Marshes for Tomorrow –

A Strategic Plan for the Restoration and Resiliency of Maryland's tidal marshes

ARWG: NOVEMBER 20, 2024

DAVID CURSON, AUDUBON MID-ATLANTIC

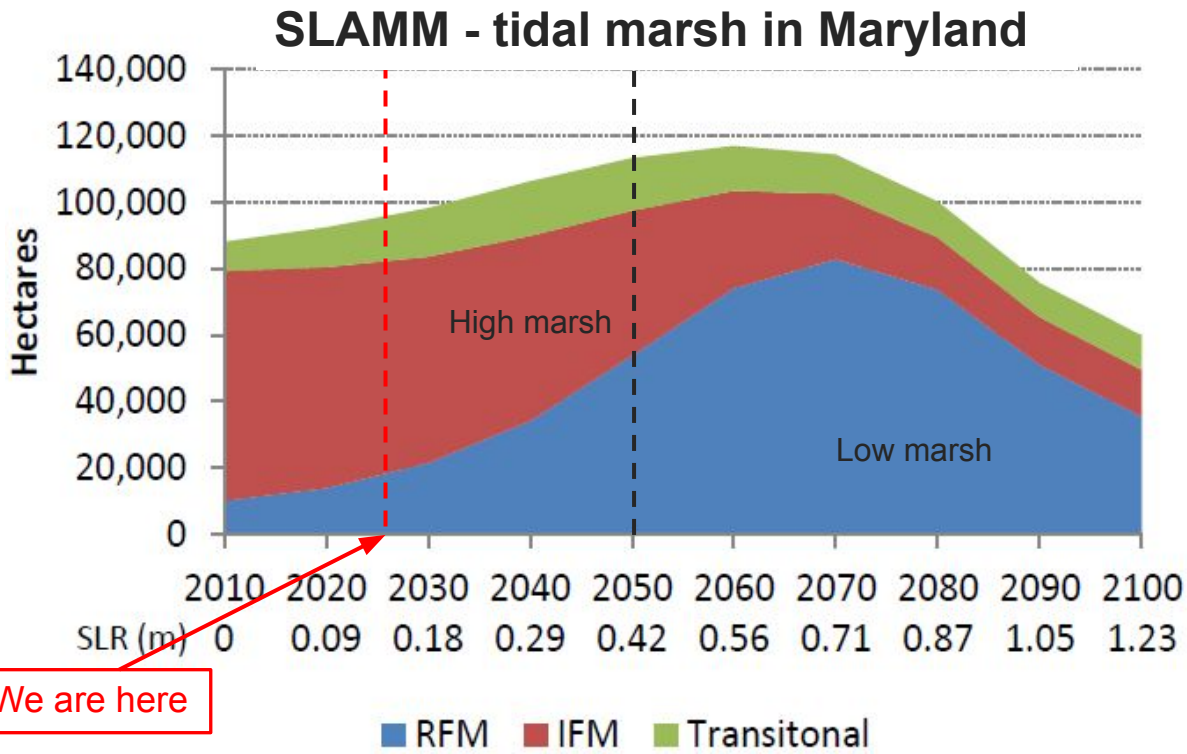
Audubon | MID-ATLANTIC

Public Landing boat ramp, Worcester County. Credit: Hailey Glasko

High marsh zone in MD declines >33% by 2050 - converts to low marsh

but….

SLAMM underestimates marsh erosion



"Upper limit of likely range" SLR scenario, 2010–2100 = +1.23 meters (TNC, 2021).

Marsh restoration methods – need scaling up rapidly!

