

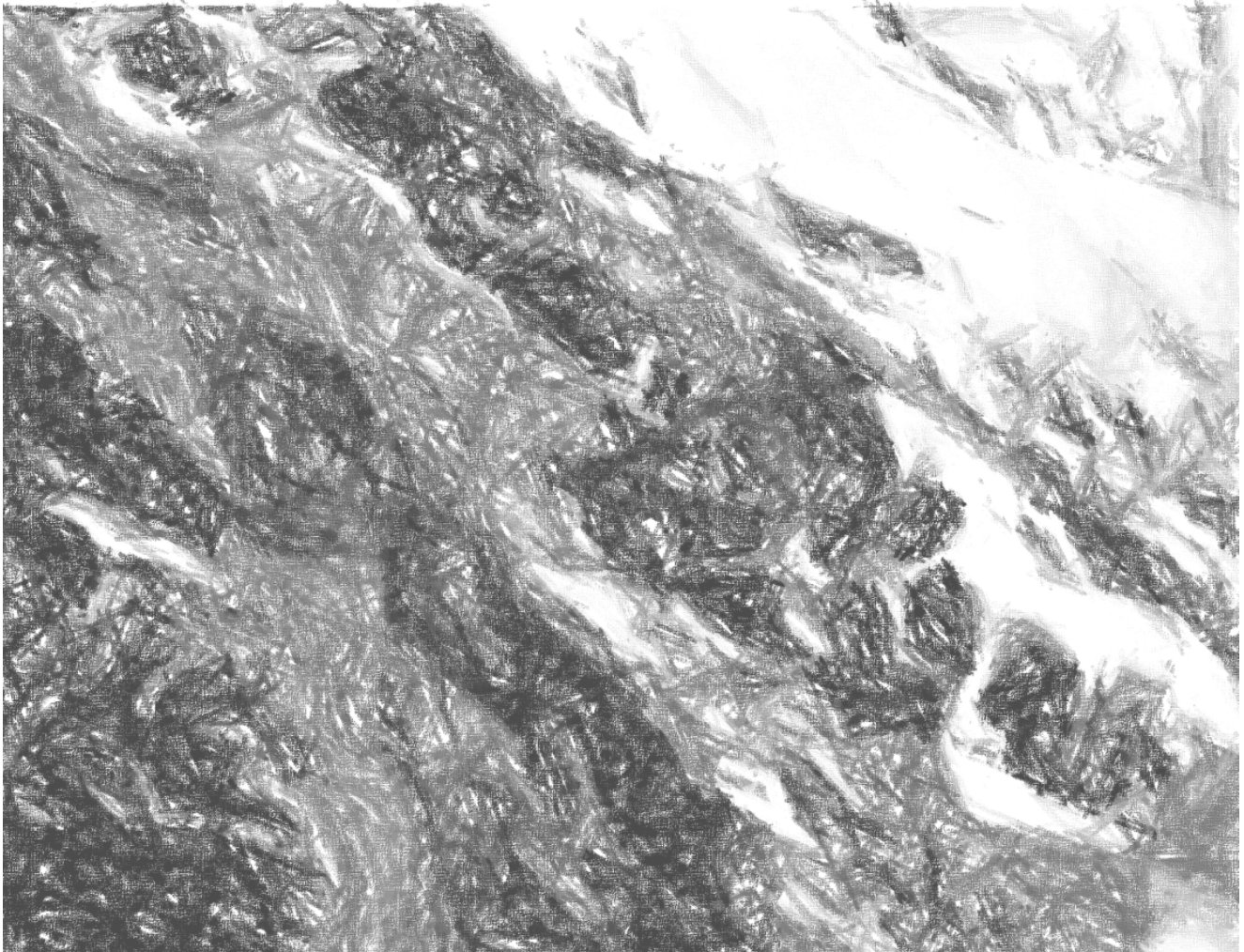
# **Center for Conservation Innovation**

Strategic Plan  
2019-2024



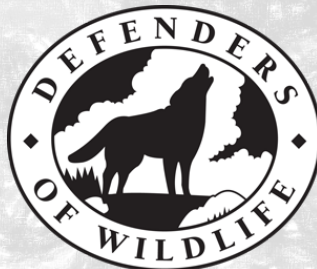






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***On the cover:*** A artistic-filtered rendering of a map of a Mojave desert tortoise connectivity model.

## Our Vision for 2024

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In 2024, the human population will have surpassed eight billion people, millions of additional acres of natural habitat will have been degraded or lost, and too many species will have been pushed to the brink of existence. There will continue to be a pressing need for effective conservation advocates who work to sustain biodiversity in the face of ongoing habitat loss, overexploitation of wild species, climate change, and other threats.

In 2024, we envision the Center for Conservation Innovation (CCI) as a widely known go-to team of scientists, technologists, and policy experts who find creative and practical solutions for conservation. We envision an evolved landscape of conservation, where:

- Science is once again central to decision-making at all levels of conservation implementation, in and out of government;
- Federal wildlife agencies have made significant strides in updating the technology they use in their day-to-day work;
- Local, state, and federal agencies have begun to embrace new policies to improve conservation outcomes;
- The private sector is more proactive with conservation, taking concrete steps to reduce the impact of their activities; and
- The next generation of conservationists is training to take the reins.

