



Mountain Plover by Michael Wunder

THE ROAD TO RECOVERY

GUIDANCE DOCUMENT

ACKNOWLEDGEMENT

Support for this workshop was provided by the Knobloch Family Foundation.

The Knobloch Family Foundation is a private, not-for-profit 501(c)(3), spend-down foundation making grants to understand and sustain our natural world. They work with a network of conservation partners and accept proposals by invitation only.

The 3rd Road to Recovery workshop from which examples were pooled for this guidance document was co-sponsored by: Partners in Flight, Partners in Flight Western Working Group, American Ornithological Society Scientific Committee, and the North American Bird Conservation Initiative.



ACRONYMS

ACJV	Atlantic Coast Joint Venture
CONABIO	Comisión Nacional para el Conocimiento y Uso de la Biodiversidad
CRP	Conservation Reserve Program
JV	Joint Venture
NABCI	North American Bird Conservation Initiative
R2R	Road to Recovery Initiative

GLOSSARY

Adaptive management: A framework in which the user learns from the outcomes of management strategies and adapts these strategies accordingly for success. This framework reflects how conservation strategies can be iterative learning and decision making processes ([Williams et al. 2009](#)).

Co-production: From [Beier et al. 2017](#), "collaboration among managers, scientists, and other stakeholders, who, after identifying specific decisions to be informed by science, jointly define the scope and context of the problem, research questions, methods, and outputs, make scientific inferences, and develop strategies for the appropriate use of science. We use the term partners to collectively refer to these coproducers".

Human dimensions: The elements, disciplines, attitudes surrounding conservation issues that are not about wildlife and habitats. The North American Bird Conservation Initiative (NABCI) dedicated a [bulletin to the Human Dimensions in Bird Conservation](#).

Joint venture: From the [Migratory Birds Joint Venture's web page](#), joint ventures "are cooperative, regional partnerships that work to conserve habitat for the benefit of birds, other wildlife, and people".

Structured decision making: An approach for natural resource management and conservation in which decisions are made in a structured and organized way, rooted in decision theory and risk analysis ([USGS, Eastern Ecological Science Center](#)).

TABLE OF CONTENTS

EXECUTIVE SUMMARY	4
THE DECLINE OF NORTH AMERICAN BIRDS	5
CONSIDERATIONS FOR CO-PRODUCTION, SOCIAL SCIENCE AND COMMUNICATIONS	6
ROAD TO RECOVERY PROCESS	12
A Recovery Process is Proposed	12
The Recovery Process Evolution	13
The Recovery Process Reimagined	14
The Recovery Process Gaps	21

EXECUTIVE SUMMARY

JUSTIFICATION

Almost two years ago, the loss of nearly 3 billion birds from the North American avifauna was documented. The Road to Recovery initiative's vision is to use targeted and actionable science to recover North American bird populations before they become endangered or extinct. We must take a species-specific approach to mitigate threats and ensure sustained recovery of the most at-risk species. Bird conservation is often inextricably linked to human dimensions via shared resource concerns, as such we need to embrace the human dimensions in the recovery process. We need to challenge ourselves to learn to incorporate the social sciences, co-production and communications in each step of the recovery process.

THE ROAD TO RECOVERY: WORKING ON A PROCESS FOR SUSTAINED POPULATION RECOVERY FOR SPECIES ON THE BRINK

Bringing back the abundance and safeguarding the diversity of the North American avifauna will require a coordinated, strategic, and deliberate effort in both science and conservation action. The first two workshops in the Road to Recovery Series focused on approaches for understanding causes of species declines.

In the [3rd workshop](#), we aimed to develop a process for advancing species towards sustainable population recovery, beginning with "Species on the Brink". The species on the brink are those that we wish to avoid being federally listed as endangered, extinct or extirpated in the near future.

This is a *guidance document* to the Road to Recovery process that we are developing. We aim to use the Road to Recovery as an opportunity to practice co-production by learning and incorporating experiences from all parties and people interested in sustained bird population recovery.

This guidance document presents introductory pages with considerations for the incorporation of **co-production**, **social science** and **communications** into bird population recovery efforts. These considerations are followed by perspectives from recovery teams, working groups, migratory bird joint ventures and international conservation partners.

The introductory pages are followed by the development of the Road to Recovery process.

