

The ASU logo is mounted on a tall, light-colored rectangular monument. The logo consists of the letters 'ASU' in a bold, sans-serif font, with a stylized sunburst or fan shape behind the 'S'. The monument is set against a clear blue sky. In the background, there are green trees and a building with several white, dome-shaped structures on its roof.

ASU

## Five approaches to producing actionable science in conservation

Candice Carr Kelman, Chris Barton, Kyle Whitman, Simon Lhoest, Derrick Anderson, Leah Gerber

Conference « Study and conservation of wildlife in tropical and temperate ecosystems »  
Gembloux, November 7, 2022

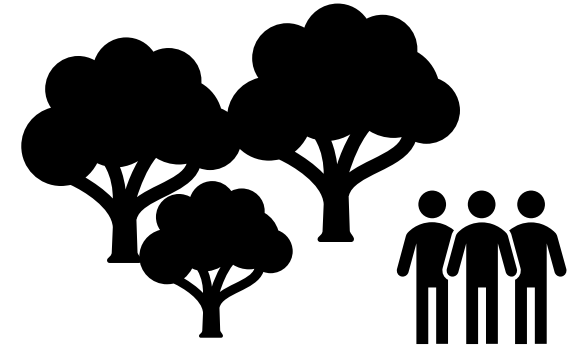
A large, dark grey stone monument stands in the foreground. The words 'ARIZONA STATE UNIVERSITY' are engraved in large, white, capital letters on the front face of the monument. The monument is surrounded by green grass and some small plants. In the background, there are more trees and a paved walkway.