In 2024—as today—CCI won't be doing this work alone. Defenders of Wildlife will have passed our 75th year of working for the protection and conservation of species and their habitats. In these next five years, we will collaborate with Conservation Law to ensure the most up-to-date science is used to support Defenders' legal work. The GIS team will be providing Government Relations with maps to share with lawmakers on Capitol Hill. And we will have connected people from Field Conservation and Landscape Conservation with scientists across North America to ensure we have the science capacity to make the best conservation decisions.

To make our vision a reality, we need a plan to guide our work. This is that plan.

## Goals and Strategies

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**In the Center for Conservation Innovation (CCI), we work at the intersection of science, technology, and policy to find creative, pragmatic solutions for conservation.** Here we articulate two goals and eleven strategies to guide our work over the next five years. These goals and strategies are natural extensions of those in the Defenders of Wildlife *Strategic Plan, 2019-2028* (<http://bit.ly/DOW-strategic-plan>).

### CCI Goal 1

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*Advance science, technology, and policy to improve conservation outcomes.*

#### Strategies

1. Lead program-level applied scientific research.
  2. Develop and apply emerging technologies to enable or improve conservation actions.
  3. Draft and advocate for improved conservation laws, policies, and procedures.
  4. Engage and collaborate on cross-domain science, technology, and policy with conservation implications.
  5. Broaden the target audience of our work among decision makers in and out of government.
  6. Raise our external profile to establish and reinforce CCI's and Defenders' leadership.
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### CCI Goal 2

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*Ensure Defenders has the science, technology, and policy capacity necessary to be maximally effective.*

#### Strategies

1. Provide general scientific guidance to support Defenders' mission.
  2. Provide geospatial science products and analyses.
  3. Expand internal science, technology, and policy capacity.
  4. Expand Defenders' external support network in science, technology, and policy.
  5. Develop processes for monitoring and evaluating Defenders' work.
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## Defenders Goal 1

*Conserve and restore imperiled biodiversity in North America.*

### Strategies

1. Defend and restore wildlife conservation protections and policies.
2. Secure new wildlife conservation initiatives, policies and laws.
3. Ensure adoption of effective climate change policies and practices to conserve wildlife.
4. Mobilize science and technology to advance wildlife conservation.
5. Lead wildlife conservation on the ground.
6. Ensure adequate public and private funding for wildlife conservation.

## Defenders Goal 2

*Mobilize a broader constituency for wildlife conservation.*

### Strategies

1. Mobilize members and supporters.
2. Engage new audiences.
3. Expand partnerships.
4. Diversify our workforce and foster a culture of inclusivity.

*CCI's Goals and Strategies (left) overlap with all of Defenders' Goals and Strategies (top). Each blue dot indicates a direct relationship between the work of CCI and Defenders more broadly.*





*We perform research and technology development to monitor habitat protection, which informs policy development. These images (after left, before right) are from the site of an HCP in Georgia that we analyzed for indigo snakes.*



## Step-down Actions

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To make our goals and strategies more concrete we lay out step-down actions below. Each action is assigned to a single goal and strategy combination even though multiple assignment may be possible. To organize the actions across our focal themes, we estimate the relative contribution of science (**S**), technology (**T**), and policy (**P**) work to each action.

### Goal 1, Strategy 1

**Lead program-level applied scientific research.**

Title	Description	S/T/P
Lead implementation research	Lead research into how laws, policies, and practices are carried out, from the ESA to coexistence.	65/10/25
Lead monitoring research	Lead research into how to improve the effectiveness and efficiency of conservation program monitoring.	70/15/15
Lead statistical research	Lead research into new statistical tools for conservation measuring and monitoring.	75/20/5
Lead effectiveness research	Lead research into the effectiveness of conservation actions at multiple scales.	75/10/15
Lead prediction research	Lead research into predicting threats and opportunities for conservation.	75/10/15

