Wooly Frogs Mouth (*Philydrum lanuginosum*) found in Pender County, NC; a first find of this invasive plant in the U.S.

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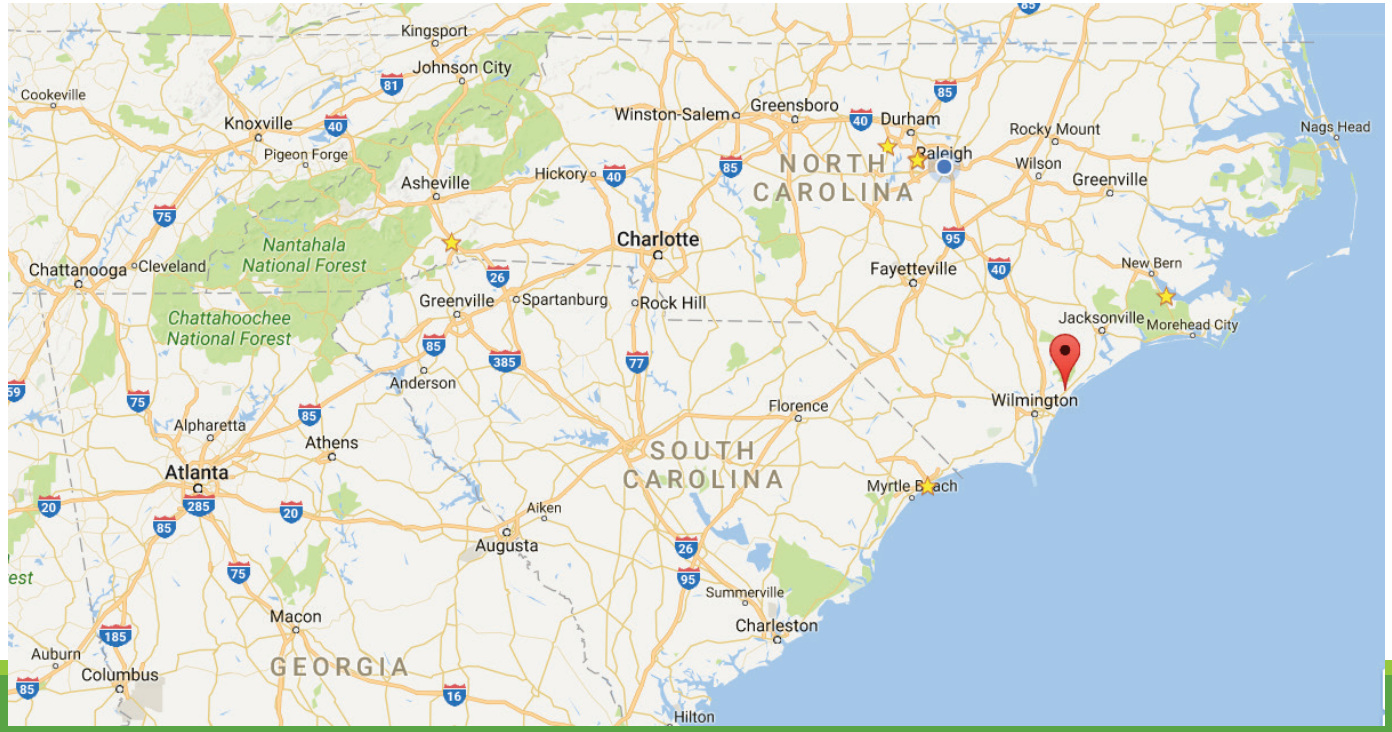
GSARP – MAY 2017

SAVANNAH, GA

Background

- Wooly frogs mouth (*Philydrum lanuginosum*) is an invasive weed found in Pender County, NC on August 3, 2016.