ARIZONA  
STATE  
UNIVERSITY

**Scientists**



**Conservation practitioners**



'Basic' science

Use-inspired research

**Ideal co-production of knowledge**

Understudied models of demand-driven science

Science communication

Boundary spanning

**Supply-side dynamics**

**Demand-side dynamics**

**Step 1**

Interviews with engaged conservation scientists

**Step 3**

Knowledge partnerships scorecards

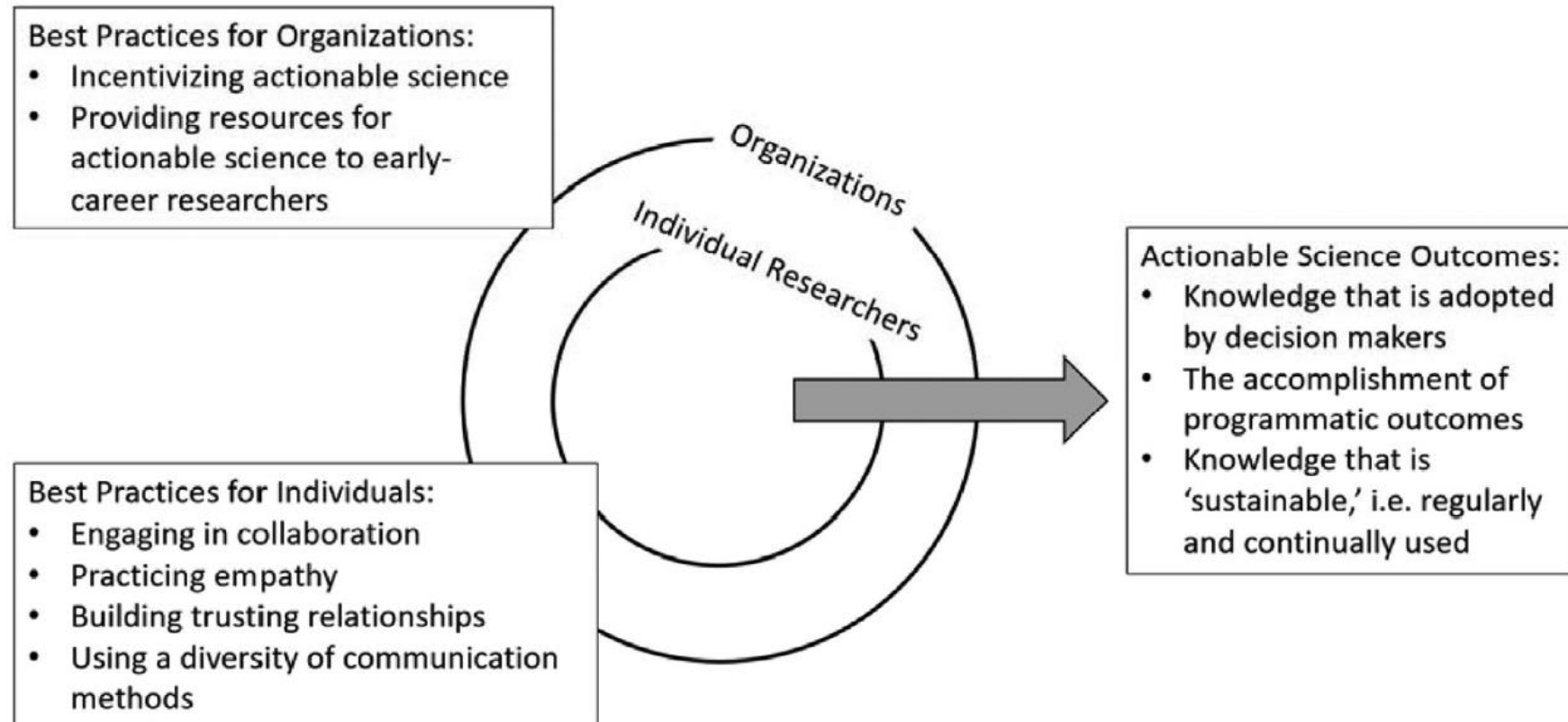
**Step 2**

Interviews with knowledge users

**How can we produce more actionable conservation science?  
How are conservation practitioners using science?**

## Producing actionable science in conservation: Best practices for organizations and individuals

Leah R. Gerber<sup>1</sup>  | Chris J. Barton<sup>1,2</sup>  | Samantha H. Cheng<sup>1,3</sup>  |  
Derrick Anderson<sup>1,4,5</sup>



**FIGURE 1** Best practices at the individual and organizational level and expected actionable science outcomes

# Conservation Biology

Candice Carr Kelman, Chris Barton, Kyle Whitman, Simon Lhoest, Derrick Anderson & Leah Gerber (accepted). Five approaches to producing actionable science in conservation, *Conservation Biology*.

Interview of 71 conservation scientists who had participated in one of three fellowship programs focused on leadership to become agents of change:

- Leopold Fellows
- Pew Fellows
- Wilberforce Fellows



General questions + specific questions about actionable science:

- **What do you do** to make your research more actionable?
- **What would you do differently** to make your research more actionable?
- Have you had **training / mentorship / experiences** that enhance your capacity to produce actionable science?
- What does your **institution / organization do to help you** produce actionable science?
- What are some **barriers from your institution/organization** to producing actionable science?
- Do you **work with others** to make your research more actionable?
- Who in your field is doing **exemplary work**?

## 16 activities of action-oriented scientists:

1. Focus on real-world impacts 
2. Science communication to the public, policymakers, and other scientists 
3. Building agency / capacity / knowledge 
4. Focus on user needs 
5. Networking & building relationships 
6. Boundary spanning 
7. Creating long-standing partnerships with managers 
8. Collaborative interdisciplinary / transdisciplinary research 
9. Involving intended users in design of research & research questions 
10. Involvement in management / policy / action forums 
11. Strategic planning 
12. Deep listening / understanding 
13. Early engagement of stakeholders / end users of science 
14. Co-production of research questions, process, and results of value to both science and policy
15. Face-to-face interaction 
16. Open access / open-source data or findings 



## 3 Nested levels of actions: Why, How, What

Level of activity	Themes
<p><b>Why</b> respondents pursued actionable science:</p> <p style="text-align: center; font-weight: bold; margin: 10px 0;">Motivations</p> <p style="text-align: center;">(Values / Overall intended outcomes / Goals of research activity)</p>	<p>Focus on real-world impacts </p> <p>Building agency / capacity / knowledge </p>
<p><b>How</b> respondents pursued actionable science :</p> <p style="text-align: center; font-weight: bold; margin: 10px 0;">Strategies</p>	<p>Science communication </p> <p>Boundary spanning </p> <p>Creating long-standing partnerships with managers </p> <p>Collaborative inter/transdisciplinary research </p> <p>Involvement in management / policy / action forums </p> <p>Co-production </p>
<p><b>What</b> respondents did to pursue actionable science:</p> <p style="text-align: center; font-weight: bold; margin: 10px 0;">Tactics</p> <p style="text-align: center;">(Specific behaviors &amp; skills)</p>	<p>Focus on user needs </p> <p>Networking and building relationships </p> <p>Involving intended users in design of research </p> <p>Early engagement of stakeholders </p> <p>Strategic planning </p> <p>Deep listening / understanding </p> <p>Face-to-face interaction </p> <p>Open access / open-source data or findings </p>