**Goal 1, Strategy 2**

***Develop and apply emerging technologies to enable or improve conservation actions.***

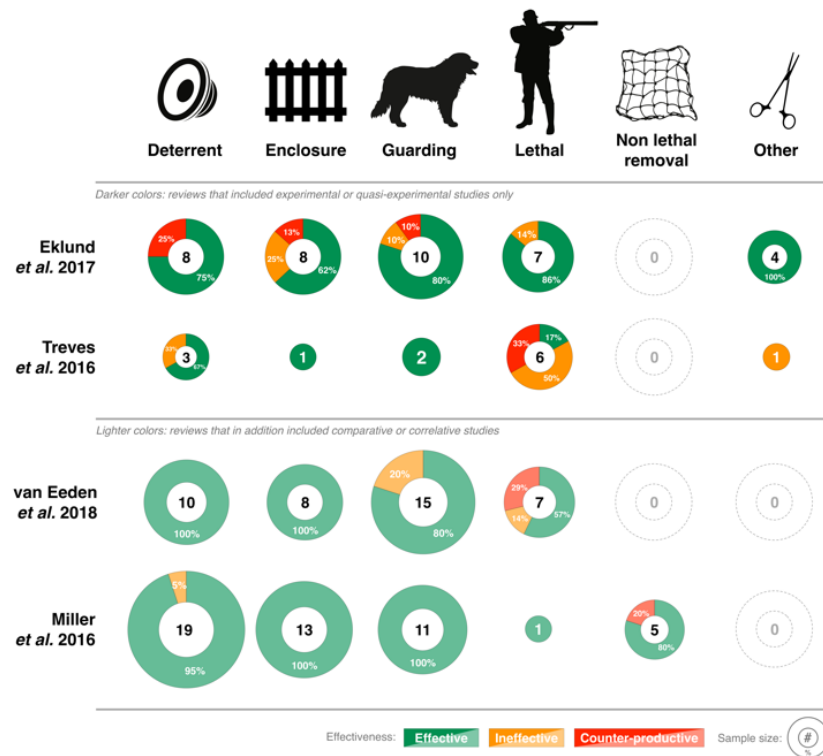
<b>Title</b>	<b>Description</b>	<b>S/T/P</b>
Develop tech for practitioners	Create technology tools to improve the efficiency and effectiveness of conservation practitioners carrying out their work.	10/75/15
Develop tech for lay audiences	Create technology tools that communicate conservation needs and success to lay audiences.	10/85/5
Develop tech for predictions	Create technologies to make it easier to predict future conditions and threats, from landscapes to human-wildlife conflict.	10/80/10
Develop tech for retrospective analyses	Create technologies that enable retrospective analyses of conservation data, from satellites to administrative data.	10/75/15
Develop general tech	Contribute advances back to the broader technology community.	10/90/0

### Goal 1, Strategy 3

***Draft and advocate for improved conservation laws, policies, and procedures.***

Title	Description	S/T/P
Pursue general conservation policies	Develop, help defend, and advocate for strong general conservation policies, both existing and new.	10/10/80
Pursue planning policies	Develop, help defend, and advocate for strong conservation planning policies, both existing and new.	10/5/85
Pursue implementation policies	Develop, help defend, and advocate for strong conservation implementation policies and practices, both existing and new.	10/10/80
Pursue monitoring policies	Develop, help defend, and advocate for strong conservation monitoring policies, both existing and new.	10/10/80
Integrate new science and tech into policies	Ensure that new science and technologies are brought to bear on the development and implementation of conservation policies.	20/20/60

*We review literature to learn how best to address fundamental challenges like human-wildlife conflict. This figure shows the effectiveness of different measures as summarized in four meta-analyses.*



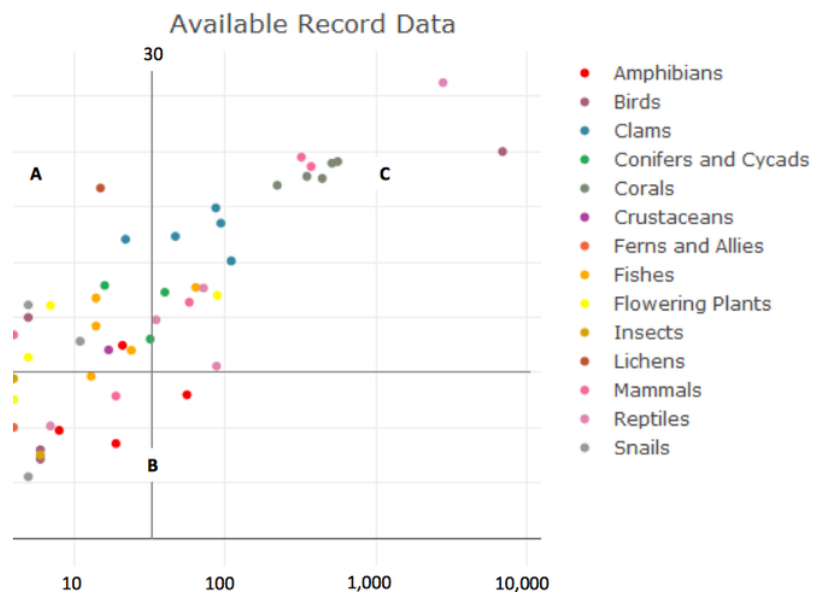


## Goal 1, Strategy 4

**Engage and collaborate on cross-domain science, technology, and policy with conservation implications.**

Title	Description	S/T/P
Incorporate social sciences	Work with environmental psychologists, conflict managers, and others to more fully incorporate social sciences into conservation.	30/20/50
Incorporate environmental justice	Integrate environmental justice into our program and advocate for agencies and others to do the same.	30/10/60
Integrate with agriculture R&D	Work with researchers and developers in agriculture to identify and pursue new solutions that advance conservation.	40/20/40
Integrate with infrastructure planning	Work with infrastructure planners and engineers to identify challenges and solutions to conservation.	25/25/50
Integrate with ecosystems services science	Work with researchers and practitioners to integrate ecosystem service science into our wildlife conservation advocacy.	40/10/50
Advance conservation robotics	Work with engineers to identify where robotics development can advance conservation.	25/65/10

We find and analyze data from across taxonomic groups and domains of research to find novel patterns. Here we found a strong relationship between range size and available data.



