
- **Kent Park Lake** – Watershed work



5-yr Capital Plan and Beyond

- Projects in progress at 21 lakes around the state
- 5-yr Capital plan assumes consistent funding at \$9.6 million dollars per SFY for SFY17-SFY-21

Project Name	County	Description	Timeline
Center L.	Dickinson	Shoreline, fish barrier, wetland	FY17
Five Island L.	Palo Alto	Sediment study, carp control	FY17
Lake Miami	Monroe	Watershed ponds	FY17
Mariposa L.	Jasper	Shoreline, dredging, spillway repair	FY17
Pleasant Creek L.	Linn	Shoreline protection	FY17
Three Mile Lake	Union	Shoreline, wetland, ponds, fish renovation	FY17
Union Grove L.	Tama	Gate-valve, fish barrier, shoreline, dredging	FY17
Black Hawk L.	Sac	Containment site, watershed, dredging	FY17-FY21
Blue L.	Monona	Watershed, containment site, in-lake	FY17-FY21
Central Park L.	Jones	In-lake restoration	FY17-FY21
Easter L.	Polk	Watershed Phase 2 and 3, in-lake	FY17-FY21
Hickory Grove L.	Story	Watershed, shoreline, in-lake restoration	FY17-FY21
IA Great Lakes	Dickinson	Watershed improvement, water quality projects	FY17-FY21
Kent Park L.	Johnson	Watershed improvement	FY17-FY21
Lacey Keosauqua L.	Van Buren	Watershed BMPs, in-lake planning	FY17-FY21
Lake Geode	Henry	Sediment ponds, in-lake restoration	FY17-FY21
Lake Keomah	Mahaska	Watershed BMPs, in-lake planning	FY17-FY21
Lake Manawa	Pottawattamie	Mosquito and Indian Creeks, dredging	FY17-FY21
Lake of the Hills	Scott	Watershed assessment	FY17-FY21
Rathbun Reservoir	Appanoose	Watershed, 1135 Project Shoreline	FY17-FY21
Storm Lake	Buena Vista	Dredging, island stabilization, in-lake	FY17-FY21
Lake Assessment		Lake Assessment	On-going
Minors		Minors	On-going
Proj. Mgmt./Eng.		Project management and engineering services	On-going
Shallow Lakes		Rice Lake, Little Swan Lake, Elm Lake	On-going

For More Information...

