

Using Multiple Methods to Manage *Phragmites*

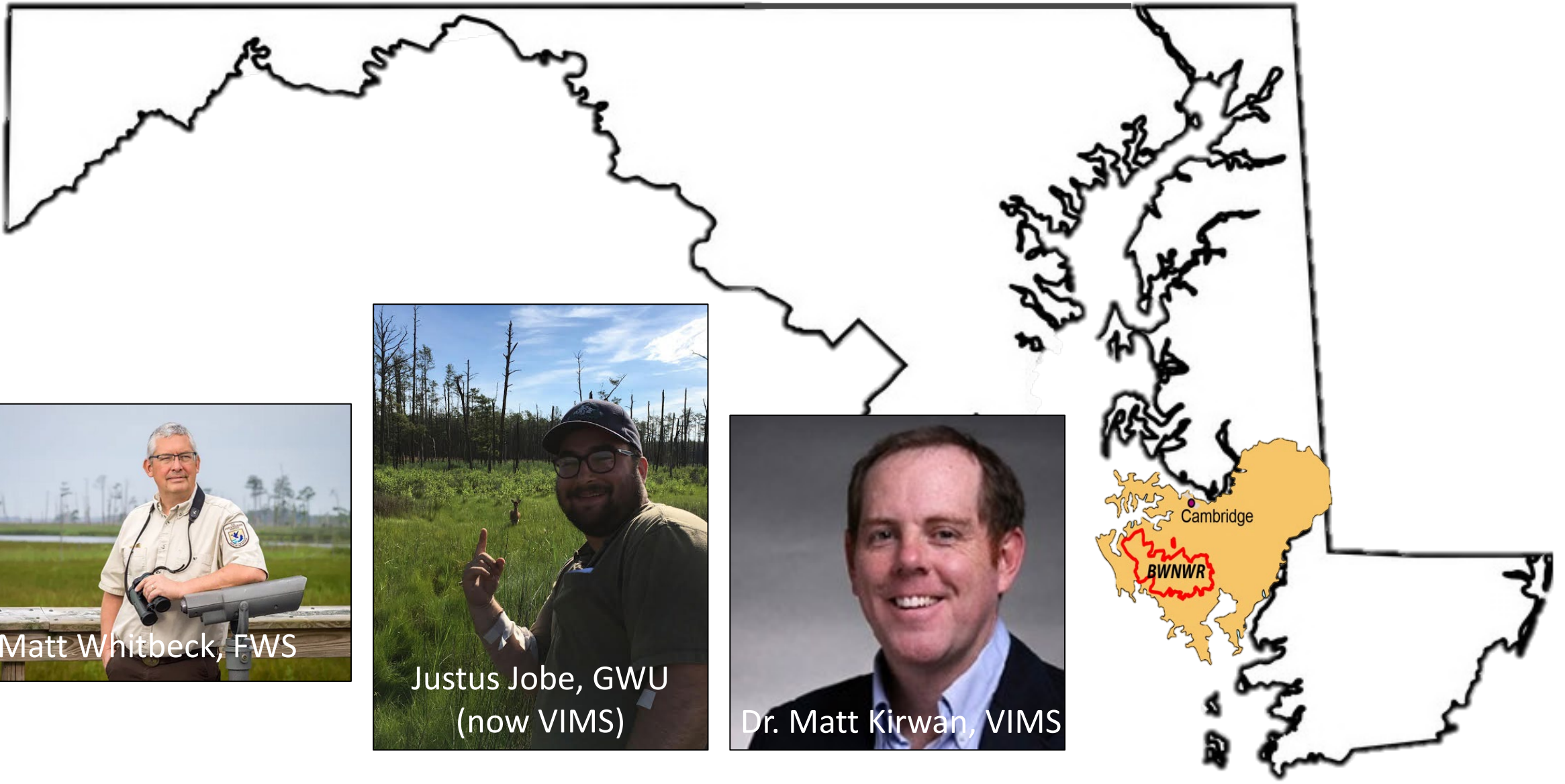
Dr. Serina Wittingham
University of North Florida
September 4th, 2024

