



Carbon, Climate, and Natural Lands

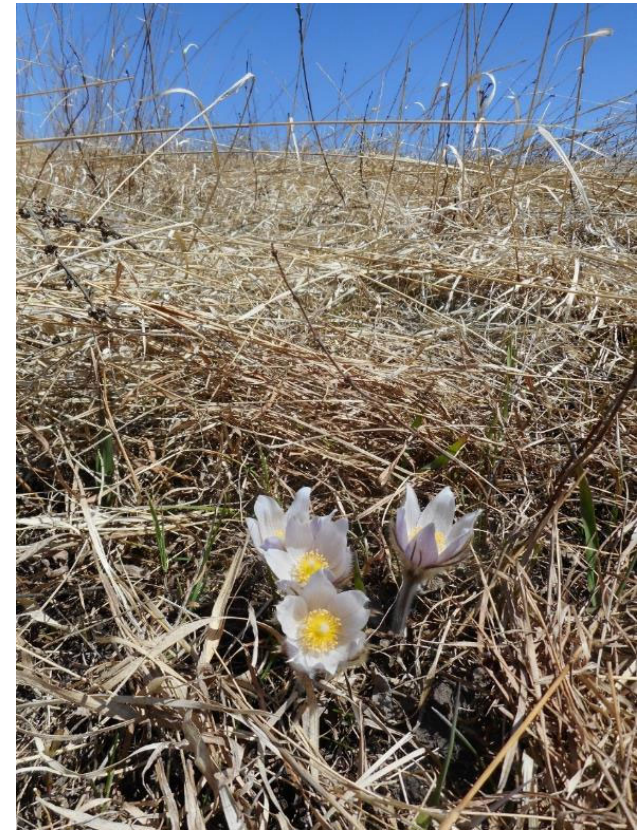
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Two parts – Carbon and Consequences

- Natural Lands and carbon capture / sequestration
- Role these lands play in creating a resilient landscape in the context of current and future changes

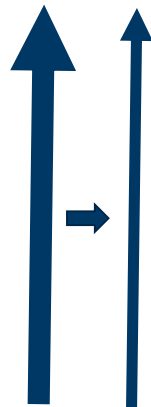


The Carbon Cycle and Habitat Work

Air / Atmosphere

Many climate efforts focus on making this arrow smaller

Putting less carbon into the air



Respiration
Combustion

Photosynthesis



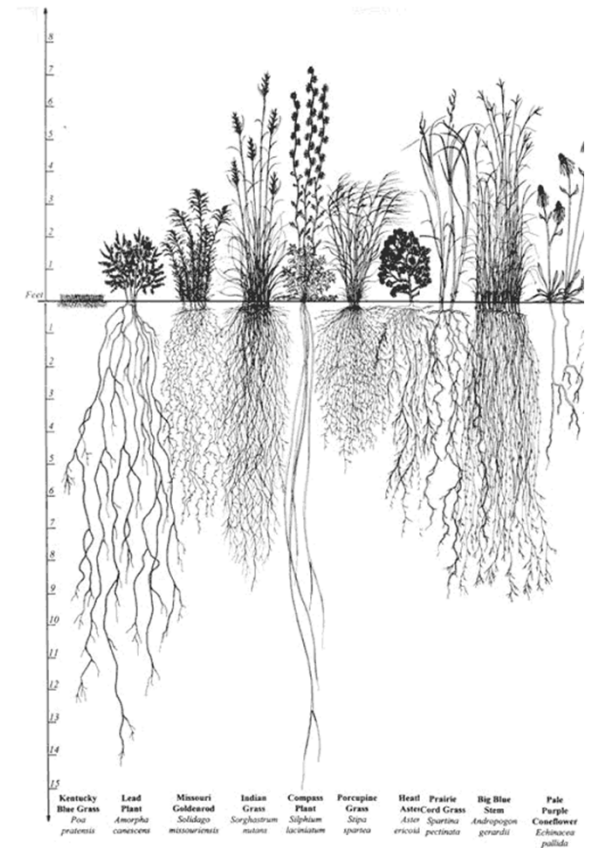
Habitat work focuses on make this arrow larger

