

An aerial photograph of a vineyard, showing rows of grapevines in various shades of green and brown. A semi-transparent circular overlay is positioned on the right side of the image, containing text and a logo.

UNIVERSITY  
*of* GUELPH

# Braiding knowledge

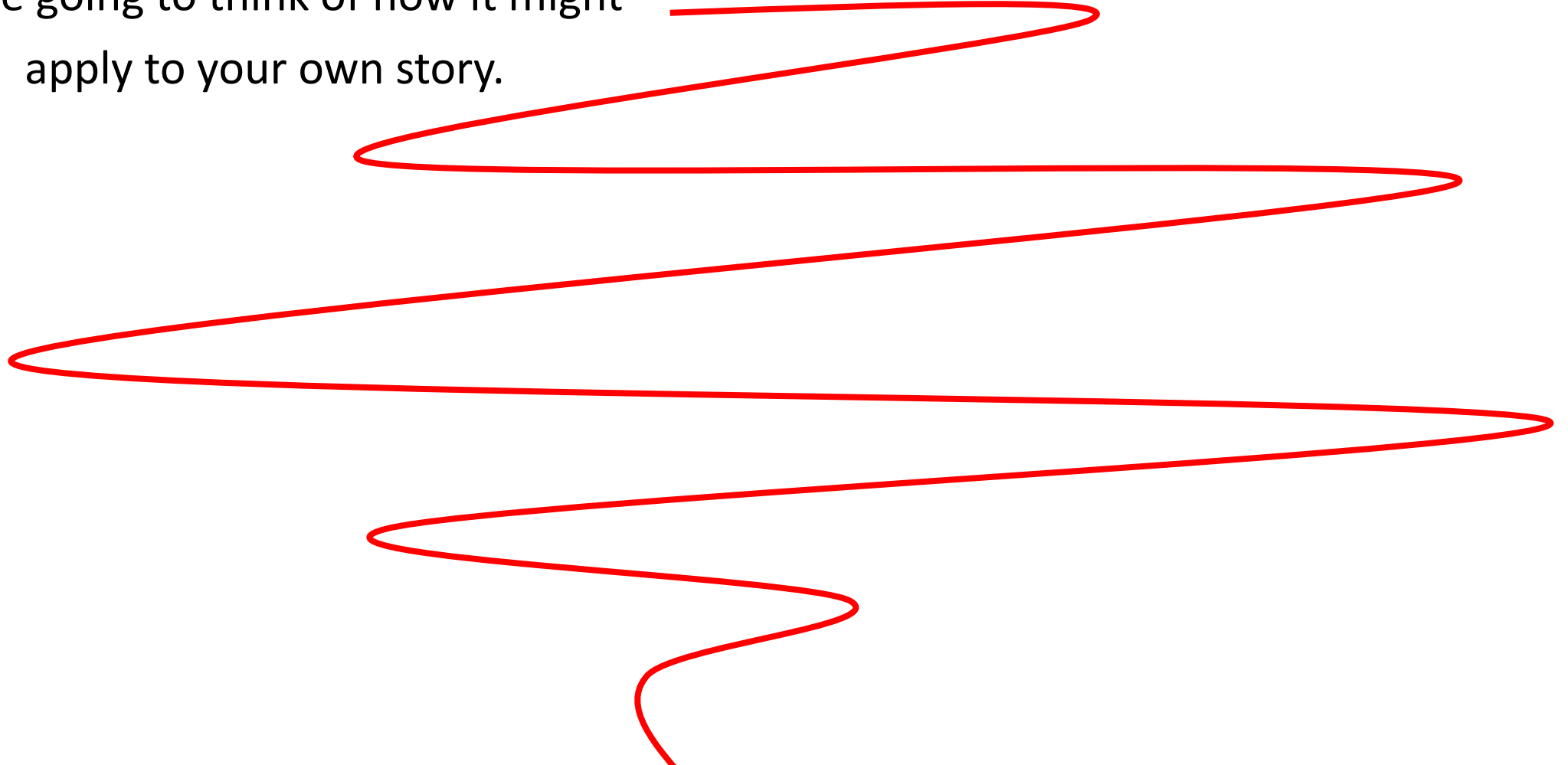
Exploring the use of UAV systems technology as a  
communications tool for tacit knowledge holders

 green feet

# Agenda

My friend and I are going to tell you the story of our work.

You are going to think of how it might  
apply to your own story.

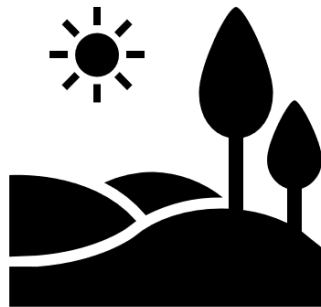


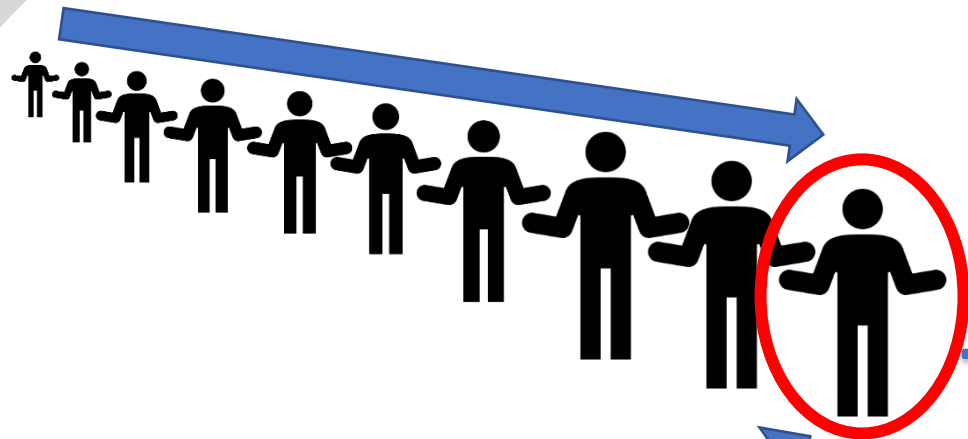


Once upon a time...