**Goal 1, Strategy 5**

***Broaden the target audience of our work among decision makers in and out of government.***

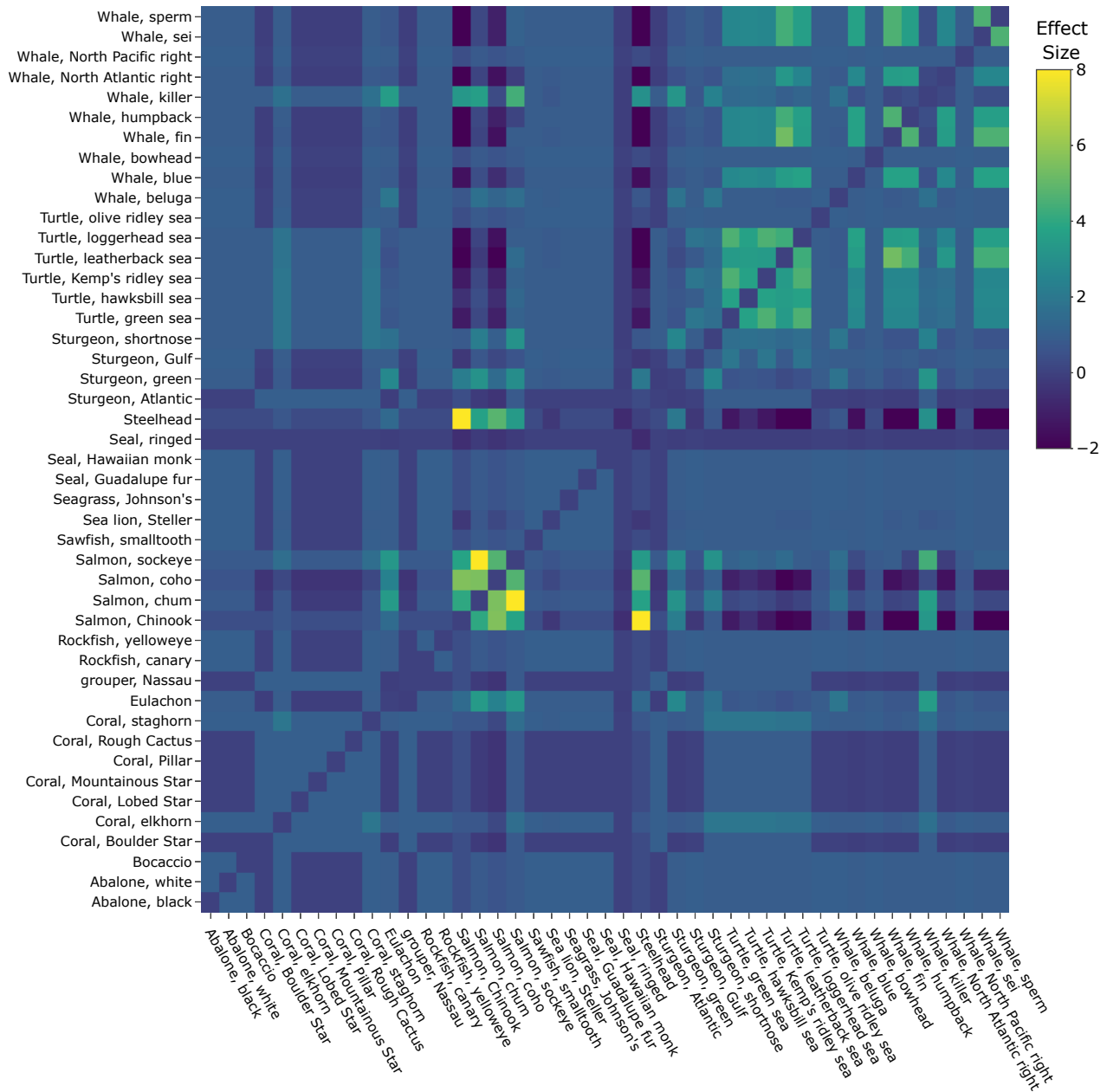
<b>Title</b>	<b>Description</b>	<b>S/T/P</b>
Engage high-impact agencies	Work more directly with high consulting, high conservation impact federal agencies or departments, such as Army Corps of Engineers and Department of Transportation.	10/10/80
Engage states and counties	Work with states, including wildlife and other agencies, and county groups to identify opportunities for collaborations.	10/40/50
Engage the private sector	Work more directly with large conservation-effect private sector domains, including agriculture, developers, and transportation.	10/45/45
Engage technology sector	Work actively with the technology sector to identify scalable solutions for conservation applications.	10/70/20
Engage international organizations	Work directly with international organizations to expand capacity and effectiveness.	25/25/50
Engage human health agencies	Work more directly with federal agencies whose human dimensions missions overlap with conservation, such as the Department of Health and Human Services.	30/30/40