1. Marsh high enough to drain:
   runnels (small hand-dug channels).
   Cost: $1000/acre

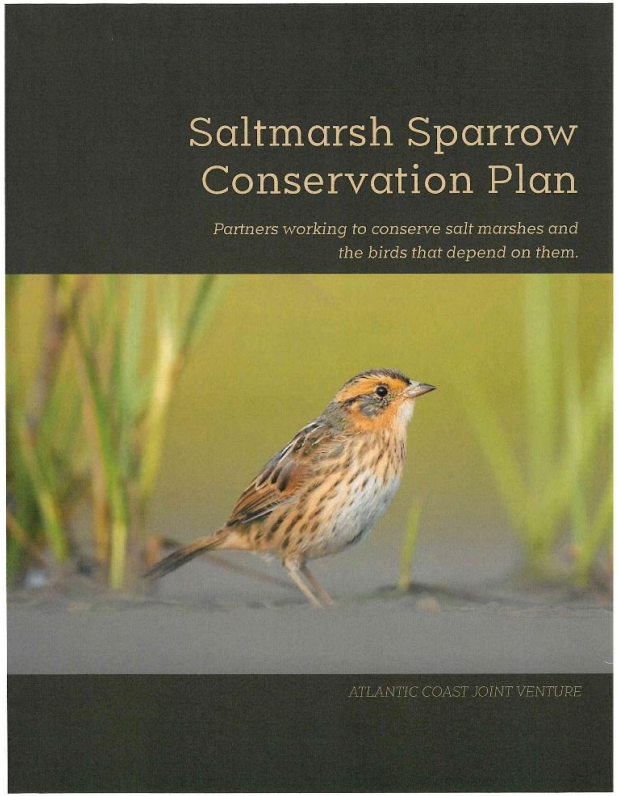
Runneling project: Coastal Bays (2023)

2. Marsh too low to drain:
   Add sediment to raise the marsh surface.
   Cost: >$20,000/acre

Sediment enhancement: Blackwater NWR (2016)

Atlantic Coast Joint Venture Saltmarsh Sparrow Conservation Plan

Saltmarsh Sparrow: A conservation umbrella for the entire high marsh ecosystem



- SALS nests only in high marsh, the most vulnerable marsh zone to SLR.
- Extinction possible by mid 21st Century, due to SLR and marsh loss.

State	% of global pop'n	Pop'n goal (indivs)	Minimum habitat goal (acres)
Delaware	6.8%	1,711	2,838 ac
Maryland	25.2%	6,302	24,783 ac
Virginia	7%	1,753	13,517 ac

Marshes for Tomorrow: A project of the DRCN

Goal: Create an implementation plan for tidal marsh restoration on a landscape scale in Maryland.

Objective 1

Marsh prioritization

Identify at least 25,000 acres of tidal marsh to be maintained long term to conserve the high marsh ecosystem and Saltmarsh Sparrow in Maryland in the face of sea level rise.

Objective 2

Restoration strategy

Determine a schedule of restoration projects to maintain this acreage as high marsh over the long term.

Objective 3

Community input

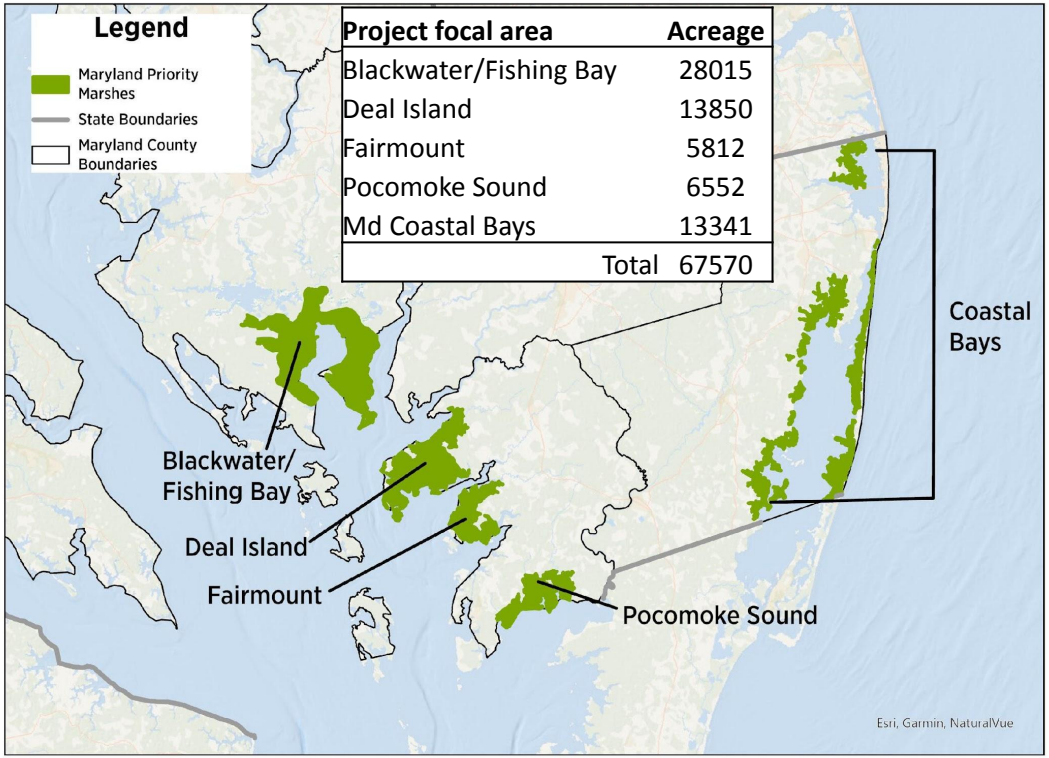
Create conceptual conservation strategies at the local/county level, which have the broad approval of local communities