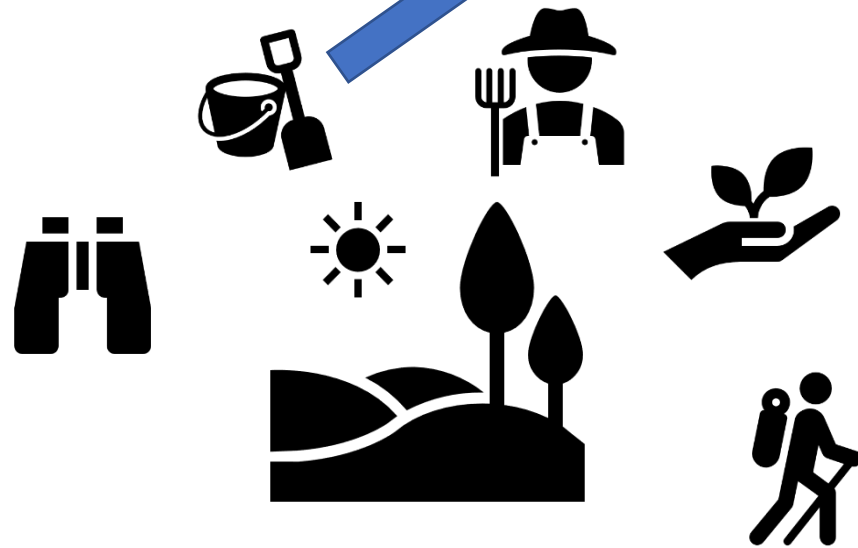


Once upon a time...