**Goal 1, Strategy 6**

***Raise our external profile to establish and reinforce CCI's and Defenders' leadership.***

<b>Title</b>	<b>Description</b>	<b>S/T/P</b>
Host informational seminars	The CCI Seminar Series highlights new and diverse research and ideas to expand thinking about conservation, and we invite people from outside Defenders to join in the talks.	33/33/33
Promote our work in media	Provide media interviews, write blogs and op-eds, engage on social media, and other promotional strategies, and integrate media in our work.	33/33/33
Lead community discussion and action	Organize community workshops to promote discussions and action on conservation challenges.	50/25/25
Engage Science Advisors as ambassadors	Ensure regular contact and engagement with Science Advisors in roles where they are ambassadors for Defenders and conservation.	66/0/33
Integrate with community science programs	Develop new ways to engage the public in conservation through community science.	50/30/20
Shape published science	Serve as peer-reviewers and on editorial boards of scientific journals.	50/30/20
Join tech competitions	Submit web applications and other technology products to national competitions and showcases.	10/90/0





We analyze data on laws like the Endangered Species Act to uncover the reality of implementation. This shows certain combinations of species are more likely to be harmed at the same time than other combinations.

**Goal 2, Strategy 1*****Serve the general science needs of Defenders.***

<b>Title</b>	<b>Description</b>	<b>S/T/P</b>
Provide science service	Provide scientific guidance, syntheses and reviews for comment letters, legislation, sign-on letters, legal cases, publications, and other purposes.	90/0/10
Provide communications science reviews	Review scientific language in marketing and communications materials.	90/0/10
Support scientific analyses	Assist and conduct data analysis to inform decision-making and for research and publications.	90/10/0
Curate scientific resources	Create a central repository for open source scientific and technical articles on conservation across Defenders' work.	60/20/20

**Goal 2, Strategy 2*****Serve the geospatial science needs of Defenders.***

<b>Title</b>	<b>Description</b>	<b>S/T/P</b>
Provide mapping service	Conduct spatial analyses and develop static and interactive map products to support and promote outreach and communications.	33/33/33
Provide programmatic geospatial integration	Monitor and evaluate project-level opportunities of Defenders that have yet to leverage emerging geospatial technology.	33/33/33
Build geospatial personnel capacity	Provide technical support and training to geospatial product developers and end users.	50/50/0
Curate geospatial data resources	Develop and maintain a centralized collection of conservation-based spatial datasets for shared use.	50/50/0
Improve GIS data accessibility	Advocate the use and distribution of free and easy-to-use data viewers to improve accessibility and advocacy.	20/80/0

**Goal 2, Strategy 3*****Expand internal science, technology, and policy capacity.***

<b>Title</b>	<b>Description</b>	<b>S/T/P</b>
Advance personnel capacity	Mentor staff and interns on science, technology, and policy methodologies and writing.	33/33/33
Cultivate CCI Affiliates	Develop the CCI Affiliates program to link all departments and offices more directly to our work.	33/33/33
CCI internship program	Recruit and mentor interns to build future capacity for conservation and to help fill current gaps.	33/33/33
Create a CCI fellowship program	Develop and implement a paid fellowship program for fellows at multiple career levels.	33/33/33

**Goal 2, Strategy 4*****Expand the external support network for Defenders' science, technology, and policy capacity.***

<b>Title</b>	<b>Description</b>	<b>S/T/P</b>
Build a "Next-generation Advisors" network	Cultivate a network of emerging scientists, technologists, and policy specialists to help advise CCI and Defenders.	80/0/20
Build computing capacity for Defenders	Expand technical computing infrastructure to meet the needs of CCI and others across Defenders.	40/50/10
Build the Science Advisor network	Recruit, nurture, and integrate Defenders' Science Advisors into project work and external networking.	65/15/20
Develop an external affiliates program	Expand the CCI Affiliates program to include select researchers and practitioners from outside the organization.	33/33/33