www.iowadnr.gov/Fishing/About-Fishing-in-Iowa/Lake-Restoration-Program



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Appendix

Lake Restoration Program Five Year Capital Plan

Project Name	County	LRP FY17	LRP FY18	LRP FY19	LRP FY20	LRP FY21	Total	Description
Center L.	Dickinson	\$100,000					\$100,000	Shoreline, fish barrier, wetland
Five Island L.	Palo Alto	\$125,000					\$125,000	Sediment study, carp control
Lake Miami	Monroe	\$100,000					\$100,000	Watershed ponds
Mariposa L.	Jasper	\$150,000					\$150,000	Shoreline, dredging, spillway repair
Pleasant Creek L.	Linn	\$175,000					\$175,000	Shoreline protection
Three Mile Lake	Union	\$300,000					\$300,000	Shoreline, wetland, ponds, fish renovation
Union Grove L.	Tama	\$225,000					\$225,000	Gate-valve, fish barrier, shoreline, dredging
Black Hawk L.	Sac	\$1,450,000	\$2,250,000	\$2,300,000	\$2,450,000	\$2,550,000	\$11,000,000	Containment site, watershed, dredging
Blue L.	Monona	\$250,000	\$750,000	\$750,000	\$750,000	\$750,000	\$3,250,000	Watershed, containment site, in-lake
Central Park L.	Jones	\$180,000	\$180,000	\$180,000	\$180,000	\$180,000	\$900,000	In-lake restoration
Easter L.	Polk	\$600,000	\$600,000	\$600,000	\$600,000	\$600,000	\$3,000,000	Watershed Phase 2 and 3, in-lake
Hickory Grove L.	Story	\$400,000	\$250,000	\$250,000	\$250,000	\$250,000	\$1,400,000	Watershed, shoreline, in-lake restoration
IA Great Lakes	Dickinson	\$750,000	\$750,000	\$750,000	\$750,000	\$750,000	\$3,750,000	Watershed improvement, water quality projects
Kent Park L.	Johnson	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$1,500,000	Watershed improvement
Lacey Keosauqua L.	Van Buren	\$100,000	\$250,000	\$250,000	\$250,000	\$250,000	\$1,100,000	Watershed BMPs, in-lake planning
Lake Geode	Henry	\$425,000	\$425,000	\$425,000	\$425,000	\$425,000	\$2,125,000	Sediment ponds, in-lake restoration
Lake Keomah	Mahaska	\$320,000	\$320,000	\$320,000	\$320,000	\$320,000	\$1,600,000	Watershed BMPs, in-lake planning
Lake Manawa	Pottawattamie	\$1,600,000	\$1,600,000	\$1,600,000	\$1,600,000	\$1,600,000	\$8,000,000	Mosquito and Indian Creeks, dredging
Lake of the Hills	Scott	\$100,000	\$225,000	\$225,000	\$225,000	\$225,000	\$1,000,000	Watershed assessment
Rathbun Reservoir	Appanoose	\$300,000	\$350,000	\$350,000	\$350,000	\$350,000	\$1,700,000	Watershed, 1135 Project Shoreline
Storm Lake	Buena Vista	\$800,000	\$500,000	\$450,000	\$300,000	\$200,000	\$2,250,000	Dredging, island stabilization, in-lake
Lake Assessment		\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$500,000	Lake Assessment
Minors		\$150,000	\$150,000	\$150,000	\$150,000	\$150,000	\$750,000	Minors
Proj. Mgmt./Eng.		\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$2,500,000	Project management and engineering services
Shallow Lakes		\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$500,000	Rice Lake, Little Swan Lake, Elm Lake
		\$9,600,000	\$9,600,000	\$9,600,000	\$9,600,000	\$9,600,000	\$48,000,000	

Lake Restoration Program Long Term Planning Budget

		Long Term Planning Budget					
Project Name	County	LRP FY22	LRP FY23	LRP FY24	LRP FY25	LRP FY26	Total
Blue L.	Monona	\$750,000					\$750,000
Black Hawk L.	Sac	\$1,370,000	\$1,320,000				\$2,690,000
Arbor L.	Poweshiek	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000	\$750,000
Badger Creek L.	Madison	\$1,200,000	\$1,200,000	\$1,570,000	\$1,450,000	\$1,550,000	\$6,970,000
Big Creek L.	Polk	\$300,000	\$1,100,000	\$1,175,000	\$1,100,000	\$775,000	\$4,450,000
Diamond L.	Poweshiek	\$150,000	\$150,000	\$200,000	\$190,000	\$200,000	\$890,000
George Wyth L.	Black Hawk	\$150,000	\$150,000	\$200,000	\$190,000	\$200,000	\$890,000
Hannen L.	Benton	\$175,000	\$175,000	\$175,000	\$175,000	\$175,000	\$875,000
IA Great Lakes	Dickinson	\$750,000	\$750,000	\$750,000	\$750,000	\$750,000	\$3,750,000
Otter Creek Lake	Tama	\$240,000	\$240,000	\$310,000	\$290,000	\$310,000	\$1,390,000
Pine L._Upper/Lower	Hardin	\$190,000	\$190,000	\$250,000	\$230,000	\$250,000	\$1,110,000
Rathbun Reservoir	Appanoose	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$1,250,000
Rock Creek L.	Jasper	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$5,000,000
Silver Lake	Delaware	\$175,000	\$175,000	\$230,000	\$220,000	\$230,000	\$1,030,000
Silver Lake	Dickinson	\$250,000	\$250,000	\$325,000	\$730,000	\$775,000	\$2,330,000
Silver Lake	Palo Alto	\$375,000	\$375,000	\$495,000	\$465,000	\$485,000	\$2,195,000
Swan Lake	Carroll	\$200,000	\$200,000	\$260,000	\$250,000	\$260,000	\$1,170,000
Three Mile Lake	Union	\$575,000	\$575,000	\$750,000	\$700,000	\$740,000	\$3,340,000
Twin L._North/South	Calhoun	\$500,000	\$500,000	\$660,000	\$610,000	\$650,000	\$2,920,000
Lake Assessment		\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$500,000
Minors		\$150,000	\$150,000	\$150,000	\$150,000	\$150,000	\$750,000
Proj. Mgmt./Eng.		\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$2,500,000
Shallow Lakes		\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$500,000
		\$9,600,000	\$9,600,000	\$9,600,000	\$9,600,000	\$9,600,000	\$48,000,000