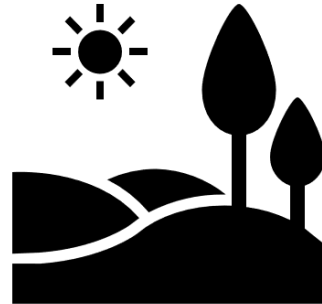


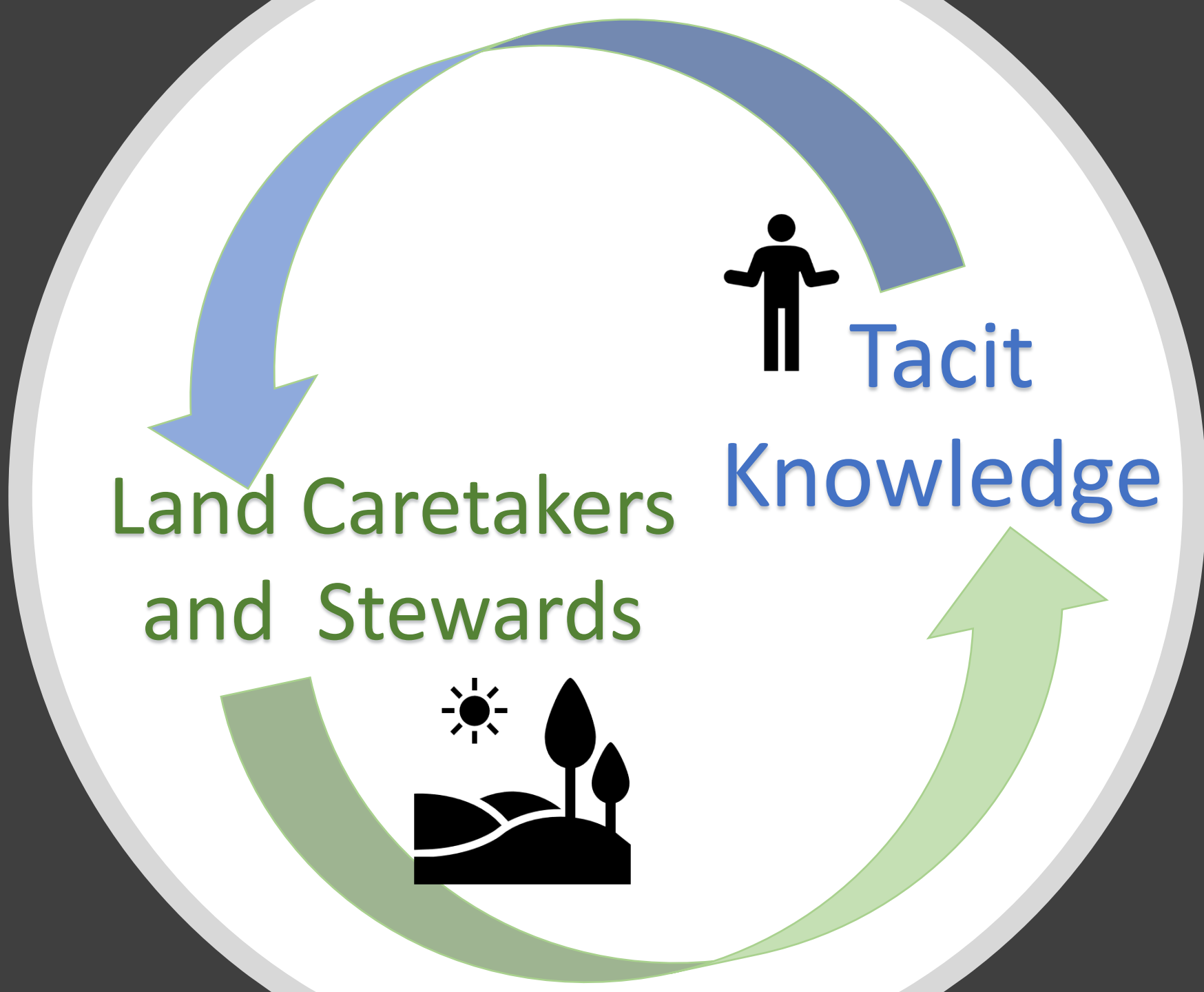
Tacit  
Knowledge





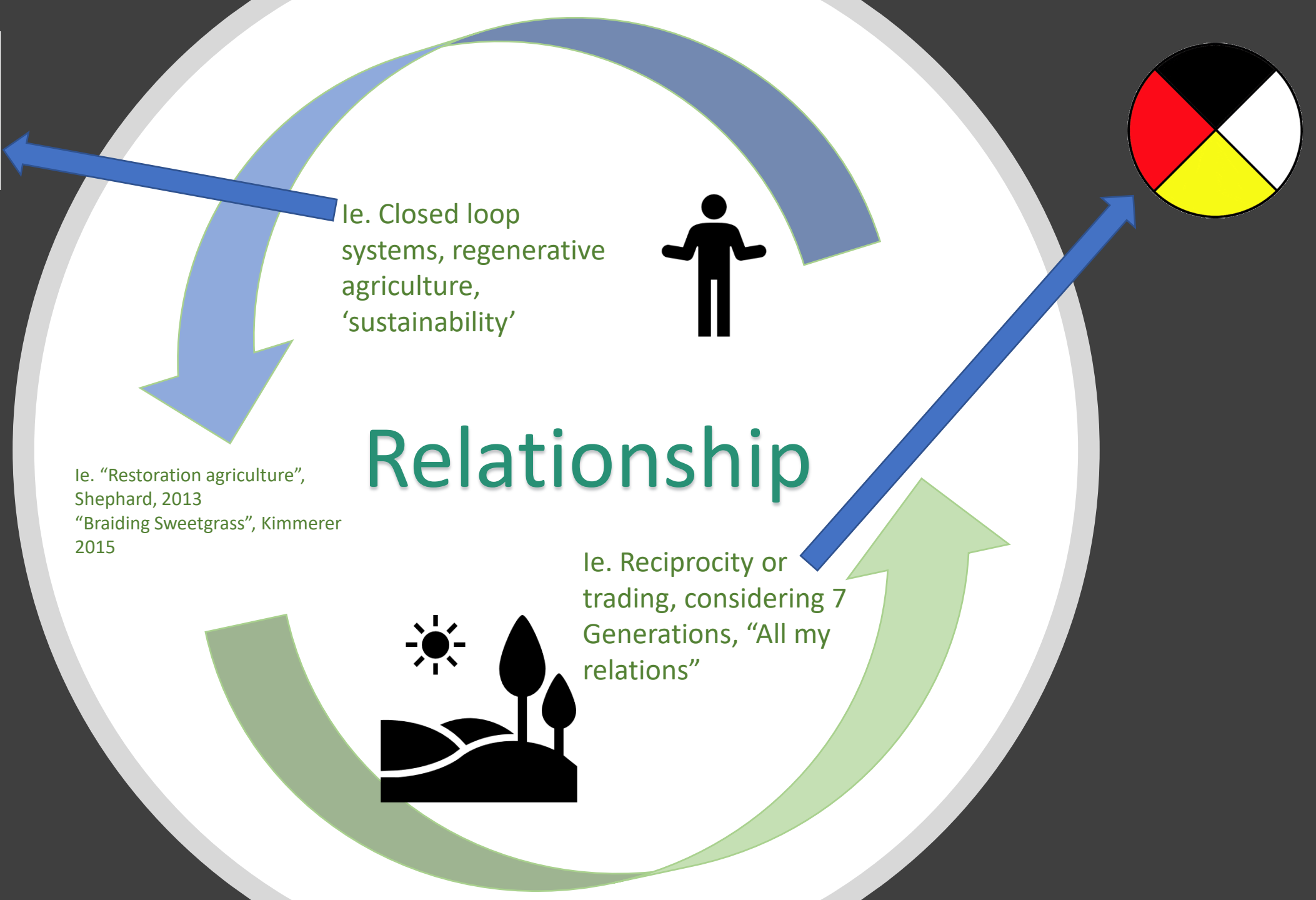
# Tacit Knowledge





Land Caretakers  
and Stewards

Tacit  
Knowledge



ie. Closed loop systems, regenerative agriculture, 'sustainability'