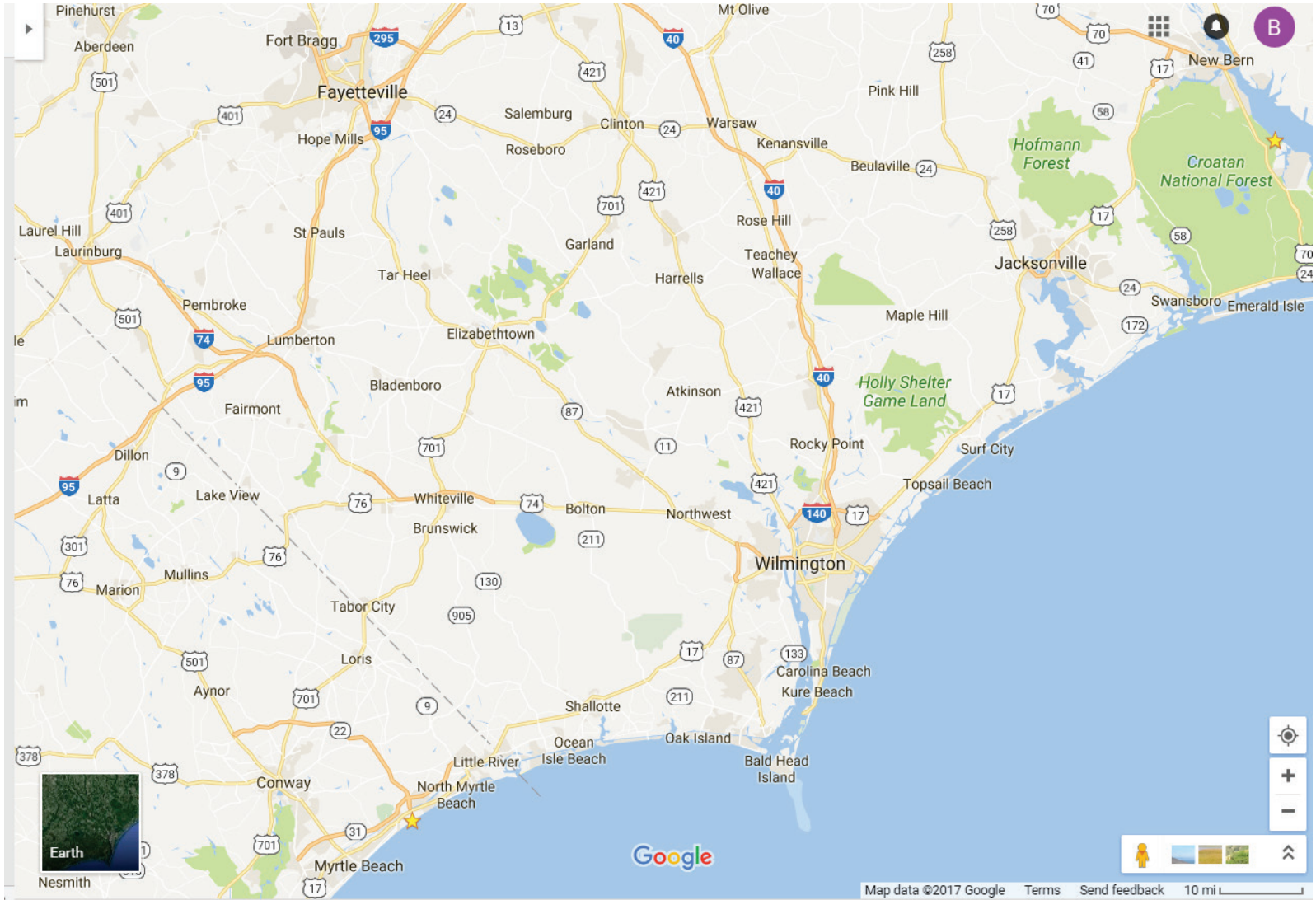


Background

- Wildlife Resources Commission - checked the pond for populations of a rare Gopher Frog.
- Plant had rapidly overtaken an artificial pond located on private land near the Holly Shelter gamelands.

Holly Shelter Gamelands

- 48,795 acres of land used for hunting and hiking



Background

- Identified by botanists at North Carolina State University and the USDA.
- This is the *first reported find* of this weed in the US, which is outside of its native range.

Background

- The plant is commonly cultivated as an aquatic plant in Australia, and seeds and plants are readily available for purchase online.

United States Department of Agriculture

United States Department of Agriculture

Animal and Plant Health Inspection Service

Month DD, YYYY

Version 1

Weed Risk Assessment for *Philydrum lanuginosum* Banks ex Gaertn. (Philydraceae) – Wooly frogs mouth

A population of Philydrum lanuginosum in eastern North Carolina. Habitat and infestation that surrounds pond (top left), Habit (top right), flower (bottom right), and dehisced capsules (bottom left). Photographs taken by Anthony Koop.