THE
CONSERVATION
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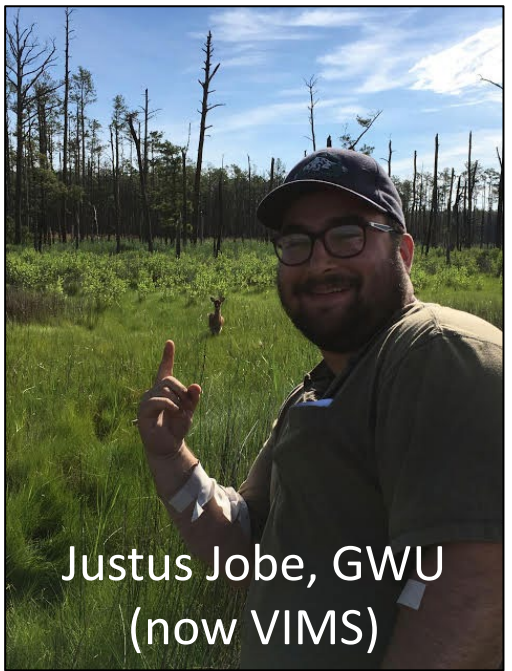


VIMS | WILLIAM
& MARY
VIRGINIA INSTITUTE OF MARINE SCIENCE





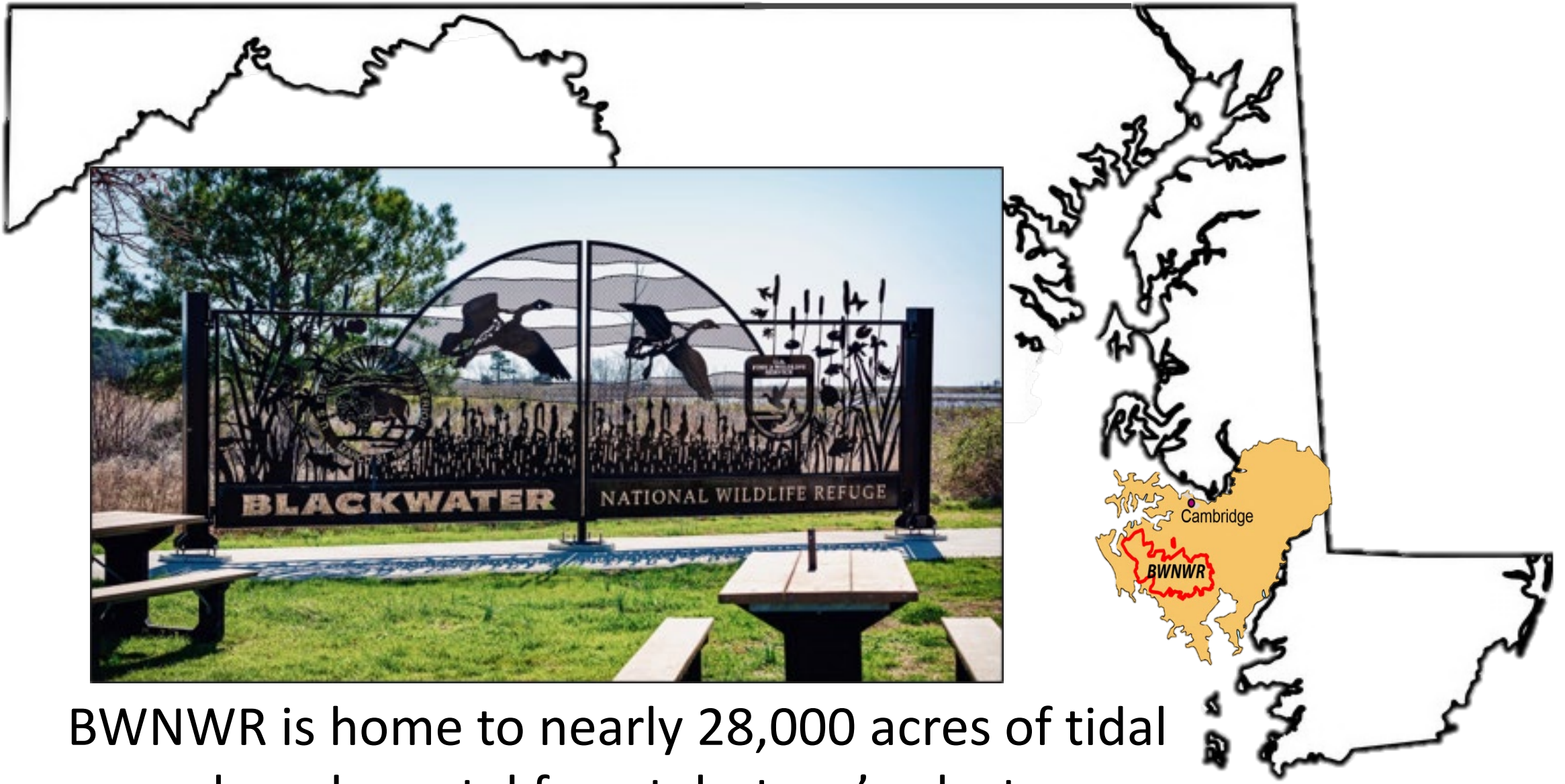
