 



 Funded by National Science Foundation STS grant #1533990 

**Roadmap to Gene Drives:**

***A Deliberative Workshop to Develop Frameworks for Research and Governance* February 24 – 26, 2016 North Carolina State University Genetic Engineering and Society (GES) Center**

***Chatham House Rules will apply***

**Day 1: Wednesday, February 24**

7:45 Bus from hotel to Hunt Library, Duke Energy Hall (2nd floor)

8:00 Registration, continental/light breakfast

8:30 Welcome – Fred Gould, Moderator for day 1

 Introductory Remarks – Jennifer Kuzma

 Remarks - Alan Rebar, Vice Chancellor of Research, Innovation, and Economic Development

 Review of scope of workshop and publication outputs – Jennifer Kuzma

**Session 1.1 Brief presentations and discussions of papers on the Case Studies**

 9:15 *Harnessing Gene Drive Systems* – Kevin Esvelt

* + - * Discussion

9:55 Paper #1 Title – Austin Burt

* + - * Discussion

10:35 Coffee break

10:50 *Eradicating invasive rodents from islands: An assessment of current and future technologies* – Caroline Leitschuh

* + - * Discussion

11:30  *Agricultural Production: Assessment of the Potential use of Cas9-mediated Gene Drive Systems for Agricultural Pest Control* – Max Scott

* + - * + Discussion

12:15 Working lunch

 *The Role of Ethics in Gene Drive Research and Governance* – Paul Thompson

* + - * Discussion

**Session 1.2 Development of Typology for Technologies and Ethical Issues Associated with Technologies and Cases**

1:15 Small group breakouts

* + - Group assignments by case study
* *Outputs?*
* *What are the key ethical issues associated with the cases?*

2:45 Return to large group – disseminate results by small group

3:50 Coffee break

4:00 Large group discussion: Overarching framework to consider ethical issues

4:45 Setting Agenda for Day 2

5:15 Catered dinner

 6:00 Bus from Hunt Library to hotel

**Day 2: Thursday, February 25**

8:20 Bus from hotel to Hunt Library

8:30 Breakfast/networking

9:00 Opening Remarks – Jason Delborne, moderator for day 2

 Review Wednesday and qualitative systems mapping tutorial – Jennifer Kuzma

**Session 2.1 Brief Presentation and discussion of papers in issue domains**

9: 30 *Identifying ecological and human-health issues associated with deliberate or accidental release of gene-drive modified organisms* – Keith Hayes

* + - Discussion

10:10 Paper #9 Title – Paul Mitchell

* + - Discussion

10:50 Coffee Break

11:00 Paper #6 Title – Megan Palmer

* + - Discussion

**Session 2.2 Collaborative systems modeling to identify important relations and variables, and integrative thinking across biology, policy, economics, and ethics**

11:40 *Democracy, Risk Assessment and GMO’s* – Zahra Meghani

* Discussion

12:00 *Get out the Map: Is there a route towards a social license to operate for gene drives?—*Todd Kuiken

* Discussion

1:00 Working lunch during breakouts

 Small group Collaborative Systems Mapping (CSM) to identify research needs

 (ecological, social, economic, ethical and policy) for 3 cases and for governance

* Small Group Breakouts
* Group assignments by subject (12 groups)
* *Thinking about the case study and issue focus (e.g. human health application of gene drives and policy issues) what are the key variables (stocks) that we as a society care about in systems into which gene drives would be employed?*
* *How do we expect those variables to be affected by deployment of gene drive technologies?*

3:00 Coffee break

3:15 Return to large group: disseminate results of CSM

* Top 3 observations

4:30 Setting agenda for Day 3 (review and input for any modifications)

4:50. Bus to Poole restaurant

5:00 Reception @ Carol Johnson Poole Restaurant (drinks and appetizers)

6:30 Bus to hotel, dinner on your own

**Day 3: Friday, February 26**

8:20 Bus from hotel to Hunt Library

8:30 Breakfast/networking

9:00 Opening Remarks – Jennifer Kuzma and Heike Sederoff, Moderators for day 3

 Review Thursday and plans for moving forward with outputs

**Session 3.1 Identifying Key Research and Governance Needs—Observations across Cases and from System Maps, Issue Frameworks, and Typologies**

* Compare frameworks, maps, and research needs across case studies—can meta-analysis reveal more general structures that can be used to evaluate gene drives in the future?
* Discuss and list key needs for research and governance (note: governance will be considered broadly—from research choices and funding, through technology development, review, dialogue, and deployment).

9:30 Large group discussion to clarify any issues and frame discussion

* *Synthesize governance and research system issue across case study and knowledge domains*

10:00 Small group breakouts

* *Listing of research needs and governance needs*

11:00 Coffee Break

11:10 Large group discussion and consolidating lists

* *Groups compare/contrast findings and present*
* *Areas of disagreement and agreement*
* *Is there accessible information that could resolve any disagreements about the broad governance issues and the case study issues?*

**Session 3.2 Outputs of Workshop and Moving Forward**

12:30 Working lunch with paper authors—roundtables for input to authors

 Or ad hoc groups to convene for additional paper ideas.

1:30 Reporting to large group on papers for volume and for outreach summaries:

* all participants are welcome to author papers for the volume or co-author outreach summaries
* PubPub

1:50 Summary of outputs and dissemination

 *Ideas for ongoing discussion in this community and with broader publics*

2:00 Adjournment

2:15 Bus to airport or hotel