Agency Contact:

Plant Epidemiology and Risk Analysis Laboratory
Center for Plant Health Science and Technology

Plant Protection and Quarantine
Animal and Plant Health Inspection Service
United States Department of Agriculture
1730 Varsity Drive, Suite 300
Raleigh, NC 27606

Weed Risk Assessment

- 3 analytical components that describe the risk profile of a plant species (risk potential, uncertainty, and geographic potential).
- The predictive risk model evaluates the plant using information related to its ability to establish, spread, and cause harm in natural, anthropogenic, and production systems (Koop et al., 2012).

Foreign Distribution and Status

Native to

- Asia (India, Malaysia, Myanmar, Papua New Guinea, Thailand, and Vietnam)
- China
- Japan
- Northern Australia
- Palau
- Taiwan

Also reported in Cambodia and Laos.

US Distribution and Status

- Plant has been reported in the US by any major plant database (e.g., EDDMapS, 2016; Kartesz, 2016; NRCS, 2016).
- We found no evidence that this species is commercially cultivated in the United States.
- Specimens are grown at the Santa Barbara Botanic Garden, and the University of Connecticut research greenhouse.
- The Missouri Botanical Garden also grew a specimen, but it died in 2001.
- Another specimen was kept in the research greenhouse of California State University at Chico.

Progression of Plant - 2013

Progression of Plant - 2016

Establishment /Spread

- self-pollinating
- millions of seeds
- Seeds can float
- Seeds likely dispersed by birds, wind, and people
- Seeds readily germinate in water
- seedlings can float

Seed Dormancy/Viability

The NCDA&CS lab was able to successfully germinate some of the seeds just days after they were collected, with no dormancy requirements.

Density of Plants

- Based on this species' behavior at the North Carolina site and other aspects of its biology, we believe it has a high capacity to establish and spread.

Impact Potential

Based on the abundance and density of plants

- we believe the plant could affect local species diversity,
- may present a threat to Threatened and Endangered plant species that are restricted to marshes, bogs, and other similar habitats.

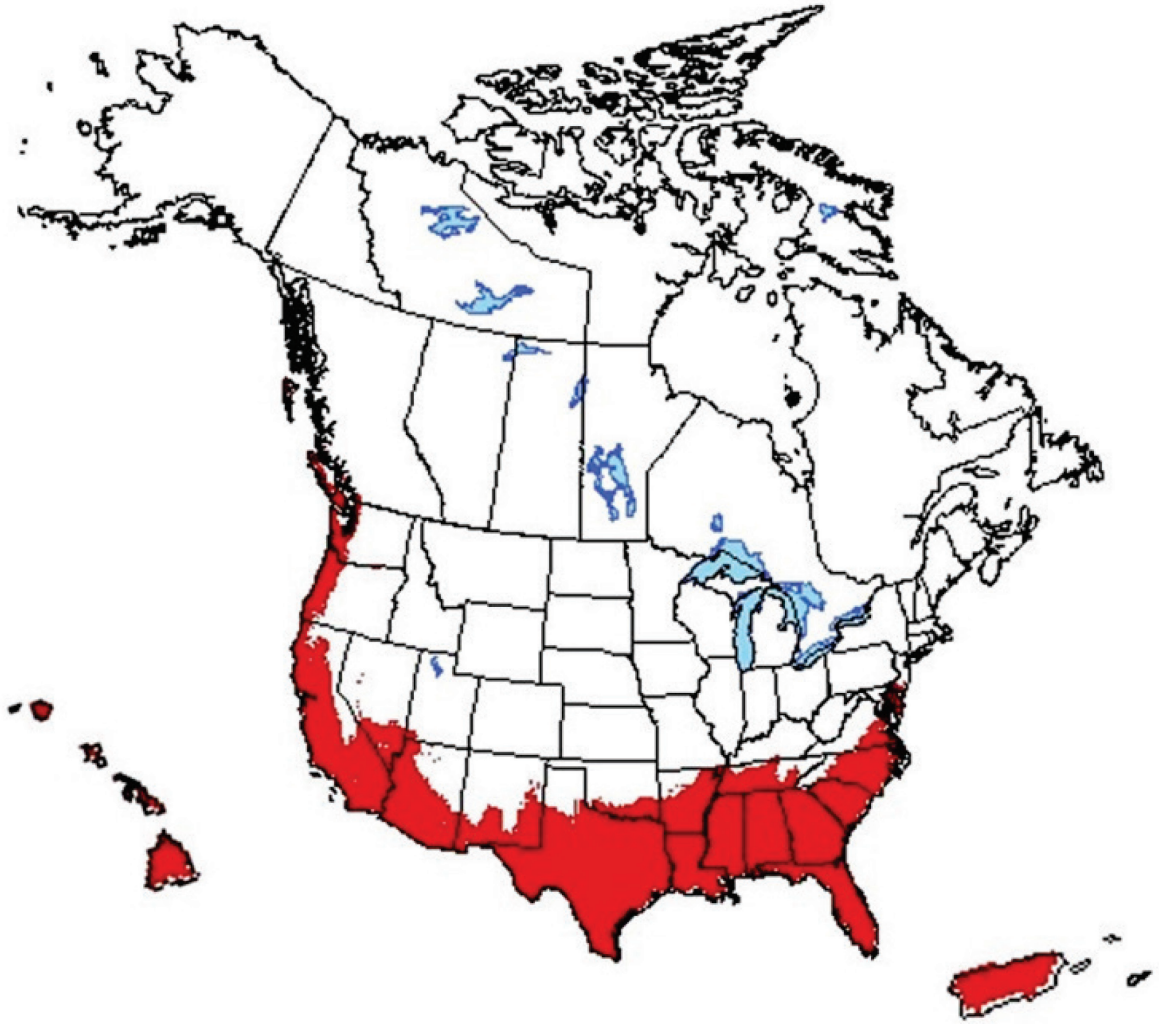
It is unknown what impacts it may have on the long term survival of gopher frogs at this pond; gopher frogs are a federal species of concern.