Highlighted Success Stories: Blue Lake (Monona)



- **Innovative Solutions** – New fish barrier/water control structures at Blue Lake will prevent rough fish from entering the lake while allowing water to pass through (first of their kind in the State of Iowa). These solutions will help should the fishery be renovated at the lake.
- **Local Stakeholder Involvement** – Local land owners meet DNR and other project partners regularly to determine the best path forward for Blue Lake.
- **Investing in Our State Parks** – Lewis and Clark State Park draws in thousands of visitors annually to enjoy the Blue Lake Beach, visit the Keel Boat, and discover more about that natural world in the learning center.

Highlighted Success Stories: Easter Lake (Polk)

- **Partnerships in Action** – Multiple agencies are working together for water quality; LRP funding about 50% of this \$18 million dollar project.
- **Watershed Success** – Addressing storm water and nutrient loading in an urban environment
- **Providing New Opportunities** – new multi-use trail around the lake, additional lake amenities, and shoreline improvements are projected to dramatically increase lake visitation.
- **In-lake Restoration** – Dredging and shoreline armoring with improve water quality and increase the lifespan of the lake

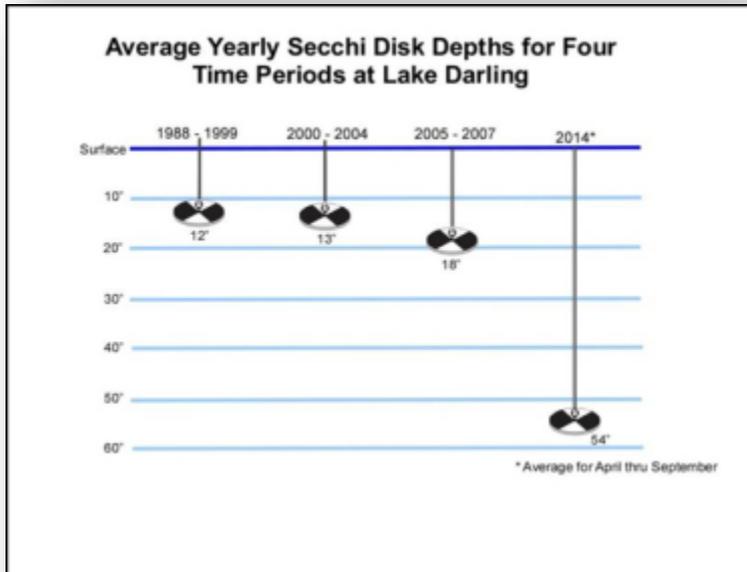


Volunteers from the community help with forest restoration activities around Easter Lake Park

Highlighted Success Stories: Lake Darling (Washington)