# Relationship

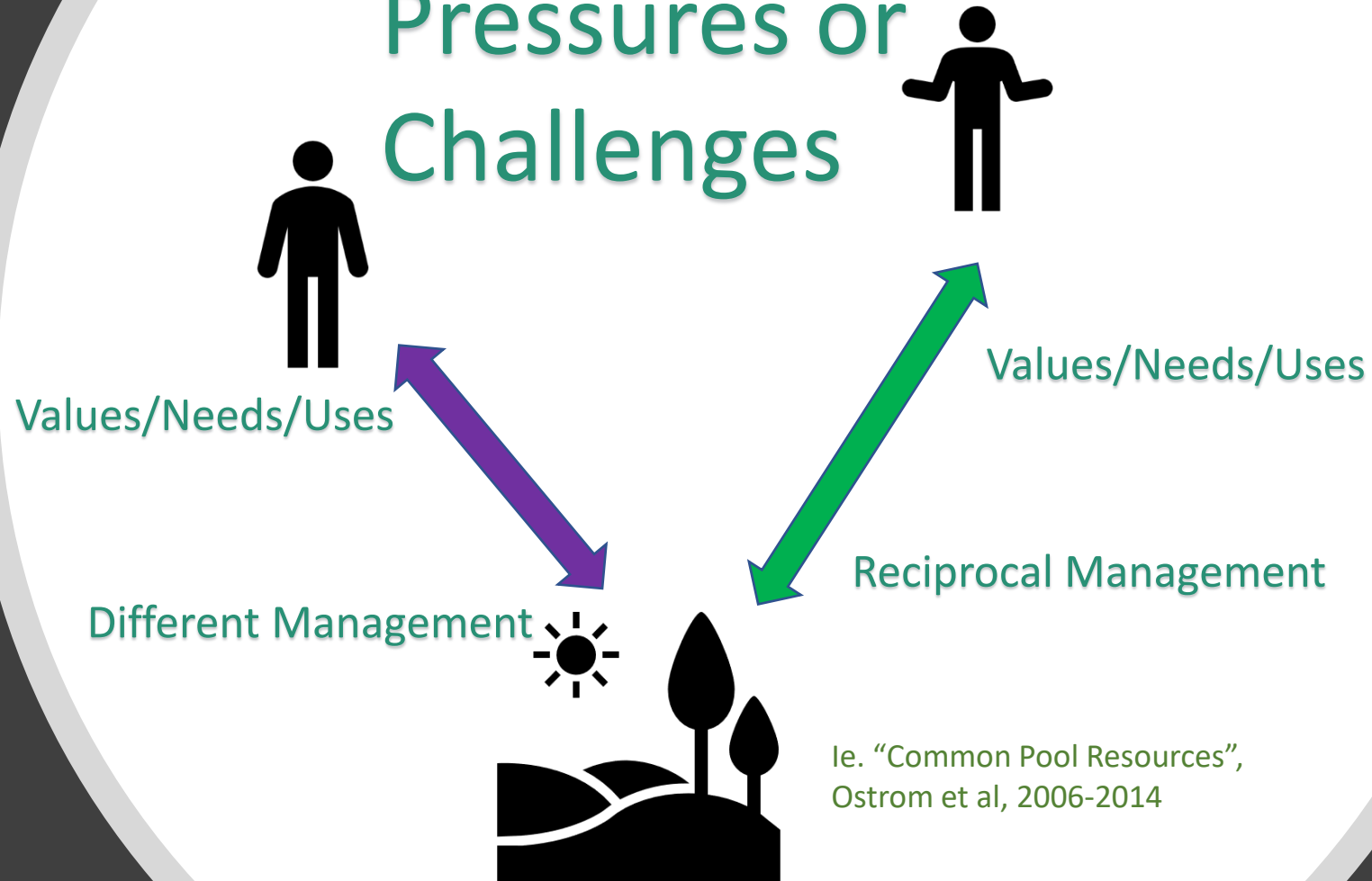
ie. "Restoration agriculture", Shephard, 2013  
"Braiding Sweetgrass", Kimmerer 2015

ie. Reciprocity or trading, considering 7 Generations, "All my relations"





# Conflicts, Pressures or Challenges



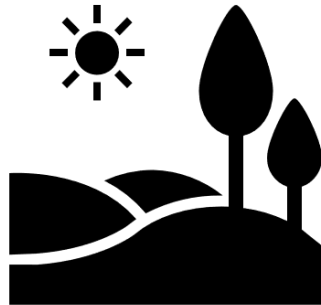
ie. "Common Pool Resources",  
Ostrom et al, 2006-2014



# One Solution:



Make  
communication easier  
for Land Stewards



# The 'research':

Design a **process** for communication and engagement for use with tacit knowledge systems using drone (UAV) technology



Specifically, to create communication materials that will strengthen ecosystem restoration and protection efforts within these two systems of expertise



The communication needs of Land Caretakers and Stewards that hold tacit systems of knowledge come in many shapes and sizes

*"I want to learn more about my piece of land and what is going on with it today, in real time"*

*"I am finding it is difficult to communicate to others about all the stuff that my land does for me"*

*"People often misunderstand me when I'm talking about my land"*

*"I think it would be so helpful for me to see my land from above, maybe with a plane or drone, but I feel limited by cost, ability, regulations, etc."*