Matt Whitbeck, FWS



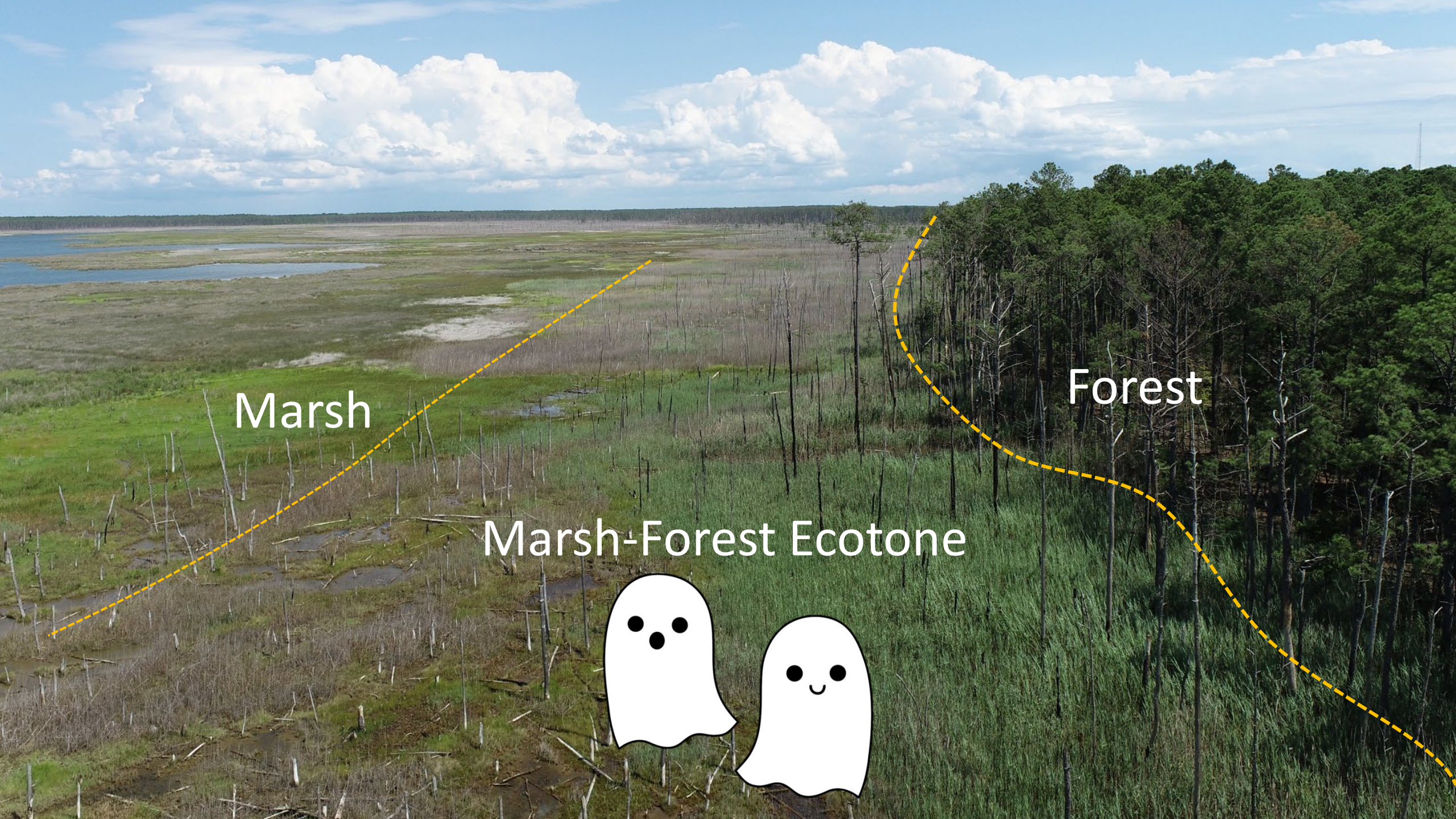
Justus Jobe, GWU
(now VIMS)