Impact Potential

- considered a weed of rice and plantation crops in southern Thailand
- reported to be toxic to cattle and fresh water turtles but we found no information on the specific cause of this toxicity.

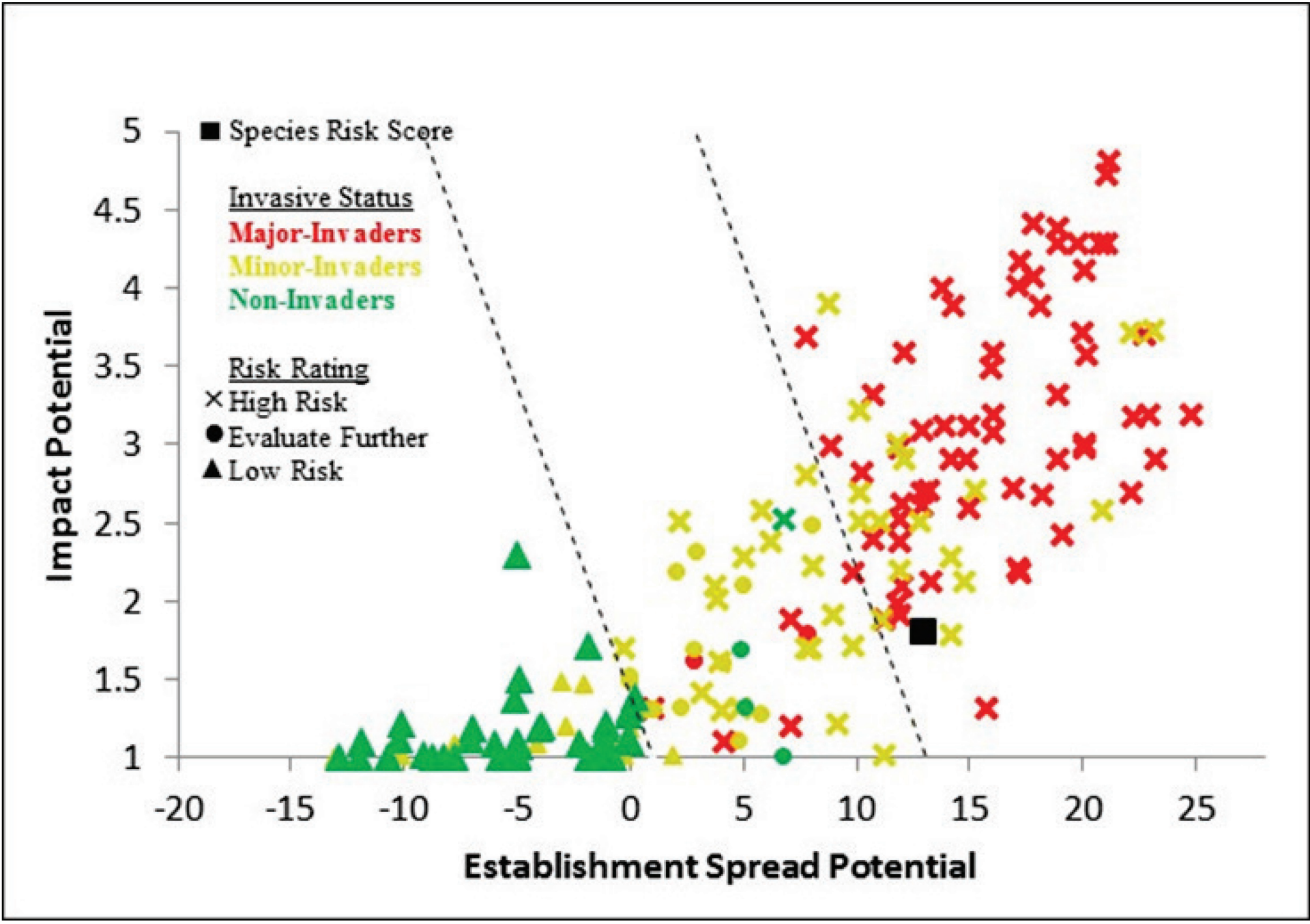
Geographic Potential

Based on three climatic variables, we estimate that about 27% percent of the southern coastal region of the United States is suitable for establishment.



Results

- The result of the weed risk assessment for *P. lanuginosum* is High Risk
- This result was almost exclusively driven by this species' ability to escape and spread.
- Furthermore, because this is the first report of its naturalization outside of its native range, there is no precedent for how it may behave outside of its native range.


Species Risk Score
Invasive Status
Major-Invaders
Minor-Invaders
Non-Invaders
Risk Rating
High Risk
Evaluate Further
Low Risk
Impact Potential
5
4.5
4
3.5
3
2.5
2
1.5
1
-20
-15
-10
-5
0
5
10
15
20
25
Establishment Spread Potential

Herbicide Treatment

A 5% rate of glyphosate (Rodeo) was sprayed on October 4th, 2016.

Monitor and Eradicate

- Eradication efforts are ongoing, and monitoring of this site will continue for several years.
- Other ponds in the Holly Shelter area were inspected for additional populations of the plant.

Follow-Up Spring 2017

NCDA & CS
Plant Industry Division
Plant Protection Section

PEST ALERT

Wooly Frogs Mouth

Philydrum lanuginosum

Wooly frogs mouth (*Philydrum lanuginosum*) is an invasive weed that was found to be growing in Pender County, NC on August 3, 2016. The plant was concurrently identified by scientists at North Carolina State University and the United States Department of Agriculture. This is the first reported find of this weed in the US, which is outside of its native range. The plant is commonly cultivated