THE DECLINE OF NORTH AMERICAN BIRDS

Problem Statement: The 2019 *Science* publication documented the loss of nearly 3 billion birds from the North American avifauna; loss of abundance is pervasive across biomes, taxonomic groups, and among both common and rare species. Although general threats to birds are well known (e.g., habitat loss, anthropogenic causes of mortality), we still cannot point to the specific causes of declines for most bird species. These need to be assessed on a species-by-species basis, even if solutions to reverse declines are implemented more broadly across habitats, geographies, or suites of species. Understanding species- and population-specific limiting factors (the drivers of declines) across the full annual cycle, including knowledge of migratory connectivity and demographically distinct populations, will allow us to efficiently target limited conservation resources in the highest-priority landscapes and spatially prioritize our conservation actions. Furthermore, incorporating **social science**, **co-production** and **communications** through a more holistic group of partners in conservation, guarantees a process supported across diverse partners, those implementing and those impacted by conservation actions, and strives to eliminate the implementation gap.



Baird's Sparrow by Rick Bohn/USFWS

**CONSIDERATIONS FOR
CO-PRODUCTION, SOCIAL SCIENCE
AND COMMUNICATIONS**

CONSIDER THESE STEPS FOR CO-PRODUCTION

1. ASK YOURSELF: WHO ARE THE PARTNERS?

A systematized **conservation partner search** (e.g. stakeholder analysis) can help you identify key partners. Co-producers should consider the inclusion of a "**broker**," a person that could represent specific groups' interests or underrepresented communities.

A broker can communicate among a diversity of partners from those at the decision making to those impacted by conservation strategies. The broker also is helpful to remain neutral when conflicting objectives emerge. Another key role among co-producers is the **decision maker(s)**, entity or individual who will make decisions.

2. ENGAGE PARTNERS IN PROCESS

Each partner requires specific engagement depending on their **objectives**. Objectives stem from the interest of each partner on the research or conservation strategy. Even the objectives of partners that are not decision makers can be maximized through a decision analysis process in which a threshold of acceptance can be applied to each objective. In other words, how low or high can the measure of success of an objective be for a partner to remain engaged?

3. BE PATIENT WITH PROCESS

Established structures of how research and conservation action are conducted may discourage or impede the adoption of co-production. Co-production that is truly inclusive can be considered a slow process, but the benefit is that the resulting work will be more broadly relevant and more likely to succeed. Additionally, a co-production process does not need to paralyze conservation actions; any project that has immediate support could be started with the commitment that much will be **learned** and **adapted** along the way.

CONSIDERATIONS FOR INCLUSION OF SOCIAL SCIENCE

1. WHICH SOCIAL SCIENCE TO INCLUDE?

The social sciences encompass many sub-disciplines. How do you choose which kind(s) of social science to include in the planning and recovery process? You have options:

- Think of the question or conservation problem to guide you to consider the different disciplines (e.g., economy, psychology, political science).
- With the co-producers, use a tool like [Open Standards for the Practice of Conservation](#) to determine the issues that can lead to the identification of the social sciences you need.
- Consult or bring a social scientist to your team to help you identify which social sciences would be important to explore.

Bird conservation may not be the priority for some of the partners, especially across a geopolitical spectrum in today's world. Upon taking action, consider the objectives, interests and current capacities of both conservation partners and science users, especially those who are impacted by decisions.

2. NAVIGATE BIRD CONSERVATION WITH AWARENESS

If you are an independent researcher, reflect on how social sciences interact with the biological sciences. If you are a professional working in an organization or institution, seek social scientists or human dimensions professionals. Does your workplace have a department or a professional in these disciplines?

3. EMBRACE THE PROCESS AND CHALLENGES OF INCORPORATING SOCIAL SCIENCES

Be ready to embrace multi-disciplinary work challenges and learn from each other.

Don't forget it is never too early or too late to involve a social scientist!

CONSIDERATIONS FOR INCLUSION OF COMMUNICATIONS

1. CARVE SPACE IN YOUR PROJECT FOR COMMUNICATIONS

Engage partners early and often. Signal interest whether it is by engaging professionals that have experience in these topics or begin by exploring existing bird conservation communication campaigns and plans to learn more about materials used, strategies, and more. Consider multiple ways of communicating externally: op-eds, lectures, newsletters.

2. PREPARE TO RESPOND OR ADDRESS DIFFICULT DISCUSSIONS

Sometimes external communications about a polarizing issue are necessary to move a conservation message forward. Avoiding discussion of polarizing issues with your team may mean that you are unable to address controversies with the broader public. Prepare to respond or address difficult discussions that stem from the content of a communications campaign. Assess the science foundation, the conservation goal and evaluate what aspect of your message may have triggered reactions. If a polarizing issue arises internally, consider keeping in mind shared values and goals that bring people together.

3. EVALUATE YOUR EFFORTS

There are many ways to evaluate the effectiveness of communications efforts. 1) Summarize metrics such as visits to web pages and social media shares and likes on campaigns and websites. Do not forget to collect anecdotes or stories of how people interact with the content as these stories showcase the importance of communications. 2) When evaluating outreach tools or resources, ask the users what they found useful, request feedback for improvement. 3) Evaluate stewardship indicators by monitoring the target audience. As an example, if the campaign was targeted at promoting an action, track adoption of the actions and correlate them to the campaign reach. Evaluating the effectiveness of communications efforts is challenging, which is why multiple avenues of evaluation may best capture the success or failures of efforts.