Funding: USFWS: $1.7 million (inc. implementation)
NFWF: $416,000

DELMARVA RESTORATION & CONSERVATION NETWORK

MfT project focal areas

Maryland Priority Marshes for Saltmarsh Sparrow



Map prepared by Audubon Mid-Atlantic in collaboration with ACJV and bird conservation experts

N

0 5 10 20 Kilometers

0 5 10 20 Miles

Thank you to our **Partners** and **Funders**

Audubon

Funding provided by:

USFWS Partners for Fish & Wildlife Program (via Chesapeake Bay Field Office)

NFWF National Coastal Resilience Fund

DELMARVA RESTORATION & CONSERVATION NETWORK

LOWER SHORE LAND TRUST

The Besterman Coastal Ecology Lab
Dept. Biological Sciences | Towson University

GEDAN LAB @ GWU

Atlantic Coast JOINT VENTURE

EASTERN SHORE LAND CONSERVANCY

Beaches, Bays & Water Ways

University of Maryland CENTER FOR ENVIRONMENTAL SCIENCE

Sustainable Science

MARYLAND DEPARTMENT OF NATURAL RESOURCES

THE CONSERVATION FUND

MARYLAND COASTAL BAYS PROGRAM

VIMS | WILLIAM & MARY
VIRGINIA INSTITUTE OF MARINE SCIENCE

USGS
science for a changing world

The Nature Conservancy

Chesapeake Bay Trust
Empowering people. Restoring nature.

Saltmarsh Habitat & Avian Research Program
SHARP

Marshes for Tomorrow Process 2023-24

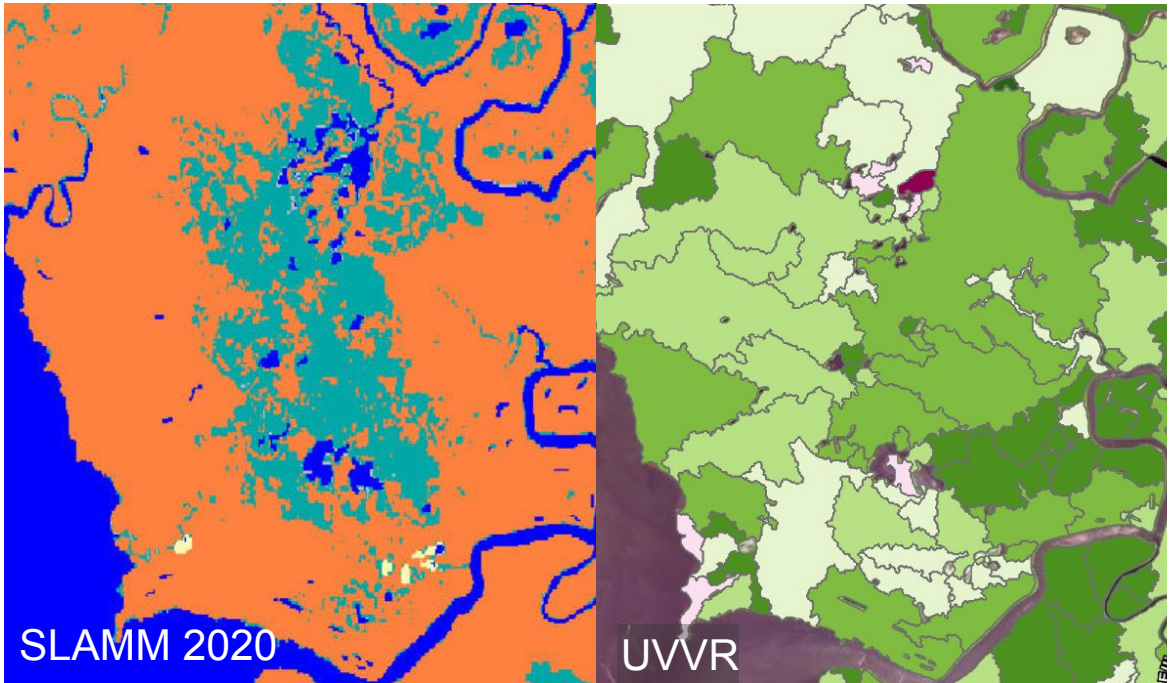
Working Group	Role
Project Advisory Team	Steer & advise project
Core Analysis Team	Create, review, spatial models
Technical Workshops	Create draft marsh prioritizations
Community Engagement Team	Marsh use survey, community meetings
Focus Groups	Finalize Priority Marsh Areas and restoration strategies