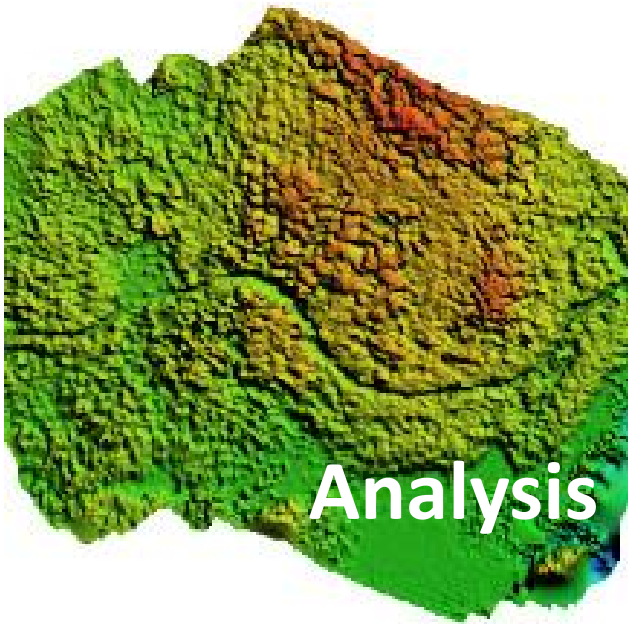
**UAV's**



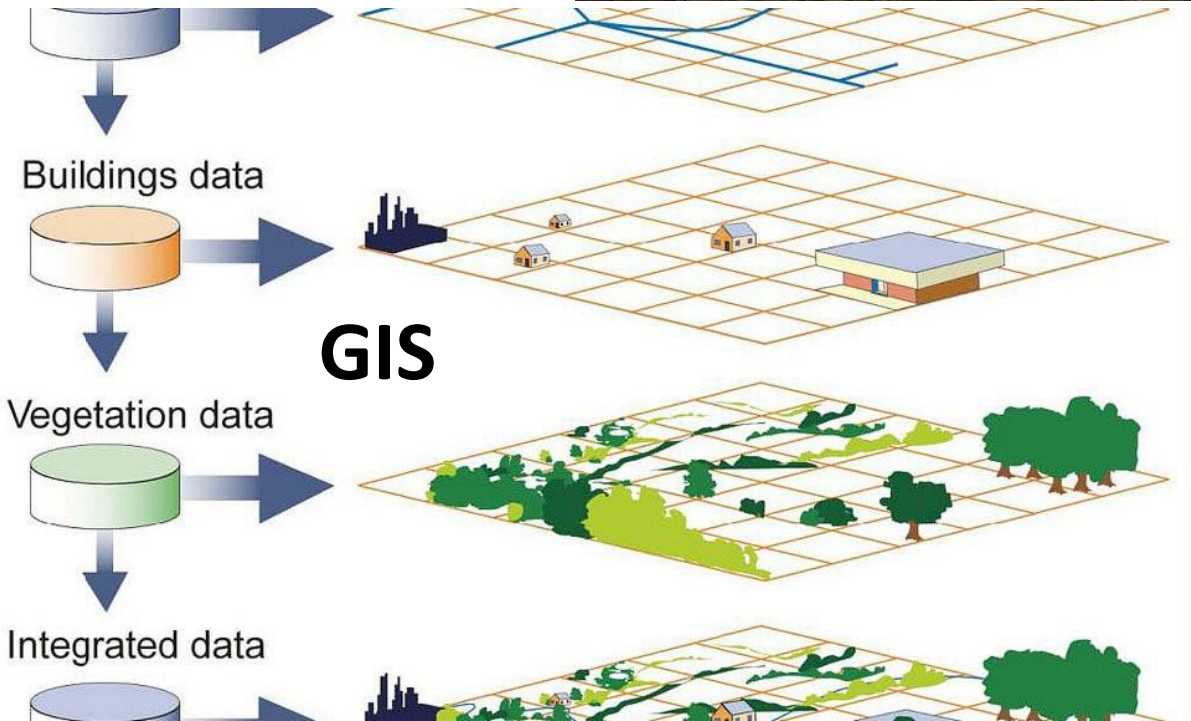
**UAV Imaging Sensors**



**Photogrammetry**



**Analysis**



The tools available for communicating unique knowledge about land also come in many shapes and sizes, including 'Drones'

- Drone = UAV = RPAS = UAS
- = Information Communication Technology
- Visual communications
- Spatial info, Photogrammetry, and Analysis
- Geographic Information Systems

An aerial photograph of a lush green valley. On the left, a dense forest of tall trees covers a ridge. The valley floor is filled with vibrant green terraced fields, likely tea or coffee, with distinct rows and paths. A small group of people is visible on a path in the middle of the valley. The overall scene is a beautiful, well-maintained agricultural landscape.