**Goal 2, Strategy 5**

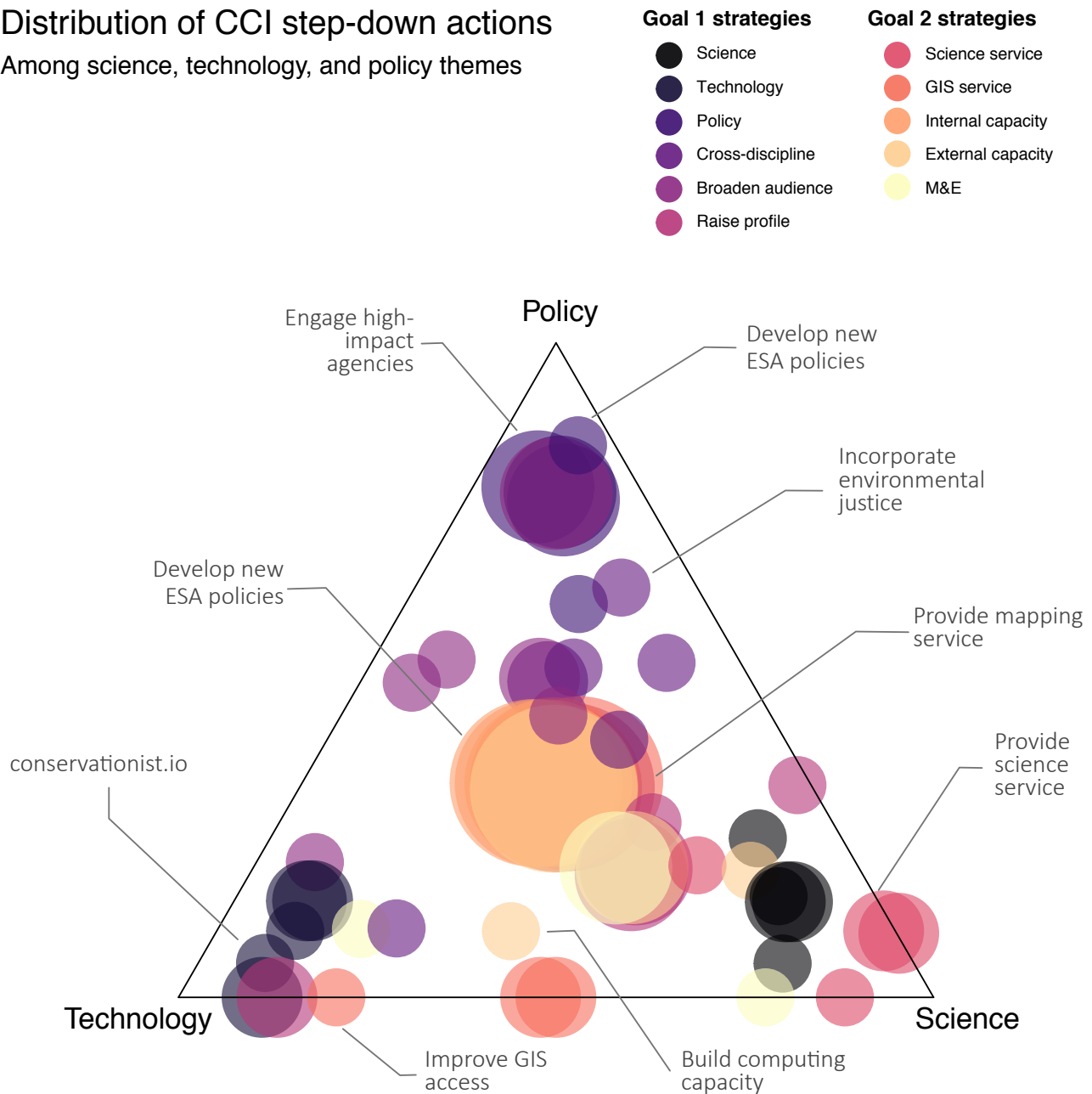
***Develop programs for the measurement and evaluation (M&E) of Defenders' work.***

Title	Description	S/T/P
Develop M&E of CCI's work	Develop processes for measuring and evaluating the effectiveness of CCI's work.	50/30/20
Support M&E of Defender's work	Review and identify best practices for M&E to develop systems well-suited to Defenders' work.	80/20/0
Apply technology to M&E	Test and help apply software and other technologies that improve efficiency of M&E.	20/70/10

*CCI develops digital products like story maps that advance Defenders' wildlife advocacy across the country. This interactive map shows one ESA-listed species in every state.*



## Distribution of CCI step-down actions Among science, technology, and policy themes



*Our 54 step-down actions cover the full science-technology-policy landscape. The circles are “jittered” slightly to show all circles, but general position indicates the relative contribution of each component. For example, the points in the center are a balance of science, technology and policy; a point closer to “policy” has less technology or science emphasis. The size of circles is proportional to the number of actions in that part of the chart. A few select actions are labeled as examples.*





## Measurement and Evaluation

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Adaptive management requires measuring the outcomes of actions and evaluating the measurements against a set of reference points to inform whether changes are needed. Each year, we will report on the suite of measures detailed below for each of our strategies. To evaluate our effectiveness or changes in effectiveness,<sup>1</sup> we will make comparisons to:

1. CCI baseline levels (2017-2018 estimates);
2. previous year's levels;
3. the workplan target for the year; and
4. other, similar organizations.

### Goal 1, Strategy 1 measures

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**Lead program-level applied scientific research.**

#### Measure

Number of peer reviewed publications per year

Number of other publications per year

Number of citations of our research per year in scientific literature

Number of citations of our research per year in governance contexts

Number of citations in Congressional testimony

Number of citations in agency documents

Number of citations in other governance contexts

Coauthor network size

Coauthor network organization diversity

Number of wildlife policies addressed in publications

Number of species addressed in publications

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<sup>1</sup> While our ultimate outcome of interest is conserving native wildlife, most of our work is several degrees removed from that goal. Therefore, we propose measuring numerous *outputs* and *outcomes* that we believe are related to the ultimate outcome.