as an aquatic plant in Australia, and seeds and plants are readily available for purchase online. Officials were notified about the presence of the plant after biologists with the Wildlife Resources Commission checked the pond for populations of a rare Gopher Frog. Biologists noted that the plant had rapidly overtaken an artificial pond located near the Holly Shelter gamelands. The pond was dug between 2005 and 2010 and the population of wooly frogs mouth is known to have been in place since 2013. Photos of the pond dating from 2013 show just a few isolated plants along the margin of the pond, but the current population is much higher.

Identification

Wooly Frogs Mouth is an herbaceous, perennial, aquatic plant that can grow between 20 and 70 inches tall. The spongy flat leaves are linear and grow between 11 and 28 inches in length. Many yellow, bilateral and symmetrical flowers are produced on a simple spike, and are self-pollinated. Each flower only blooms for one day, and each "pod" on the fruiting structure contains hundreds of tiny seeds. The seeds were observed floating in water, and will germinate when conditions are right. The NCDA&CS lab was able to successfully germinate some of the seeds just days after they were collected, with no dormancy requirements. This plant has short rhizomes and a fibrous root system. The plant prefers full sunlight to 50% shade, and can grow in up to two feet of water, but is mostly a marginal plant that prefers to grow in coastal and inland climates.

Geographic History

Wooly Frogs Mouth is native to tropical Asia (India, Malaysia, Myanmar, Papua New Guinea, Thailand, and

How to Report a Suspected Infestation

- NCDA&CS, Weed Specialist.
- 1-800-206-WEED (1-800-206-9333).
- Take GPS Coordinates.
- Take digital pictures and email to (bridget.lassiter@ncagr.gov).

Questions???