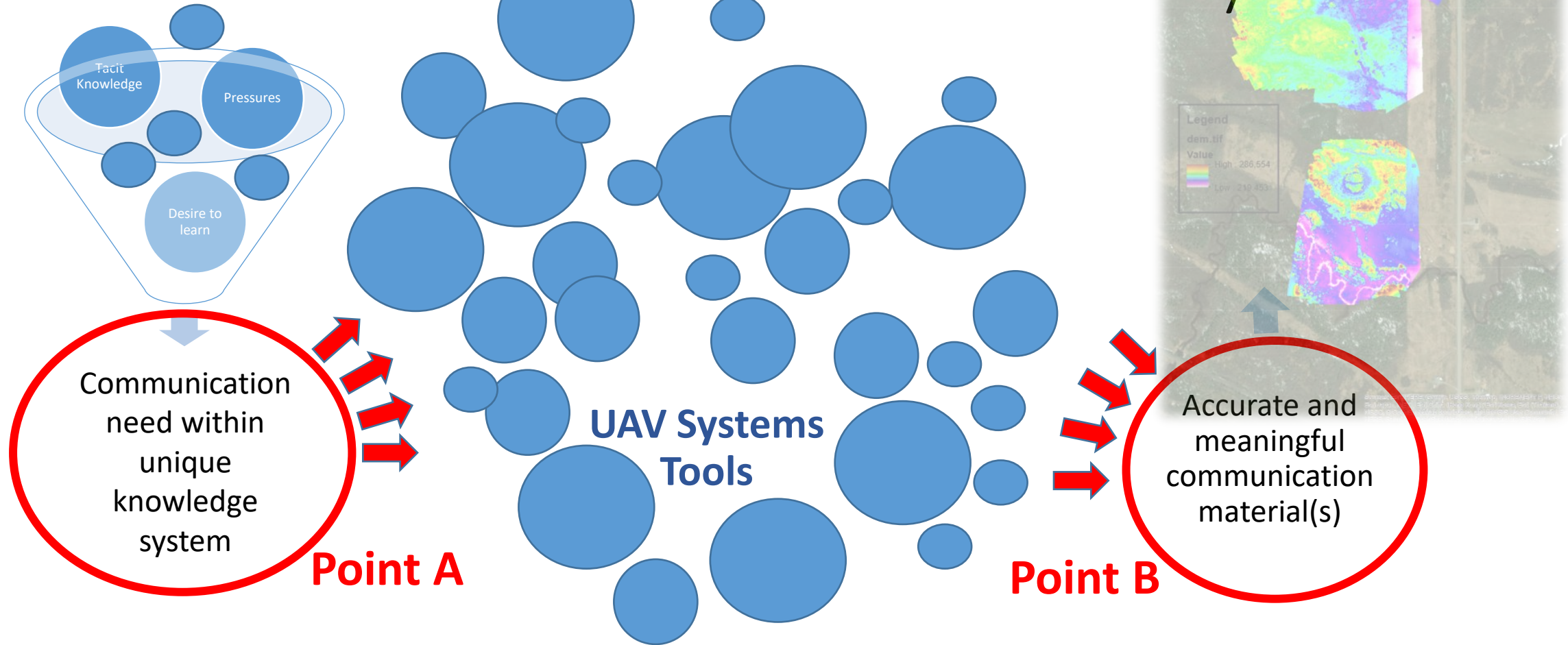
# Drone Ecology and beyond

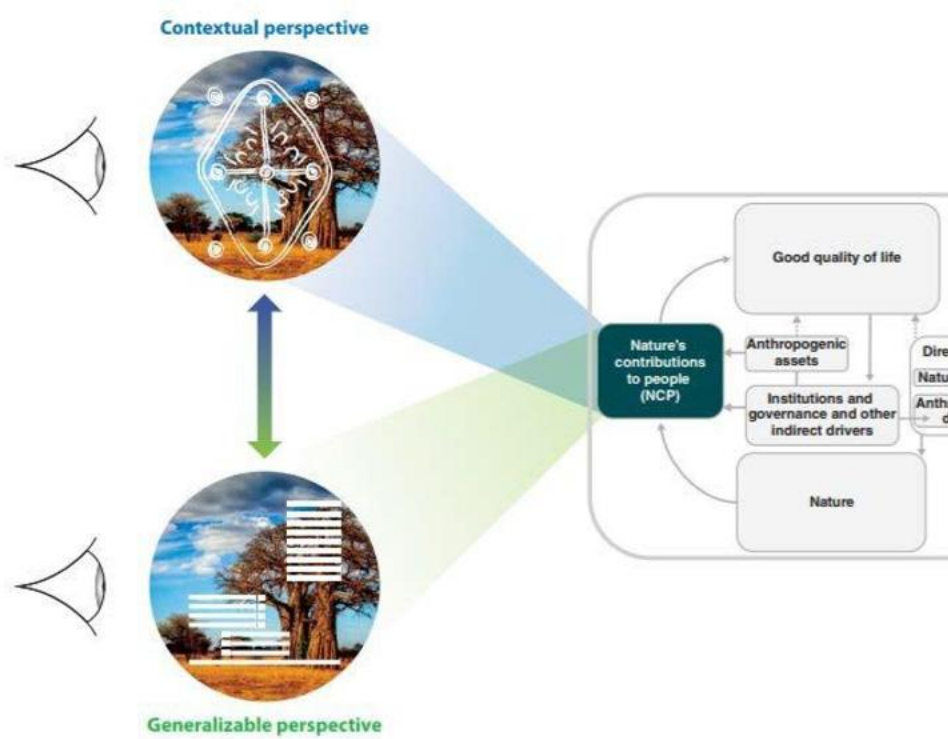
The use of drones to support restoration and protection efforts can currently be broken down into three (3) types or levels of applications

1. Simple Visual Imagery
2. General Analytics
3. Advanced analytics

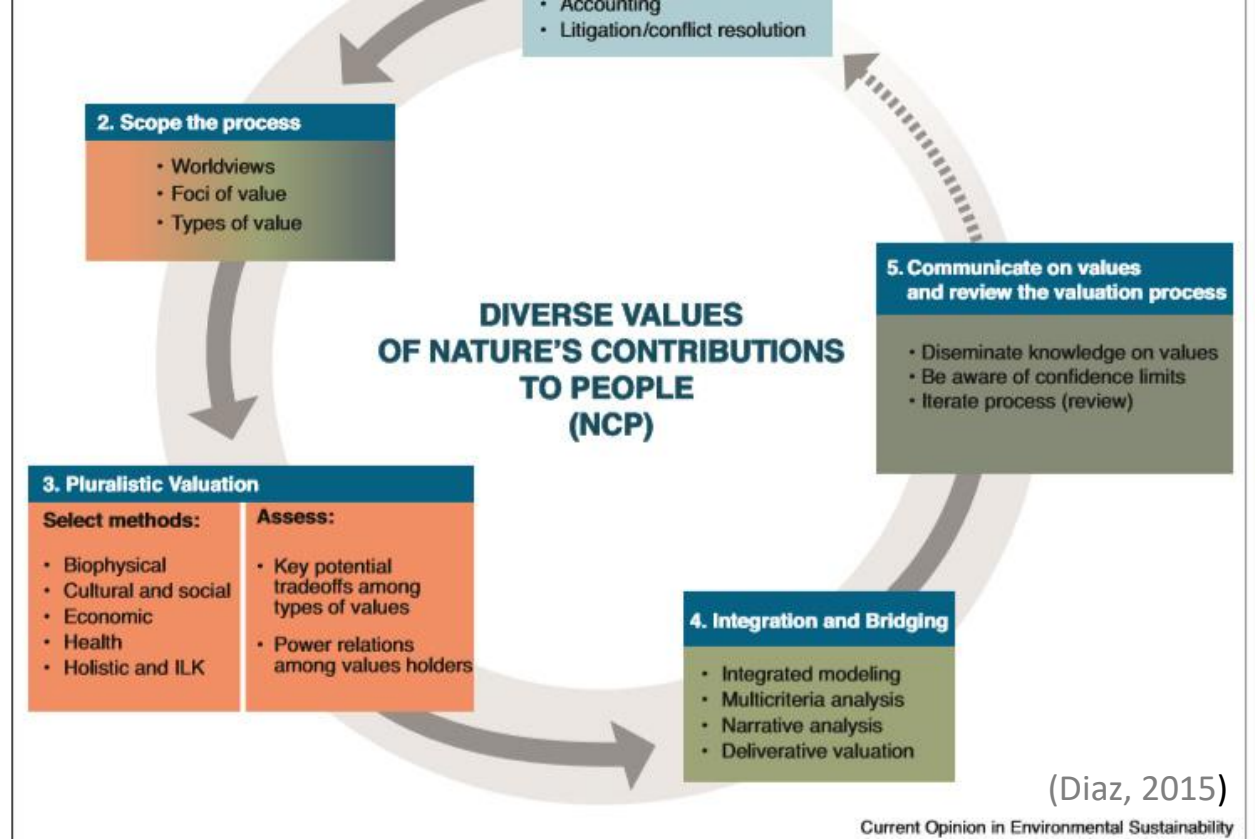
# The challenge behind the work:

