Stakeholder Perspectives: Genetic Biocontrol Technologies in Aquatic Invasive Species Management in the Great Lakes region.

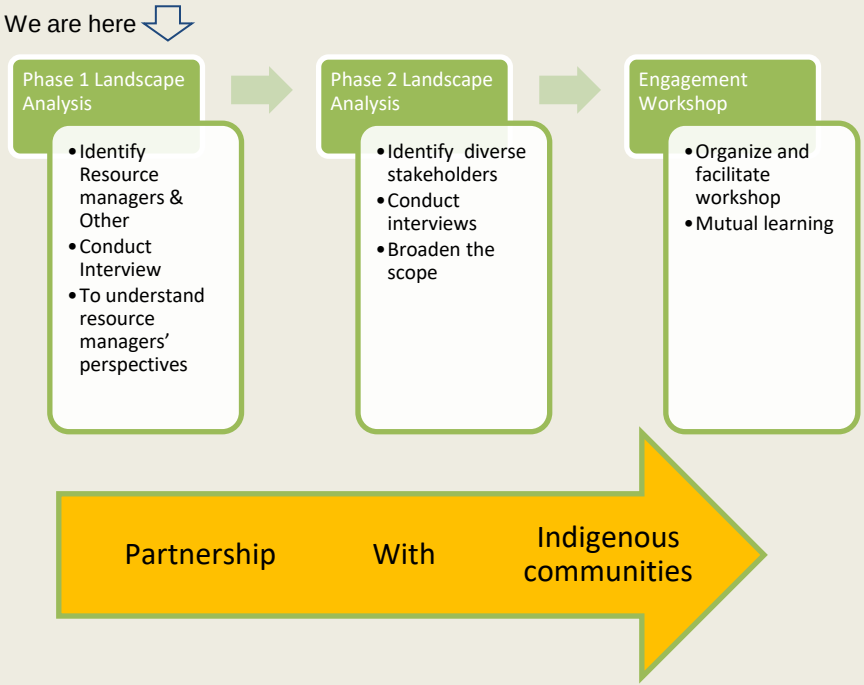
Rex Alirigia

Great Lakes Panel on Aquatic Nuisance Species (11/15/2023)

Motivation

- To facilitate innovative pathways and create baseline data.
- To lay the groundwork for constructive and inclusive governance among scientists, resource managers, and other stakeholders.
- Public and stakeholder engagement

Project Background



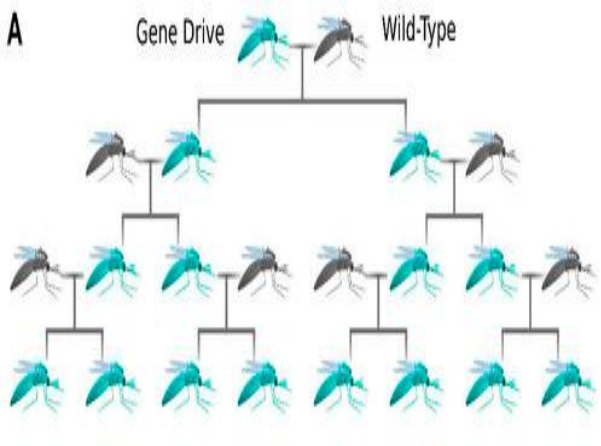
- **Completed phase 1**

<u>Next activities</u>

- Phase 2 Landscape Analysis
- Indigenous communities.
- Engagement workshop

What is genetic biocontrol?

- Intentional release of genetically modified organisms to disrupt the reproduction of invasive species.