Removing more carbon from the air

Soil Vegetation

Habitat Restoration

“Restoration of tallgrass prairie vegetation...has the potential to sequester relatively large amounts of soil organic carbon over a sustained period of time.”
(Matamala et al. 2008)



Root Systems of Prairie Plants

<https://www.fws.gov/news/blog/index.cfm/2011/6/27/Iowa-The-Power-of-Prairies>

- Simple Story

- Grasslands, Forests, Wetlands, and Peatlands can absorb and store large amounts of carbon
 - Protection – keeps carbon in the soils and vegetation
 - Restoration – removes ‘additional’ carbon from the air

- Complex Story

- Grasslands, Forests, Wetlands, and Peatlands provide a host of other benefits for wildlife and people
 - Resilient landscapes
 - Stacked benefits
 - Ecosystem services

Grasslands and wetlands capture water, minimize run-off



Grasslands and wetlands filter water



<https://www.cbc.ca/news/canada/manitoba/lake-winnipeg-algae-july-2019-1.5228183>




Jordan Boat Ramp, Minnesota River, July 2019

Habitat and health

Grassland habitat = healthy drinking water

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Minnesota Drinking Water 2015
Annual Report for 2014
MAY 6, 2015

MDH Minnesota
Department of Health
DRINKING WATER PROTECTION



A coalition of the following groups made the purchase possible: Nobles County Pheasants Forever Chapter and Pheasants Forever's Build a Wildlife Area Fund, E.O. Ohan Trust, Okabena/Okeoka Watershed District, the Minnesota Department of Natural Resources, corporate sponsors, and local residents and businesses. Photo courtesy of Pheasants Forever.

**COMMUNITY AND NONCOMMUNITY WELLS:
AN INTEGRATED APPROACH**

Battle Lake, a community in northern Minnesota, discovered a high nitrate issue through water sampling in noncommunity wells. The impact on the community and surrounding area concerned officials, especially as they discovered additional problems through further sampling. The sampling indicated that groundwater in the vicinity contained significant levels of nitrate. The flow of this groundwater was toward Battle Lake, prompting concerns that it could affect city wells. MDH developed a nitrate monitoring plan for the community. The plan's two components were water quality monitoring and groundwater flow monitoring. The tasks included evaluating nitrate trends, determining if the water quality was a result of human impacts on the environment, and estimating the rate of change in the community and surrounding areas.

Nitrate sampling data have been collected for many years, providing a potentially powerful set of information. The historical data were evaluated within the context of current information to give a clear picture of the nitrate impact in the water. An integrated and coordinated approach was implemented, including the community and noncommunity water sources as well as the broader source water protection area.

Diversity - Pollinators, Wildlife, and Carbon



Two studies from Cedar Creek

“...higher plant diversity leads to greater soil C and N accumulation ... Fornara and Tilman 2008

“...restoration of high plant diversity may greatly increase carbon capture and storage rates...” Yang et al. 2019

We’ve been planting diverse seed mixes for pollinators and wildlife all along. Turns out, what we were doing for them is also the best action we can take for carbon.