Non-linearity



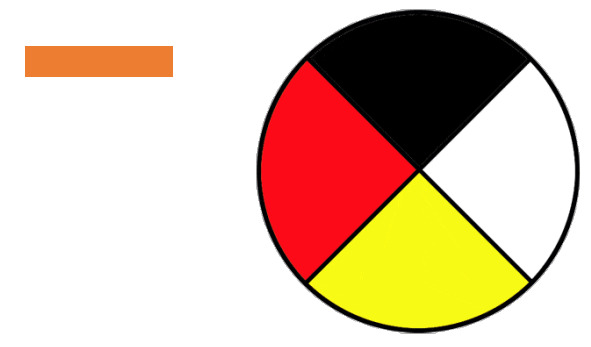
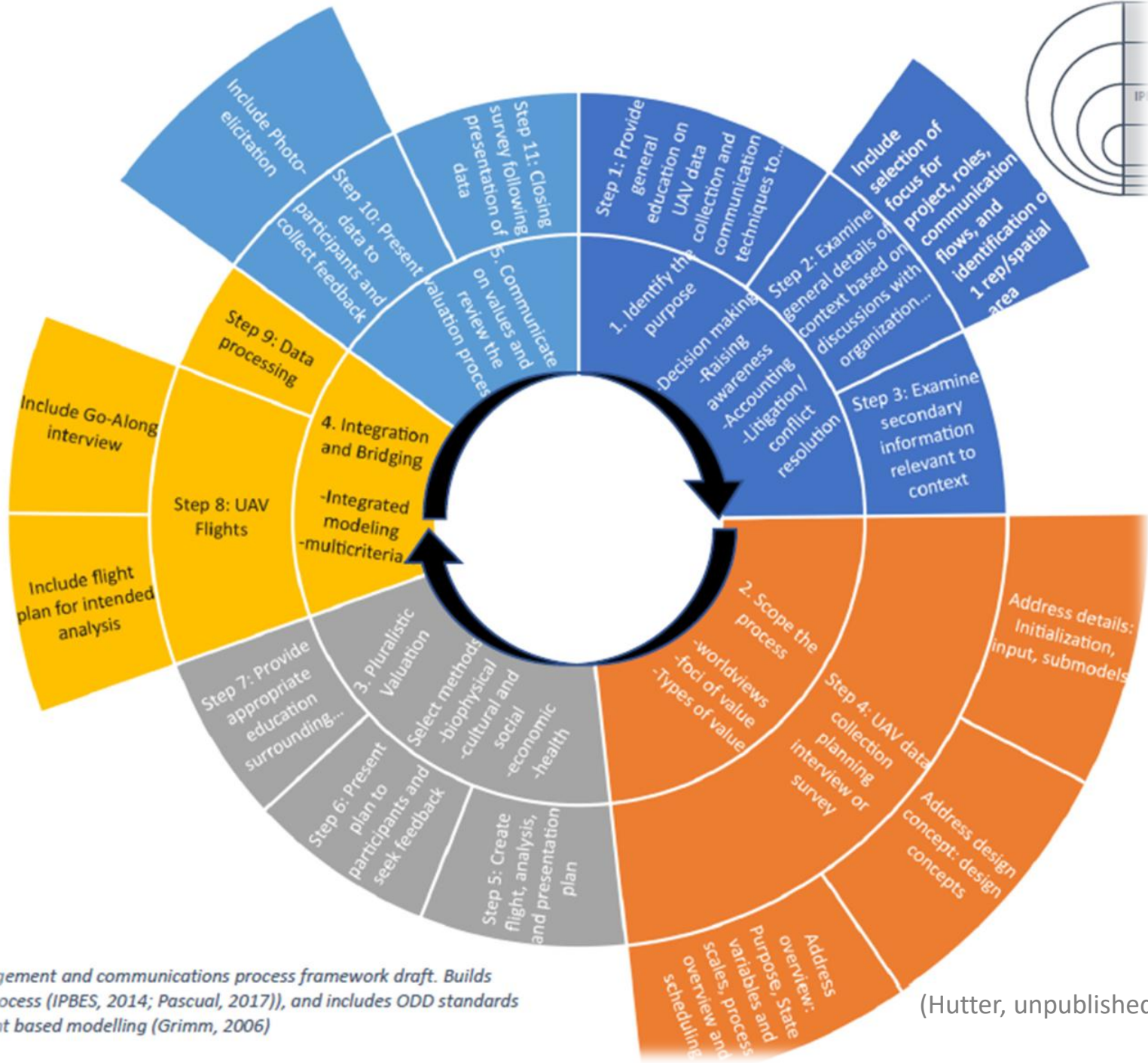


Two perspectives on nature's contributions to people (NCP)



Base of process for organizing available tools

- Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)
- Natures contributions to people (NCP) includes diversity of perspectives, knowledge bases, and worldviews