How did we identify our target 25,000 acres?
Sydney Walsh/National Audubon Society

Marsh Condition Model

Includes marsh health (**UVVR**) and future resilience to SLR (elevation, from **SLAMM**).

- Analysis Conducted for all Marsh Units in the Chesapeake and Coastal Bays
- Marsh Unit – small scale drainage systems within a Marsh
- USGS Coastal Wetland Synthesis
- Landscape Scale Approach



Fishing Bay/Island Creek Marsh Condition 2020

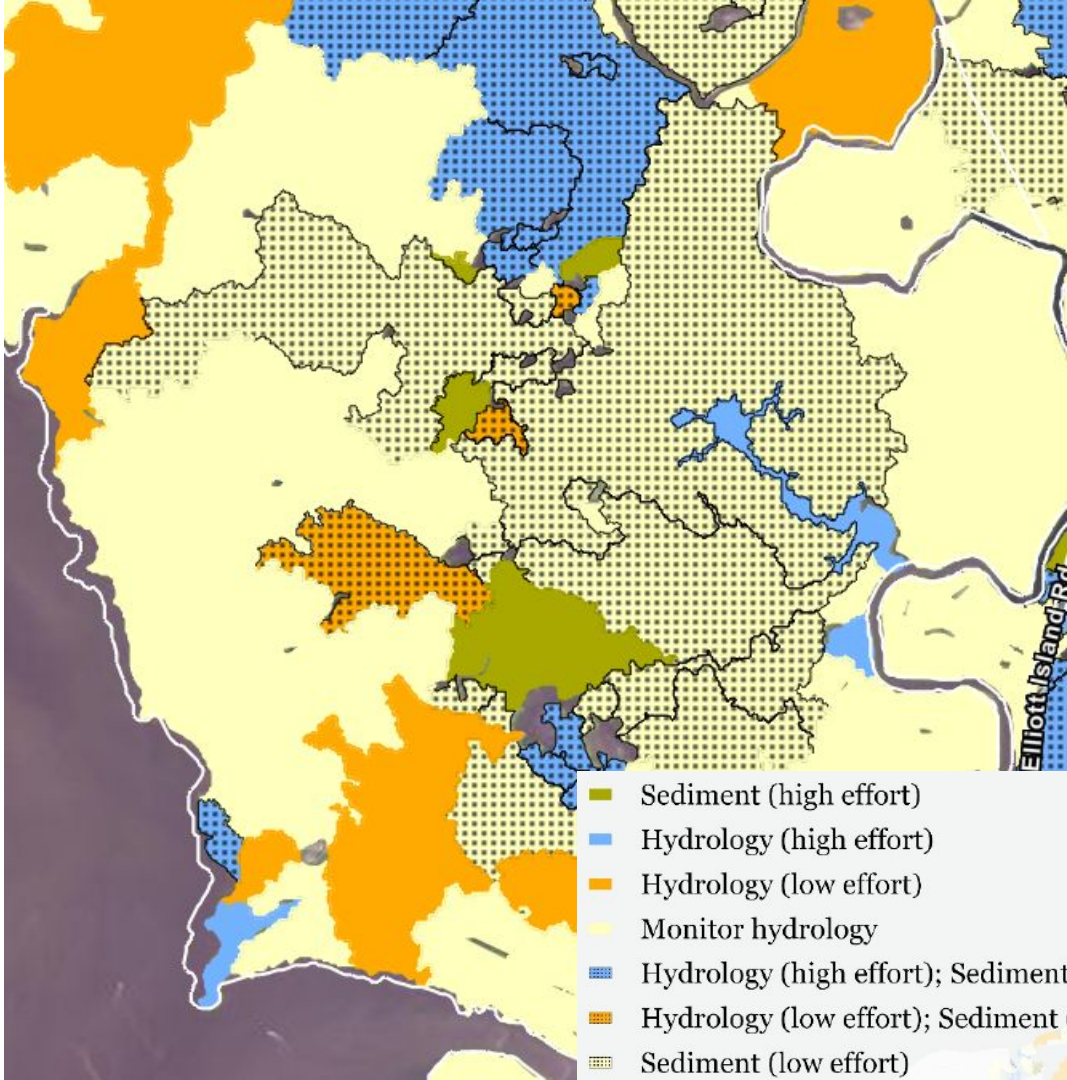
	Marsh Condition – Elevation (SLAMM) + marsh health
	Class 4 “Worst”
	Class 3
	Class 2
	Class 1 “Best”