OHF efforts to date

	Wetland	Prairie	Forest
Protected Acres	22,775	67,478	254,634
Restored Acres	5,198	13,183	27,466
C Total MT CO2	8,241,007	3,779,645	31,838,406
C Grand Total	43,859,058		
vehicle / yr	9,538,000		



TNC Carbon Calculator
<https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

OHF and the Bigger Picture - Additional Natural Lands Initiative: Walz – Flanagan Budget to Move Minnesota Forward

- **2022 Supplemental Budget
Climate Adaptation and Mitigation**

- \$81.5M in investments for the DNR to reduce carbon in the atmosphere and adapt to current and future climate change impacts

- **\$81.5M partitioned into:**

- \$42M – Climate Adaptation for Natural Lands and Waters
- \$24M – Public land acquisition
- \$10M – Restoring grasslands and wetlands on WMAs for carbon capture and resiliency
- \$5.5M – Forest management assistance to private landowners

Climate Action Framework (CAF)

- Gov Walz Exec Order 19-37
 - Climate Change Subcabinet
 - Climate Change Advisory Council
- Climate Action Framework developed by 15 agencies, departments, and boards

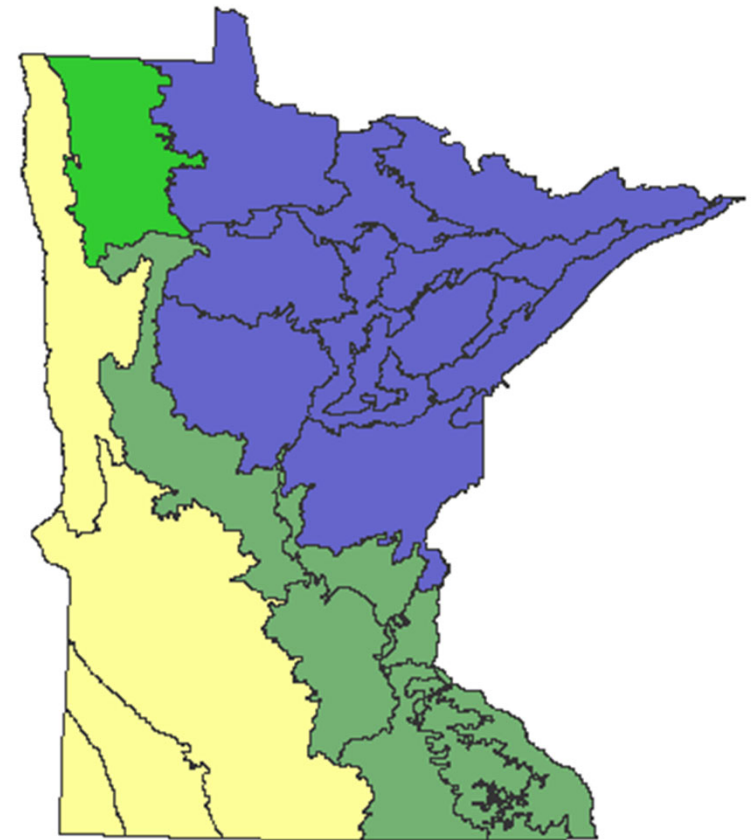


- Clean Transportation
- **Climate-smart natural and working lands**
 - Healthy natural and working lands absorb and store more carbon, produce food and other products, sustain local economies, enhance climate resiliency, and improve the quality of life for all Minnesotans.
- Resilient communities
- Healthy lives and communities
- Clean economy

Good Work in the Right Geography

We shouldn't plant grasslands near Grand Marais

We shouldn't plant forests near Luverne



It's not either/or, it's "and"

Traditionally we talk about habitat in the context of wildlife conservation

Habitat restoration and protection benefits wildlife AND:

- Controls run-off – reducing the economic and emotional costs of flooding
- Recharges groundwater – protecting wells for cities and homeowners
- Filters sediment from the water – keeping our lakes and rivers healthier
- Filters nitrates from the water – keeping drinking water safe for infants and others
- Provides recreational and working lands – benefits to local economies
- **Plays a leading role in climate change –**
 - **directly removing carbon and**
 - **creating a more resilient landscape to adapt to those changes**



We're already doing good things – A New Story for a Wider Audience

OHF projects have been storing carbon all along

We just haven't been talking about it

We don't need to change, just do more

**Gives us a new, more diverse storyline to take
our message to a much larger audience**

wildlife, pollinators, water, carbon, etc





Thank You

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