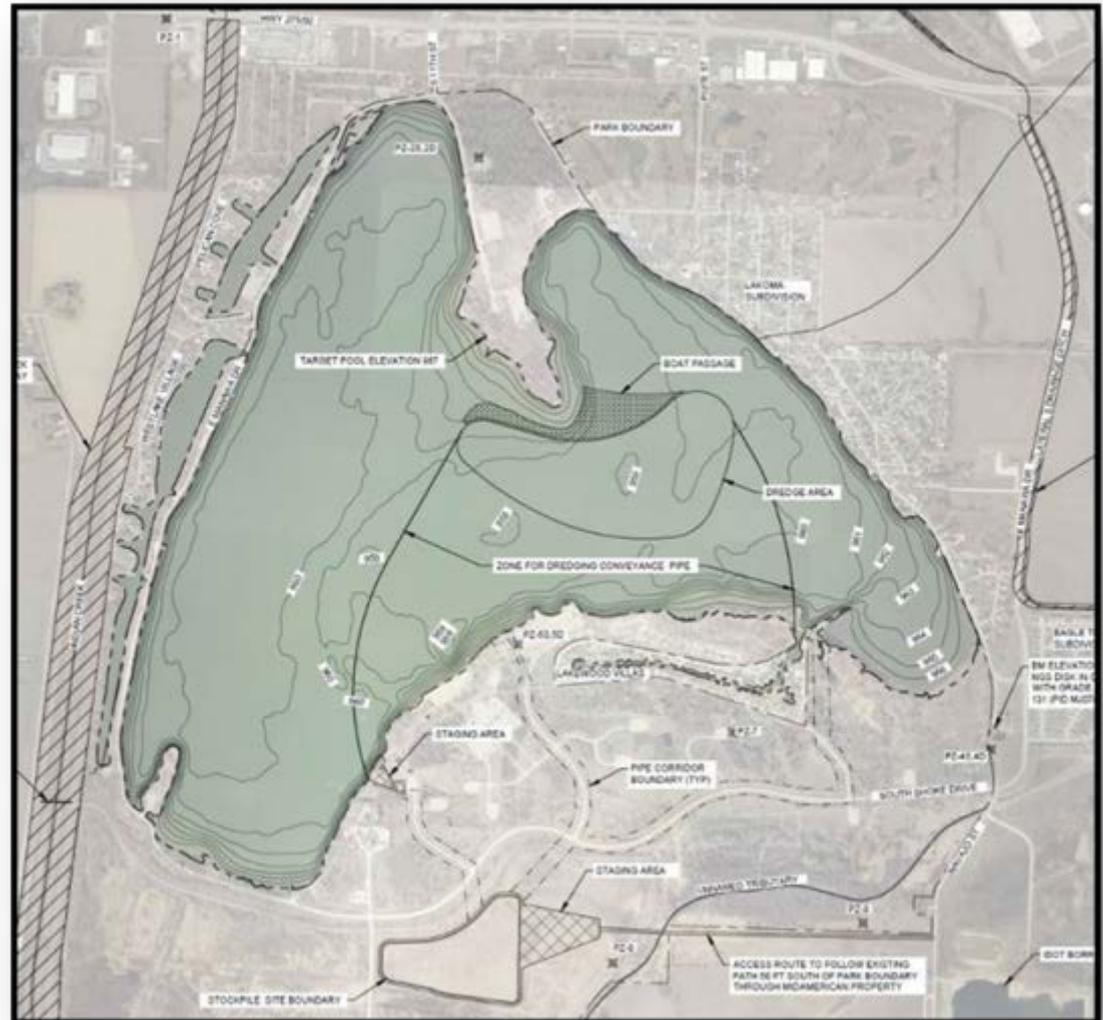


- **Long-term Planning for Success** – This \$13 million dollar project spanned over 5 years, and resulted in extensive improvements throughout the park. The LRP invested \$7 million in this project.
- **Watershed and In-lake Work Yields Water Quality Improvement**– Water clarity more than doubled due to extensive work throughout the watershed and in-lake dredging, installation of a new outlet structure, and shoreline improvements along the lake.
- **Lake Restoration Leads the Way** – Following the in-lake restoration, the park has constructed numerous other park improvements, including 4-season cabins, new bathroom facilities, and interpretive signs and trails.



Lake Manawa (Pottawattamie)

- Dredging planned for 2016 to deepen this oxbow lake for water quality improvement
- 500,000 CY is planned to be removed by Contractor J.F. Brennon Co. beginning in March
- DNR continues to meet with project partners, such as the “Friends of Lake Manawa” to solicit support for the project.



Highlighted Success Stories: Lost Grove Lake (Scott)



- **Creating New Opportunities** – This 20+ year project resulted in a new 400 acre lake near the Quad-Cities
- **Clear Waters Ahead** – Water quality at Lost Grove Lake is among the best in the State, and the fishery at the lake is rapidly growing to provide new opportunities for anglers. The lake also provides flood protection and soil conservation benefits.
- **Long-Term Economic Growth** – An investment in Iowa's infrastructure; this lake serves over 400,000 local residents and is predicted to draw many new outdoor enthusiasts to the area.



Pleasant Creek Lake (Linn)

- Lake is partially drawn down in preparation for 2016 work. 2015 work included the replacement of stop log structure at the lake.
- Shoreline armoring and deepening will protect the lake from shoreline erosion and provide new opportunities for anglers.
- In-lake work is currently budgeted at ~\$2.5 million dollars. Project partners include the US Coast Guard, the Marine Fuel Tax Fund, and the Sport Fish Restoration Fund
- Additional improvements include fishing jetties, fish habitat, and boat ramp replacements