Dr. Matt Kirwan, VIMS



Blackwater National Wildlife Refuge (BWNWR) is home to nearly 28,000 acres of tidal marsh and coastal forest, but we've lost over 5,000 of those marsh acres to sea-level rise.



Marsh

Forest

Marsh-Forest Ecotone



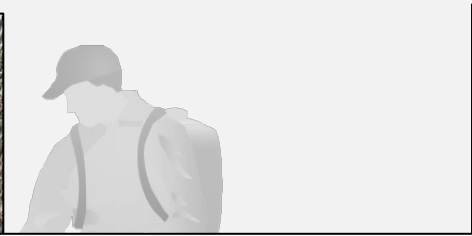




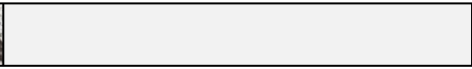
Plant
Functional
Traits



Prescribed fire



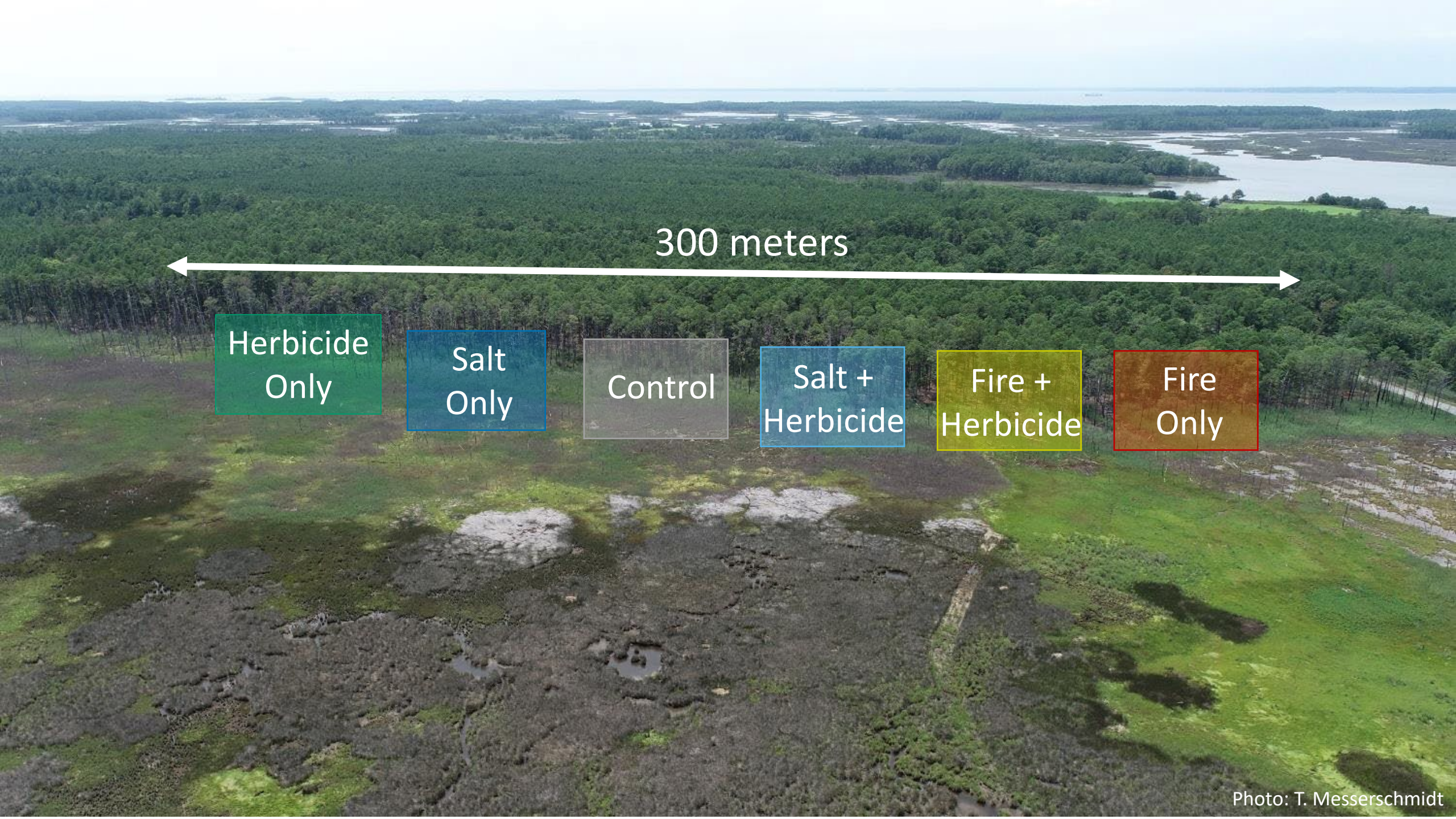
1) *Which* treatment is most effective?



2) *Why* were treatments effective?

Plant
Functional
Traits





300 meters

Herbicide
Only

Salt
Only

Control

Salt +
Herbicide

Fire +
Herbicide

Fire
Only

- 5 sampling plots per transect
 - 1 in the forest, 3 in the phragmites, and 1 in the high marsh