Restoration Decision Model

Based on UVVR and SLAMM

Designated outcomes for

- Hydrological repair (runnels, other)
- Sediment placement



Marsh Prioritization Model

Top-ranked criteria were weighted and combined into single prioritization model

Marsh Condition
45 pts

+

Vegetation type
30 pts

+

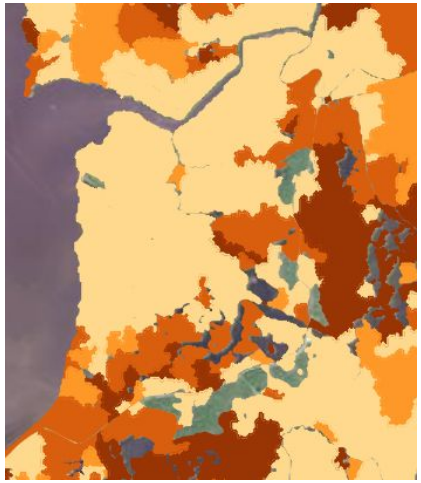
Migration corridors
12.5 pts

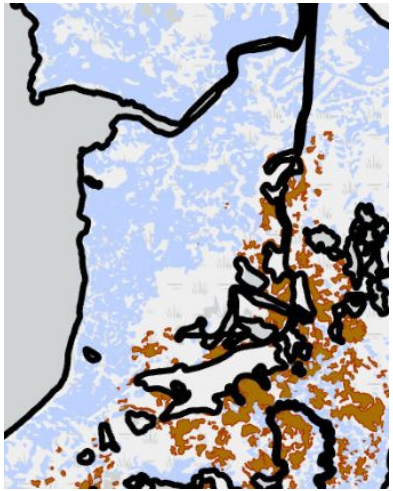
+

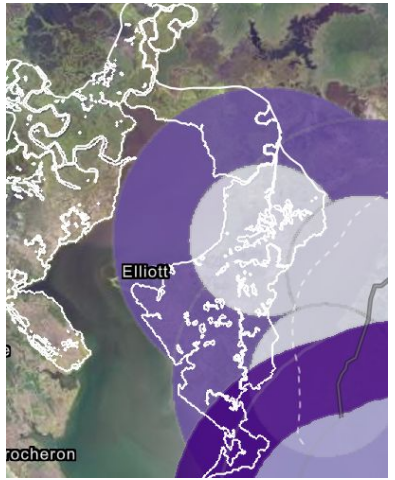
Dredging buffers and navigation channels
12.5 pts