### Goal 1, Strategy 2 measures

***Develop and apply emerging technologies to enable or improve conservation actions.***

#### Measure

Number of web applications created per year

Number of new technologies tested per year

Number of visitors to CCI website

Number of users of CCI web applications

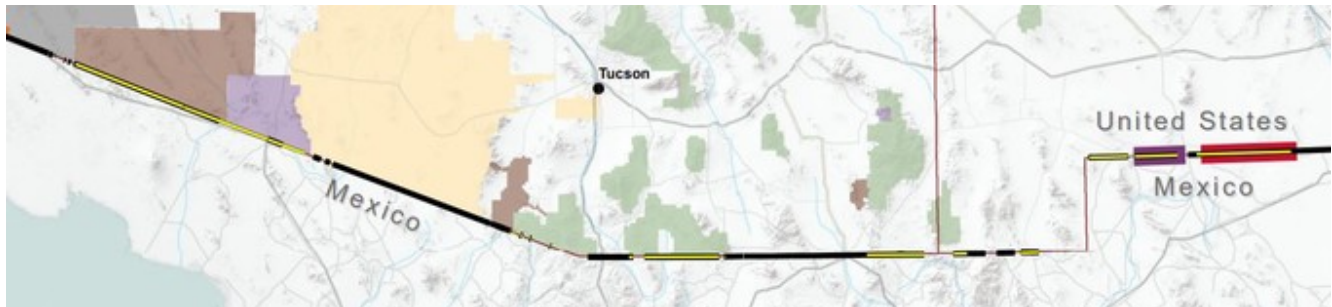
Number of uses of CCI web applications in governance contexts

Spatial extent of CCI web application users

Demographics of CCI web application users

Technology collaborator network size

Technology collaborator network organization diversity



*We map core conservation features like public lands and the US-Mexico border to inform our work.*

### Goal 1, Strategy 3 measures

***Draft and advocate for improved conservation laws, policies, and procedures.***

#### Measure

Number of federal laws supported and signed into law

Number of federal laws supported and passed by at least one house

Number of comment letters written on agency regulations or policies

Number of agency policies changed in accord with advocacy

Number of new laws, policies, or procedures drafted and advocated

Number of species affected by laws, policies, or procedures drafted and advocated

Number of landscapes affected by laws, policies, or procedures drafted and advocated

**Goal 1, Strategy 4 measures**

**Engage and collaborate on cross-domain science, technology, and policies with conservation implications.**

**Measure**

Number of cross-domain projects undertaken

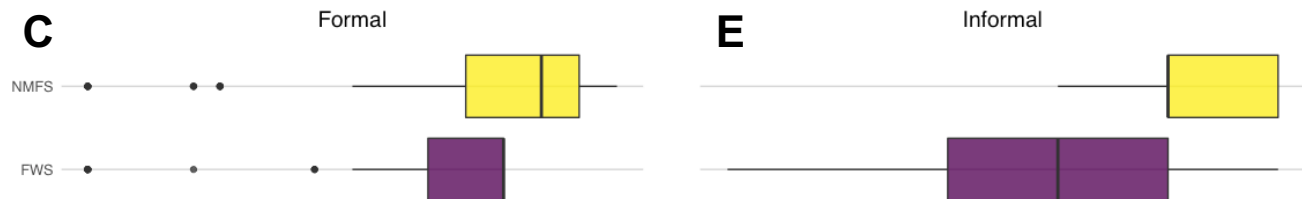
Diversity of domains of science engaged

Number of cross-domain products (papers, apps, etc.) developed

Number of cross-domain policies with conservation implications advocated

Number of cross-domain meetings attended

Number or volume of data sets shared with public and scientific community



We collect novel data on topics like ESA consultation to test how different agencies implement the law. Here we show that NMFS consultations tend to be more complete than FWS consultations.

**Goal 1, Strategy 5 measures**

**Broaden the target audience of our work among decision makers in and out of government.**

**Measure**

Number of non-traditional conservation agencies engaged

Number of state agencies engaged

Number of private-sector parties engaged

Number of international organizations engaged

Number of policies engaged on with new agencies

Number of species engaged on with new agencies

Number of policies / decisions of non-traditional partners changed

## Goal 1, Strategy 6 measures

***Raise our external profile to establish and reinforce CCI's and Defenders' leadership.***

### Measure

- Number of people attending CCI Seminars
- Organizational diversity of people attending CCI Seminars
- Number of invitations to peer review for journals
- Number of journals for which we serve as associate editors
- Number of community workshops sponsored
- Number of invitations to speak to external audiences
- Number of interviews given to the press
- Number of community science programs integrated
- Number of intern applications received
- Number of people engaged through community science



*We are developing a new platform of tools for conservationists to fill outstanding gaps.*

## Goal 2, Strategy 1 measures

***Serve the general science needs of Defenders.***

### Measure

- Number of science requests fulfilled for comment letters
- Number of science requests fulfilled for legal cases
- Number of scientific analyses supported in other departments
- Number of staff mentored in scientific writing or methods
- Number of Defenders reports peer reviewed
- Number of papers and reports curated for Defenders staff