	Real-world impact	Building capacity	Science communication	Boundary spanning	Partnerships	Collaborative research	Action forum	Co-production	Use-inspired research	Networking	Involving users in design	Early engagement	Strategic Planning	Deep listening	Face-to-face	Open access
Real-world impact	1															
Building capacity	0.32	1														
Science communication	0.09	0.09	1													
Boundary spanning	0.36	0.4	-0.1	1												
Partnerships	0.28	0.29	-0.02	0.53	1											
Collaborative research	0.26	0.12	0.04	0.32	0.1	1										
Action forum	0.24	0.23	0.18	0.15	0.15	0.08	1									
Co-production	0.26	0.27	-0.08	0.51	0.52	0.31	0.23	1								
Use-inspired research	0.43	0.49	0.04	0.56	0.35	0.31	0.03	0.49	1							
Networking	0.52	0.49	0.04	0.44	0.41	0.25	-0.03	0.37	0.57	1						
Involving users in design	0.33	0.3	-0.06	0.62	0.49	0.37	0.13	0.72	0.63	0.51	1					
Early engagement	0.28	0.24	-0.21	0.63	0.47	0.28	0.03	0.59	0.54	0.48	0.68	1				
Strategic Planning	0.24	0.3	-0.06	0.39	0.44	0.2	0.13	0.48	0.45	0.27	0.48	0.62	1			
Deep listening	0.31	0.28	-0.17	0.63	0.5	0.25	0.01	0.39	0.47	0.53	0.54	0.73	0.48	1		
Face-to-face	0.17	-0.13	-0.14	0.16	0.17	0.2	-0.08	0.1	0.25	0.1	0.15	0.14	0.15	0.25	1	
Open access	-0.24	-0.11	0.15	-0.1	-0.28	0.08	0.02	-0.16	-0.07	-0.25	-0.07	-0.19	-0.07	-0.22	-0.17	1

## Co-occurrence matrix

- ➔ Some activities are strongly correlated
- ➔ Most correlations are **positive**, some are **negative**

# 5 levels of engagement in actionable science

## 1) The Disclosers

Doesn't involve engagement

## 2) The Educators

One-way information flow

## 3) The Networkers

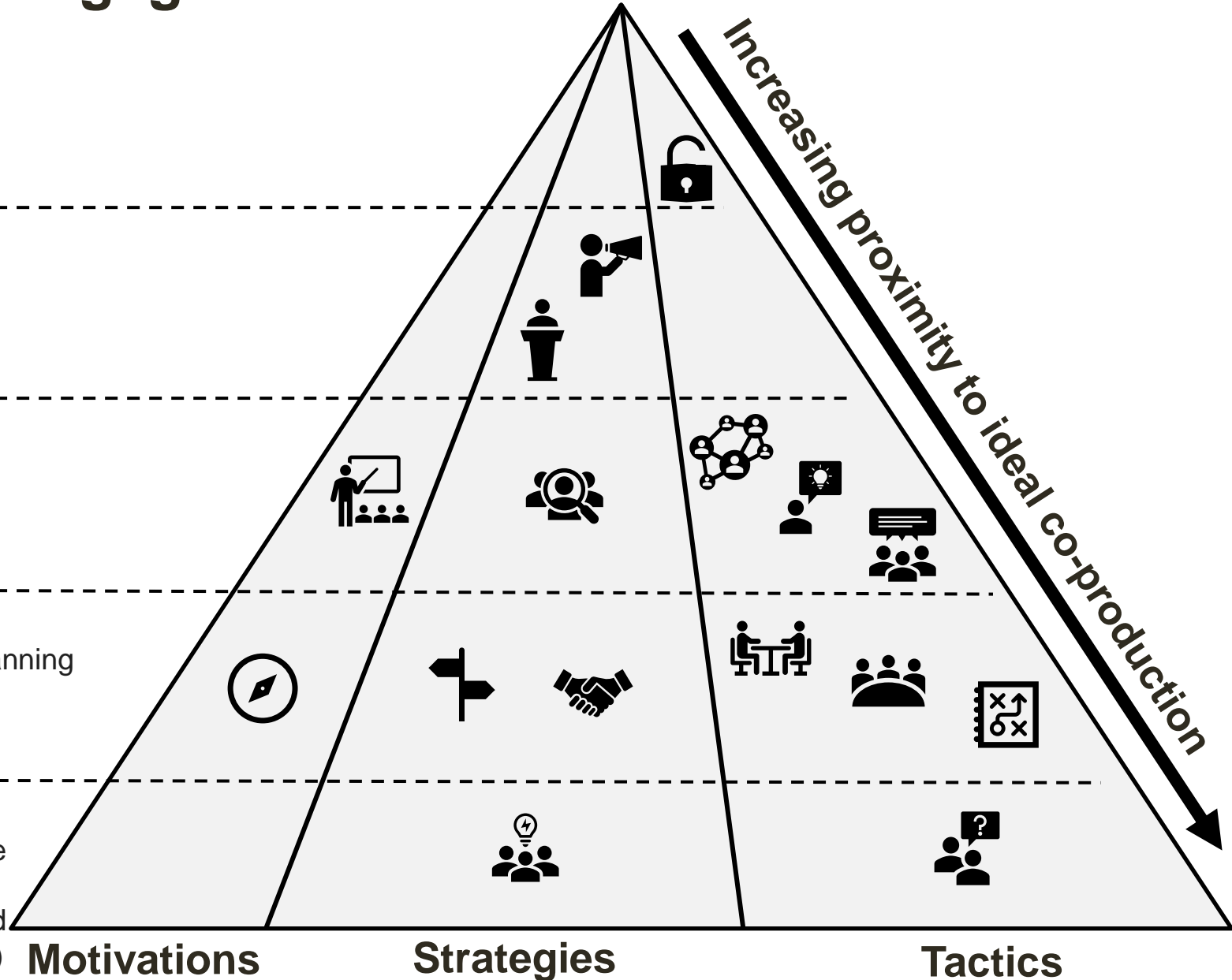
Two-way information flow;  
Specific user groups