=

Total
100 pts



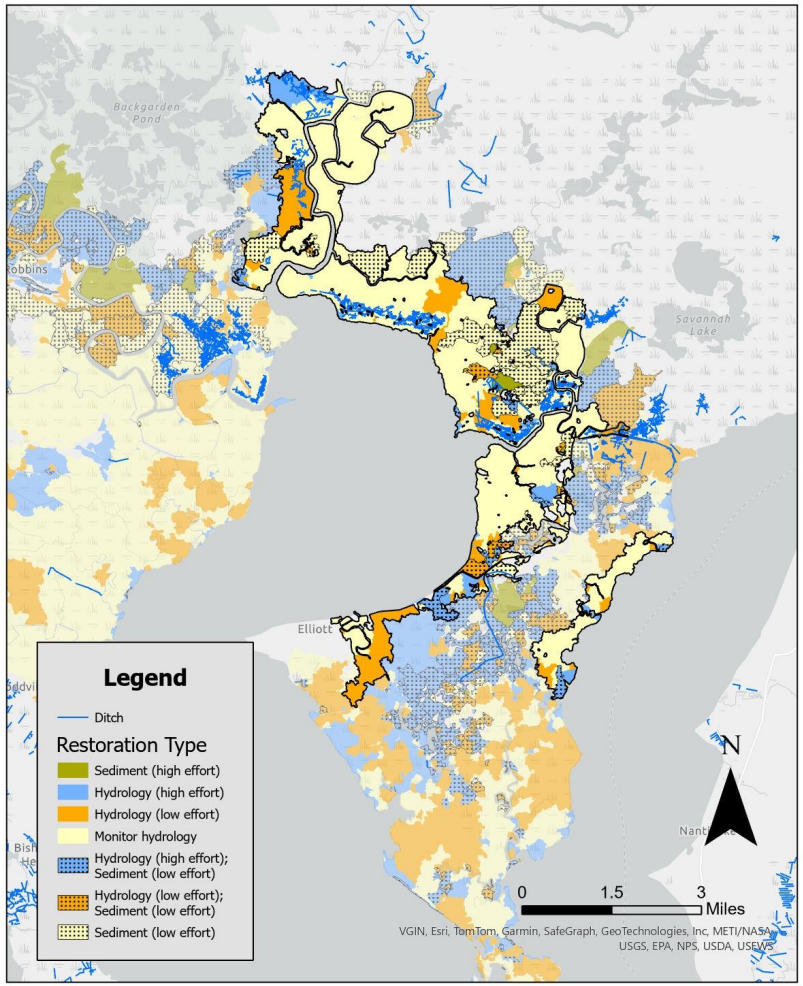




Marsh Prioritization - additional criteria (visual overlays)

Marsh Prioritization criteria	Data Layer	Included as
Land ownership	Land ownership	Visual overlay map
Saltmarsh Sparrow abundance	SHARP abundance 2021-2022	Visual overlay map
Community feedback and infrastructure	Community identified features and community infrastructure	Visual overlay map
Landowners enthusiastic about restoration; conserved lands	Protected lands	Visual overlay map
Large contiguous marsh blocks	No specific data layer	Visual assessment of maps

Fishing Bay East and Nanticoke PMAs 2020 Restoration Model



Audubon

Marshes for Tomorrow Plan products

1. Map of Priority Marsh Areas (approx. 29,000 acres)
2. Spatially explicit restoration recommendations.
3. Estimated acreages for each restoration practice.
4. Priority sequencing within Priority Marsh Areas
5. For landscape-scale planning – need to complete site-level assessment for project plans.

Marshes for Tomorrow GIS Experience Builder

https://experience.arcgis.com/experience/0d1703e972c849bf88acd6cd7026b50c/page/Marshes-for-Tomorrow/

Audubon

Marshes for Tomorrow | Marsh Condition | Restoration Model | Prioritization Model | Sources

Marshes for Tomorrow

A Strategic Plan for the Restoration and Resiliency of Maryland's Tidal Marshes

What does the future hold?

1. Extensive high marsh (historically 80% of tidal marshes) will be effectively gone by 2070.
2. Upslope marsh migration can only replace a small fraction of high marsh lost to SLR.
3. We cannot save all, or even most, of today's marsh, due to high restoration costs.
4. If we act soon with low-tech/low-cost hydrological restoration (runnels, remove tidal restrictions) we can "buy time" and reduce long-term costs.
5. Sediment placement is much more expensive, and will be needed later. Will require novel sources of material and new permitting.

Marshes for Tomorrow - Implementation

- First project in permitting (runneling at Irish Grove Sanctuary, Somerset County, MD)
- Integrate MfT with MD State Wetlands Adaptation Strategy (2025)
- Apply MfT spatial models to Chesapeake Bay Trust's Tidal Wetlands Strategic Plan (EPA Wetlands Capacity Building)

Next Steps - implementation

- December: Partner review of full MfT draft report.
- Winter 2025: Meet private landowners to set up additional restoration projects
- Summer 2025: Collect baseline data on Irish Grove project.
- 2025…….: Implement restoration projects on public and private lands.