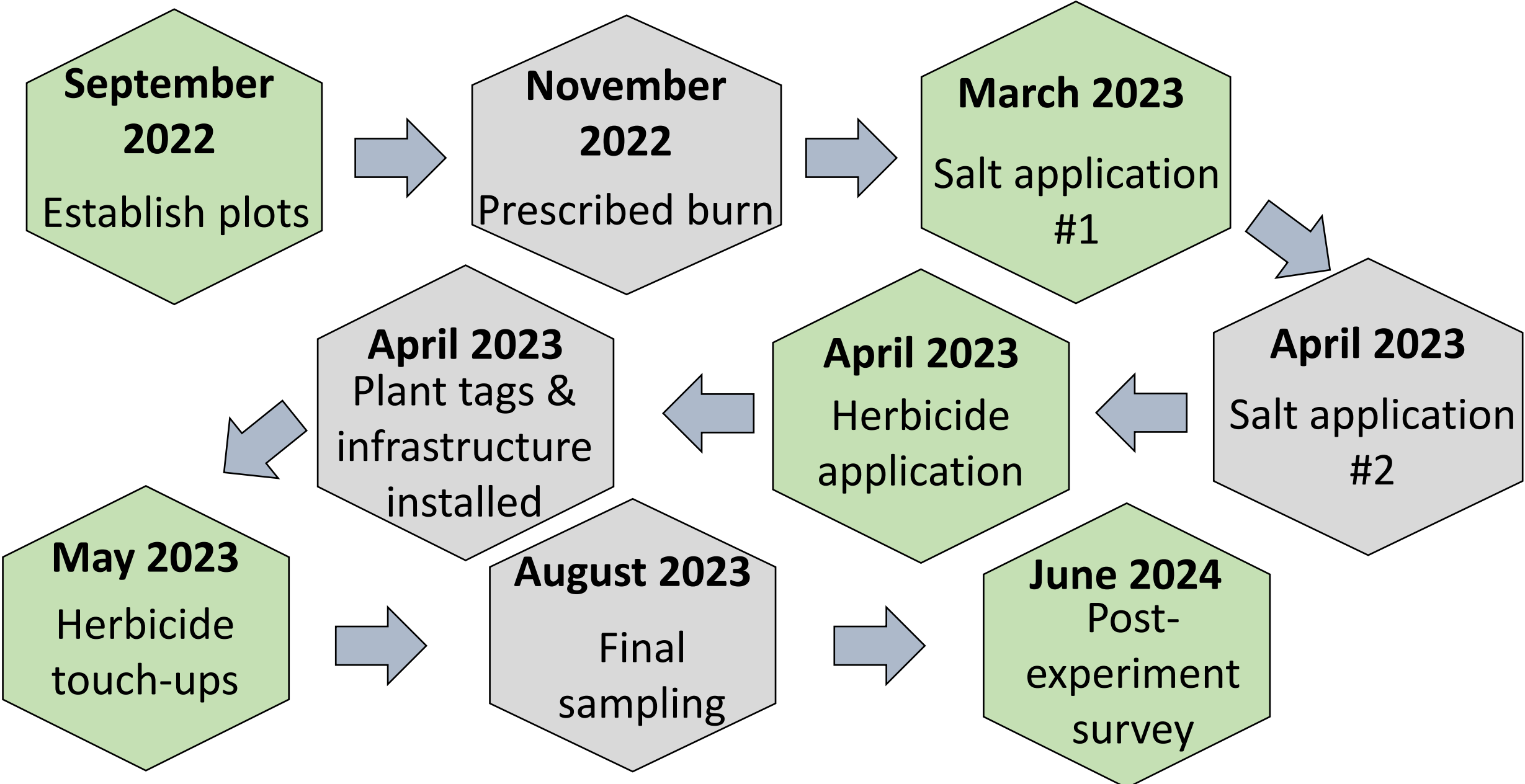
6 treatments (1 plot per):

- fire only
- fire + herbicide
- salt + herbicide
- control
- salt only
- herbicide only