# Proposed process framework



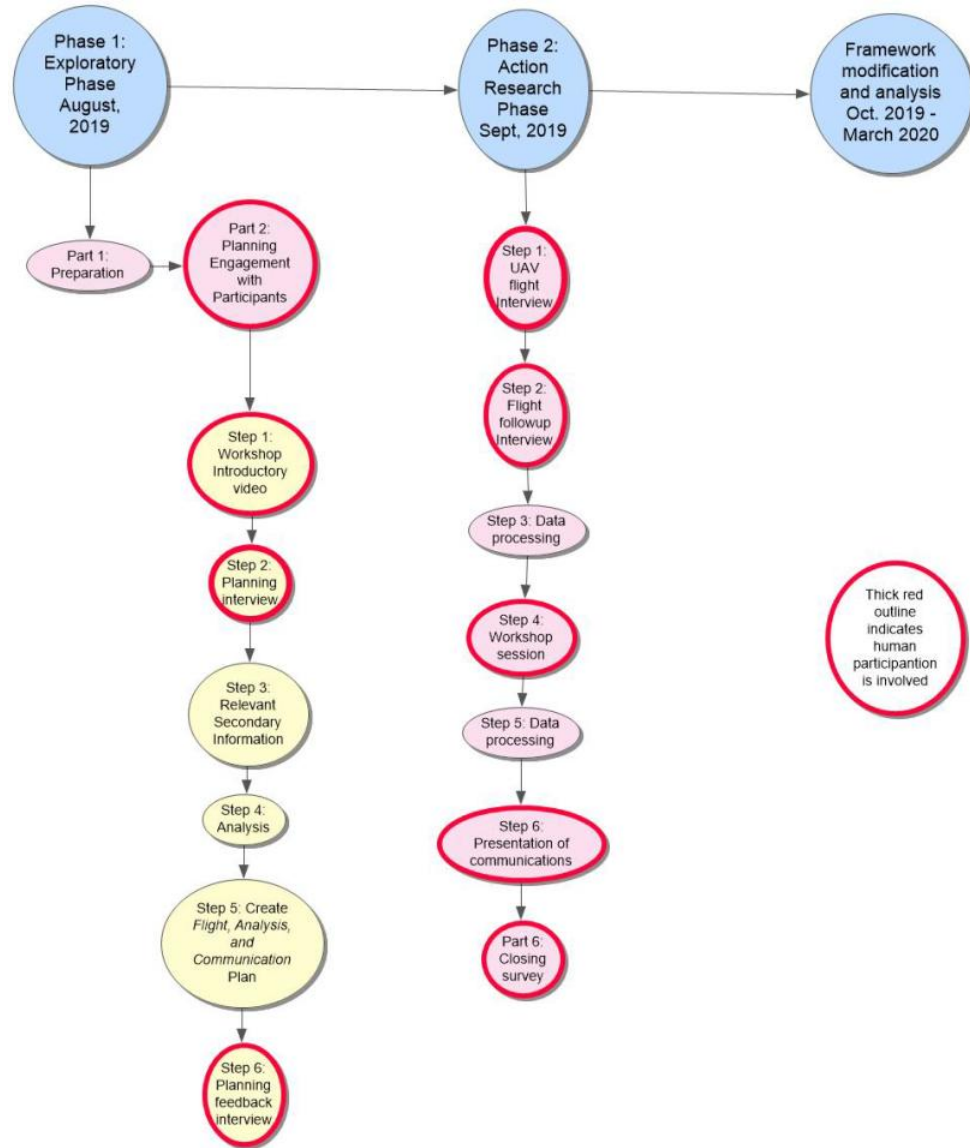
Management and communications process framework draft. Builds on existing process (IPBES, 2014; Pascual, 2017), and includes ODD standards and agent based modelling (Grimm, 2006)

(Hutter, unpublished)

Process is broken down into simple steps that are currently being explored and tested through interdisciplinary, applied research.

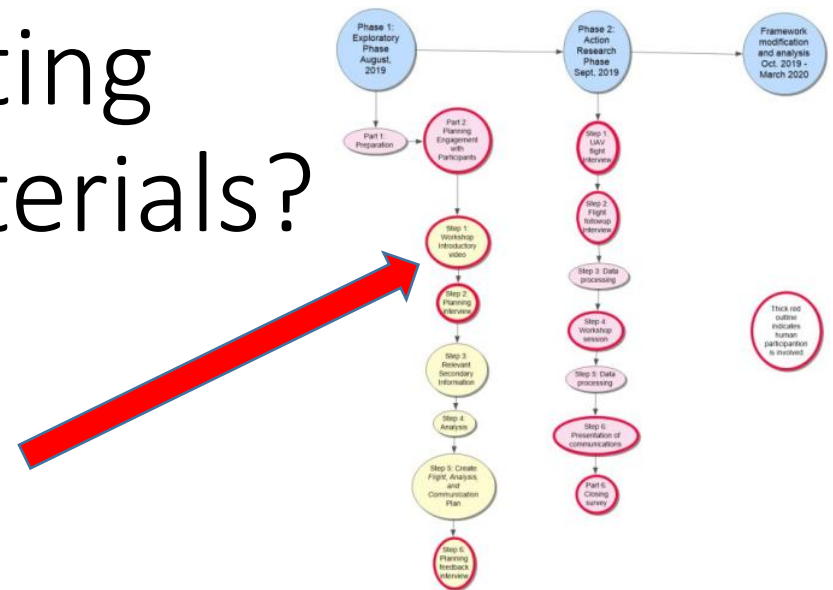
These steps are designed to make sure that

1. Knowledge is reciprocated between all sides
2. The process is guided by the needs of the land steward
3. Communication materials created have a purpose
4. Knowledge is able to be safely 'braided' together creatively through collaboration to strengthen the end goal – protection and restoration of ecosystems



Would you like to see an example of one step in the process for creating communication materials?

Step 1: Information video



WHITEFISH  
LAKES

MATACUEWAN  
72

566

101



# Video









# Why is this important for Conservation and Food Security?

If we are aiming to feed, house, and provide for 9 billion people someday, then 'other' knowledge systems, including the expertise of farmers themselves and the 'traditional' knowledge of Indigenous peoples MUST be given the space to be expressed, the opportunity to overcome limitations, and validation of its usefulness in its ability to protect and restore the services that our ecosystems provide.

# Thankyou

Amanda Hutter

MSc CDE University of Guelph

[huttera@uoguelph.ca](mailto:huttera@uoguelph.ca)

705-321-8327

Martin Millen

Independent UAV operator

Matachewan First Nation

[firestarter4812@yahoo.ca](mailto:firestarter4812@yahoo.ca)

705-288-5260