**Goal 2, Strategy 2 measures*****Serve the geospatial science needs of Defenders.*****Measure**

Number of basic map requests fulfilled

Number of story maps created

Number of online map views

Number of requests for Defenders maps from outside groups

Number (or volume) of spatial datasets curated and shared

**Goal 2, Strategy 3 measures*****Expand internal science, technology, and policy capacity.*****Measure**

Number of staff mentored in scientific paper production

Number of papers led by non-CCI staff

Number of staff trained to use CCI or other conservation apps

Number of instances of non-CCI staff citing app data for advocacy

Number of staff or interns trained in policy implementation analysis

**Goal 2, Strategy 4 measures*****Expand internal science, technology, and policy capacity.*****Measure**

Number of new scientists, technologists, or policy analysts collaborating with Defenders

Diversity of new institutions collaborating with Defenders

Demographics of Next-generation Advisors network

Number of trainings for Next-generation Advisors

Number of advisories from Next-generation Advisors

Number of products from external affiliates program

**Goal 2, Strategy 5 measures*****Develop programs for the measurement and evaluation (M&E) of Defenders' work.*****Measure**

Number of existing M&amp;E projects maintained

Number of new M&amp;E projects developed

Number of Defenders' processes adjusted as a result of M&amp;E

Number of grants for which M&amp;E are reported

Number of species covered in M&amp;E projects

Number of focal landscapes covered in M&amp;E projects

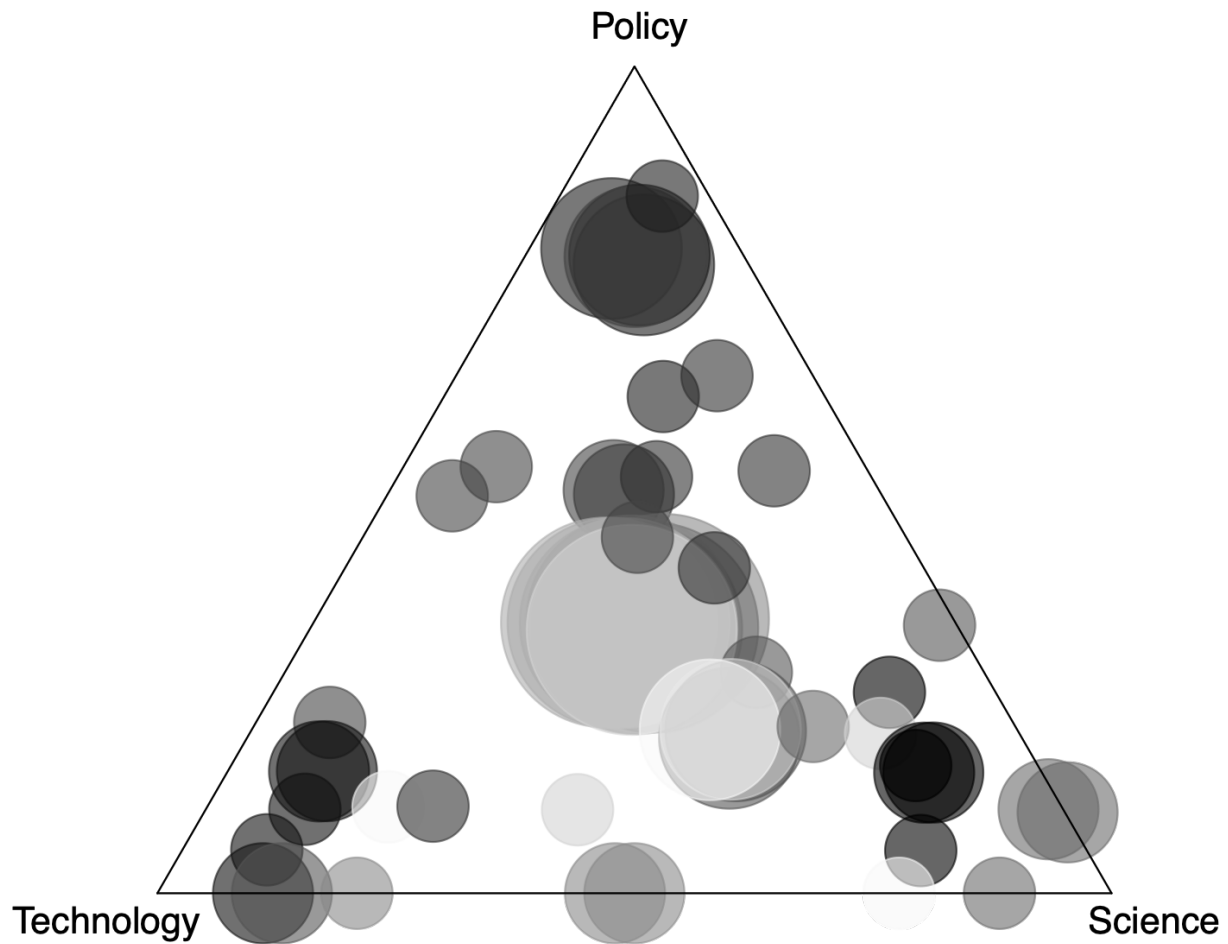






# Center for Conservation Innovation

Strategic Plan, 2019-2024



## Defenders of Wildlife

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