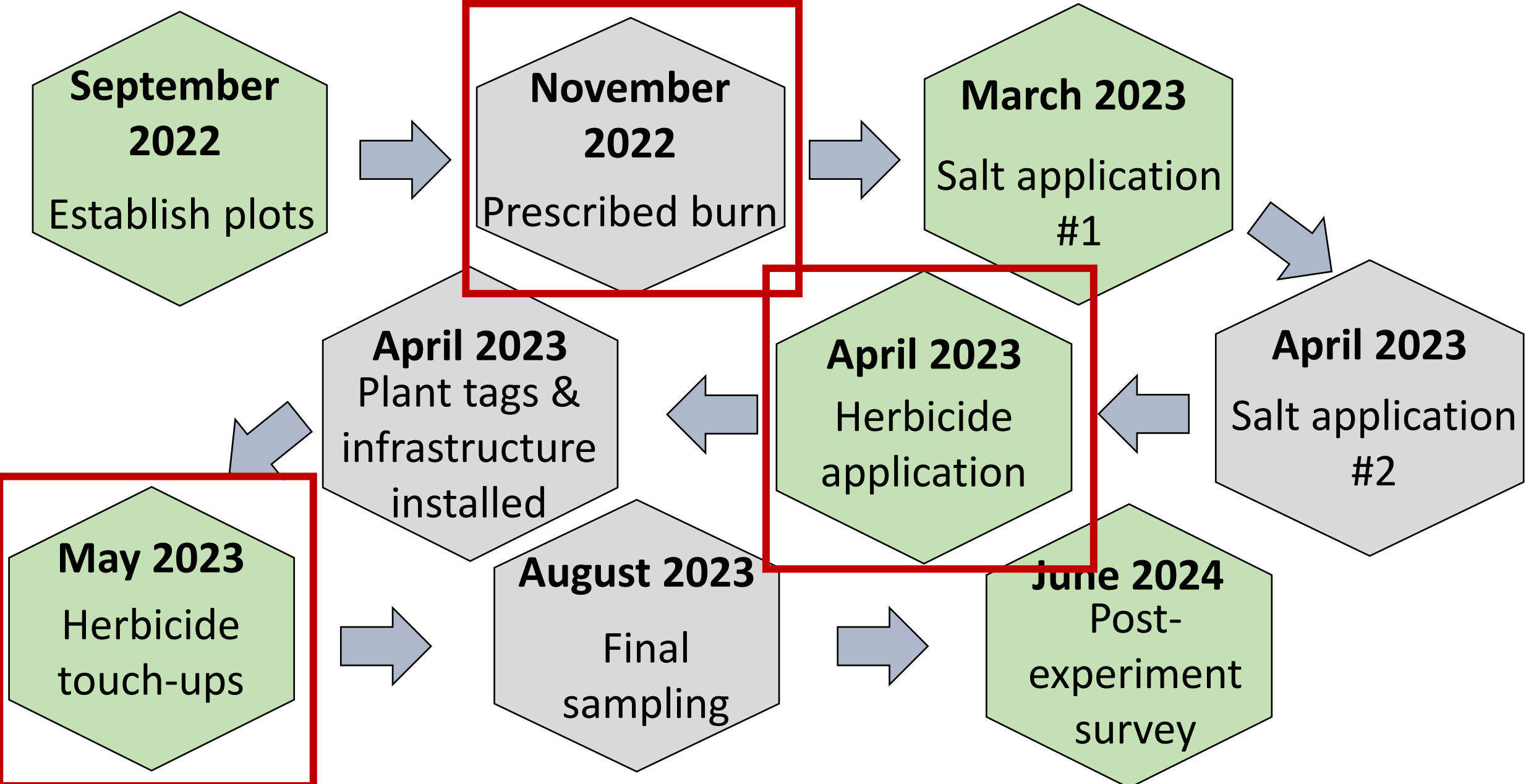


2 x 2 m plots

Timeline of experiment



Timeline of experiment







Which treatment is most effective?

Year 1

Salt alone had limited to no impact on

This is most likely because plots flooded regularly, and salt was flushed from the system before it could sink into the sediment



Salt plot



Control plot

Which treatment is most effective?

Year 1

Herbicide was most effective at decreasing the number of live stems and green tissue



Which treatment is most effective?

Year 1

Herbicide was most effective at decreasing the number of live stems and green tissue



Herbicide only treatments performed better than combination treatments

Which treatment is most effective?

Year 1



BUT, fire alone increased the number of native species present, with 5 unique forest species not seen in any other treatments

Pinus taeda



Bracken fern



Ilex aquifolium



This increase in diversity was maintained in 2024

Which treatment is most effective?

Year 1



BUT, fire alone increased the number of

So what do we manage for? Invasive removal or native species recruitment?



This increase in diversity was maintained in 2024

Why were treatments effective?