## 4) The Collaborators

Engage in long-term, boundary-spanning  
knowledge partnerships

## 5) The Pluralists

Coproduction requires that value be  
produced for – and by – both  
knowledge users (practitioners) and  
knowledge producers (researchers)





## The Disclosers

- Publish papers in open access / open-source data
- Generally, only engage in this activity
- Science outreach and engagement with conservation practitioners is still needed

**The Educators**

= **The Disclosers**

- + Engage in science communication: public, policymakers, other scientists (**one-way information flow**)
- + Framing and tailoring scientific findings to fit communication methods, formats, and sources that are most likely to effectively reach desired audiences
- + Not related to any other activity (strategy itself)

**The Networkers**

= **The Educators**

- + Desire to build agency and capacity in others
- + Engage in use-inspired and stakeholder-engaged research (**two-way information flow**)
- + Asking questions about who will be using their research, and attempting to reach out to these groups

## The Collaborators

### = The Networkers

- + Focus on real-world impacts and capacity building
- + Aim to connect with knowledge users, identify their needs, and produce knowledge that meets these needs, by engaging all stakeholders in the overall research process
- + Engage in long-term, boundary-spanning\* knowledge partnerships
- + Empathy and willingness to learn

\*Boundary-spanning = intense activity that requires specific skill sets: deep listening, understanding of the science, ability to recognize and control for power differentials among all parties involved, navigating the incentives and information needs of various stakeholders

## The Pluralists

### = The Collaborators

- + Engage in knowledge coproduction: value is produced for – and by – both knowledge users (practitioners) and knowledge producers (researchers)
- + Transparency on what is being produced for whom and why
- + Early engagement of stakeholders and involvement of the intended users in the design of research projects
- + Dynamic processes and **multidirectional information flows**
- + Strategic planning, patience and persistence, to set common agendas and collective goals
- + Communication, deep engagement, co-defining research questions and project co-leadership

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# *Which actionable science type are you?*

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**The Pluralist**

**The Collaborator**

**The Networker**

**The Educator**

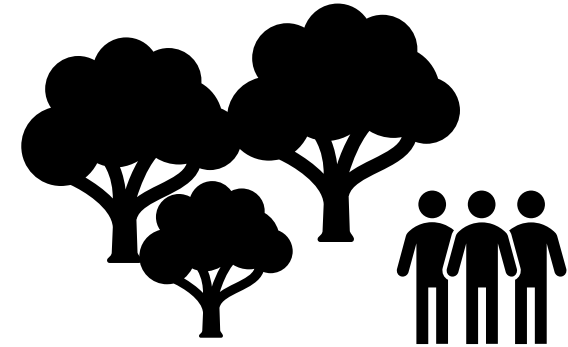
**The Discloser**



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Leah Gerber

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Paola Sangolquí

Martha Arízaga

The ASU logo, consisting of the letters 'ASU' in a stylized, bold font with a sunburst design behind the 'S', mounted on a tall, narrow, light-colored stone pillar.

Thank you  
for your  
attention!

A large, dark stone monument with the words 'ARIZONA STATE UNIVERSITY' engraved in white, capital letters. The monument is set against a background of green trees and a clear blue sky.

My e-mail: [Simon.Lhoest@uliege.be](mailto:Simon.Lhoest@uliege.be)

Our website and publications: <https://sites.google.com/asu.edu/actionablesoci/home>