Outcome

- Population suppression/reduction

Features

- Persistence and spread

Potential application

Public health

Conservation

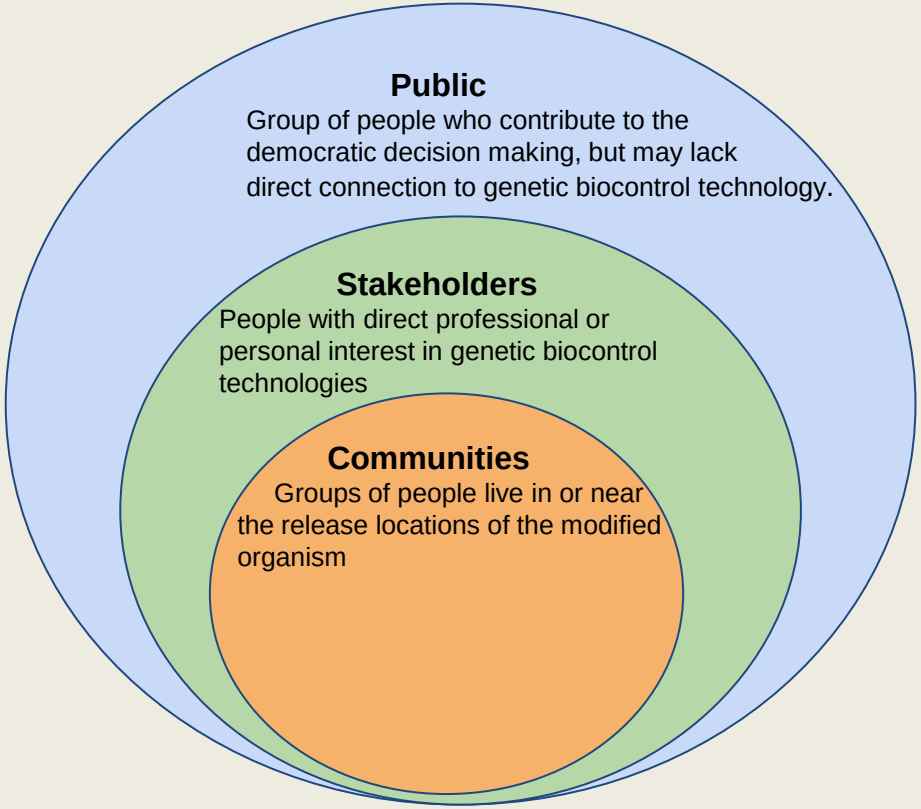
R&D

Agriculture

Responsible Research Innovation

Dimension	Indicative approach to genetic biocontrol technology in AIS management
Anticipation	Participatory assessment to identify the technical, regulatory and socio-political issues of genetic biocontrol technologies.
Reflexivity	Rethinking and redefining the scope of the technology; awareness of assumptions on the design and use of genetic biocontrol technology in AIS management.
Inclusion	Create opportunities to include scientists, resource managers, indigenous communities, and diverse stakeholders to create mutual learning
Responsiveness	Responding directly to the outcomes of the engagement on the R&D of genetic biocontrol technology.

Owen,2012



Defining public engagement
NASEM 2016

"Public engagement cannot be an afterthought"

- The outcome of engagement is crucial to the development, decision making and implementation of the technology

Methods

- Online searches and snowball sampling.
- Conducted 20 interviews (3 in-person and 17 via Zoom): 13 Resource managers, 3 Scientists and 4 Regulators.
- Dedoose qualitative: Initial codes were generated from the responses to questions.
- **Coded for key insights related to:**
  - R&D of genetic biocontrol technologies, and research funding
  - Benefits and concerns of genetic biocontrol technologies in AIS management
  - Risk assessment, safety, and regulatory approvals.
  - Stakeholder engagement

R&D and funding of genetic biocontrol technologies

Center for Genome Engineering

UNIVERSITY OF MINNESOTA
GENOMICS CENTER

INNOVATION LAB

WISCONSIN
UNIVERSITY OF WISCONSIN-MADISON

U.S. FISH & WILDLIFE SERVICE
DEPARTMENT OF THE INTERIOR

USGS
science for a changing world

MINNESOTA AQUATIC INVASIVE SPECIES RESEARCH CENTER
UNIVERSITY OF MINNESOTA
Driven to Discover℠

Benefits

- Genetic biocontrol *“can be highly selective”* and *“specific”* unlike *“traditional techniques with chemical control”*.
- An additional alternative to the integrated pest management tools.
- Potential to minimize environmental impact.

“I want to speak candidly to you, I think, they present a very good alternative, for the control of challenging invasive species or pests, for example, however, I also am very cautious”.

Concerns

- *“There’s little known background of the technology”.*
- *“The possibility of unintended or impact to non—target organisms”.*
- *“Public perception” and ”unforeseen risk to the environment”*

“I think that a robust risk assessment would need to be conducted for us to feel like it would be a safe technology to release”

Risk assessment

- A collective risk assessment: Communities, inter-jurisdictional partners, experts.
- Risk assessment should be context-specific. e.g. species, location
- Product characterization, human health, environmental evaluation, after-effects

Regulation and governance

- Institutional ethics committees (Institutional/personal responsibility).
- Existing governance and regulation (EPA, FDA &USDA).
- Inter-jurisdictional governance.
- Potential updates to permitting/regulation/governance.
- Social values & the culture of fish.

Rights holders/Stakeholder engagement

- Consensus on early engagement.
- The outcome of these engagements are important.

"indigenous communities", "anglers", "lake associations", "lakeshore property owners", *"watershed District managers"* and even *"commercial fishing associations"* who live and make their livelihood from these waters.

Discussion

- Early engagement is as crucial as the R&D outcome of the technology. (values, issue framing, etc.)
- Collective risk assessment to understand unintended effects.
- Existing regulation and governance of genetic biocontrol.
- Regulation of genetic biocontrol is likely to lead to updates to gene drive regulations.

- Who else should be engaged?

Please scan the QR code.

Acknowledgement

- Study participants
- Project team

  - Dr. Katie Barnhill: Acting PI
  - Dr. Jason Delborne (Sabbatical)
  - Jill Furgurson: PhD Student.
  - Rex Alirigia: PhD Student

Funding & Support

U.S. FISH & WILDLIFE SERVICE
DEPARTMENT OF THE INTERIOR

Great Lakes RESTORATION

NC STATE UNIVERSITY

Thank you

Dr. Jason Delborne
jadelbor@ncsu.edu

Rex Alirigia
ralirig@ncsu.edu