Year 2

Herbicide **decreased**:

- Belowground plant tissues
- Energy stores
- Flowering and photosynthetic ability

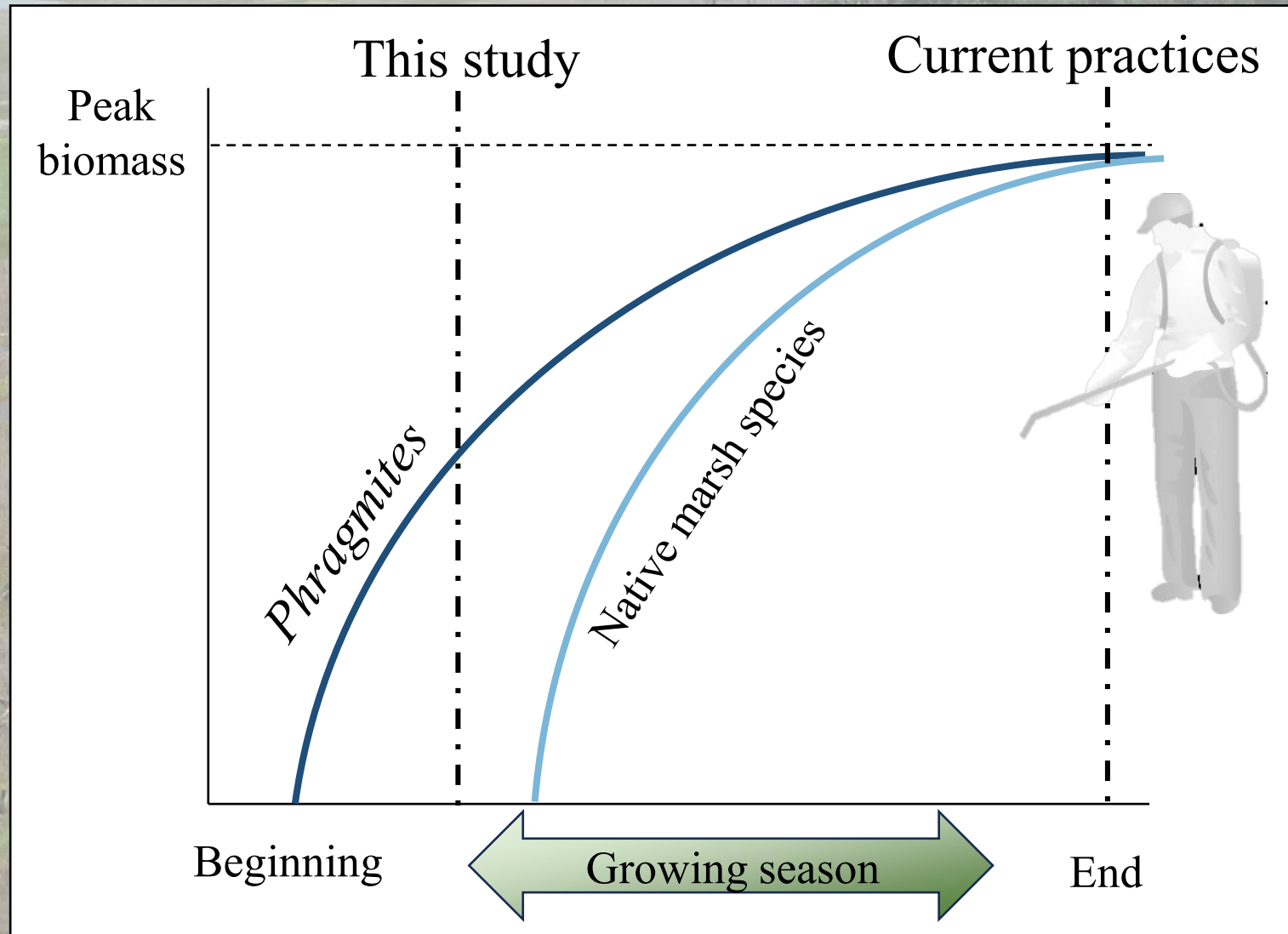
*Herbicide alone was better than fire + herbicide and salt + herbicide treatments

Dr. Wenwen Liu



The timing of herbicide application may be key

Spraying at the beginning of the growing season still targeted *Phragmites* belowground tissues and preserved much of the native plant community



Food for thought

- Could salt be effective if applied differently?
Salt solution?
- Timing of application and combining treatments:
 - Could we burn first, increase native recruitment for a season, then spray early in the growing season to control *Phragmites* growth and maintain native species diversity?