INSIGHTS FROM RECOVERY TEAMS & WORKING GROUPS

RECOVERY TEAMS

- The recovery work is **adaptive and science is key**. In some cases, it led to understanding that small-scale factors are not crucial (i.e. grassland cover, not microhabitat features, had most influence on sage grouse populations). In other cases it led to key conservation actions (i.e. Red-cockaded Woodpecker's cooperative breeding behavior revealed that creating nesting cavities would be helpful as opposed to just having the habitat).
- Knowing what is **relevant** to conservation partners to be engaged in the recovery process would have been useful early on.
- During co-production, foster a unified mission while considering diverse partners perspectives.
- Keep partners diverse! The key partners with excellent interpersonal abilities may be found where you least expect them.

VALUABLE LESSONS

CRITICAL CHALLENGE

- Species could be conservation reliant after de-listing, down-listing, or avoiding listing altogether. Funds and efforts are still needed for these species even after conservation milestones, with other species also needing support to begin their work.

WORKING GROUPS

- Bring in the social science and co-production knowledge as early as possible. It may not be feasible to do at the beginning but commit sooner rather than later.
- Capacity to lead and organize are the top qualities of a species working group coordinator. The species biologist may not necessarily be the most effective working group coordinator.
- Start small in implementing conservation strategies; target a single region and threat initially. Build up the conservation partnerships to expand the tasks.
- Funding people that conduct the work of coordinating the recovery efforts and working group tasks is hard. Investing in people is undervalued but critical to success.

- To implement actions and have impact at larger scales, the interests and goals of other partners and land users need to be considered. There is still not a clear procedure for how to insert the species needs in the scope of human needs and landuses (i.e., agriculture groups, forestry groups, public land managers).

INTERNATIONAL WORK PERSPECTIVES

1. FRAME THE CONSERVATION STRATEGY WITHIN THE NEEDS OF PEOPLE AND COMMUNITIES

Claudia Macías from ProNatura in Mexico shared that social science work is needed to connect the threats to the bird populations with the needs of people: **soil protection**, **water quality** and access and **stable livelihoods**.

2. MAKE MEDIUM AND LONG-TERM EMPOWERMENT OF LOCAL PEOPLE A PRIORITY

Humberto Berlanga from CONABIO in Mexico reminded us that citizen science is a tool that can be used to increase awareness and interest in birds. The local people that are sharing the space with the bird communities of interest need to be engaged as stewards and involved in the process of co-production.

Christen Nelson from the University of Minnesota highlights that people are natural problem solvers and local communities can be involved in the design of the conservation strategies and research questions.

3. MULTI-SCALE PROCESSES ACT ON THE ECOSYSTEMS ON WHICH THE BIRDS DEPEND

To what extent do we know how the local, regional and global forces (i.e., market, economics, policies) interact to drive the ecosystems that birds depend on? Including social science to understand power structures and macroeconomics could be insightful in the bird recovery planning processes.

INSIGHTS FROM MIGRATORY BIRD JOINT VENTURES

VALUABLE LESSONS

- Migratory Bird Joint Ventures (JV) have a focus on large geographies. Conducting workshops or co-production meetings by sub-regions requires time but is valuable to have the research and the conservation strategies applied at larger scales. Larger scales of work may be required to have impact on species at risk.
- Tie the **relevancy** of the drivers of decline to what is relevant to people. Investment in the social sciences will accelerate building relevancy where it has not been identified.
- Be ready to learn as you go - intertwine the social sciences and the biological sciences.
- For large geographic regions it may not be possible to include every community in the process of bird recovery. Science needs to be of quality so it can have a better chance of being broadly applicable, perhaps to a different region or at a larger scale. In cases where multiple genetic populations have distinct threats and growth trajectories, conservation strategies should also be flexible to the nuances of the biology and inherent geographic variation in vital rates and drivers of decline.

CRITICAL CHALLENGES

- Society is concerned with big issues and these issues are diverse across the focal geographies of JVs.
- To recover bird species whose ranges extend beyond the borders of a given JV, JVs will need to expand the geographies with which they are concerned or perhaps collaborate with other JVs to connect the full annual cycle of migratory birds at risk the same time, if bird population recovery is a goal, the geographies of focus extend beyond the immediate JV borders. The next challenge is filling the relevancy gaps within the current extent of a JV and expanding the geography that will connect the full annual cycle of migratory birds at risk.

CURRENT EXTENSION

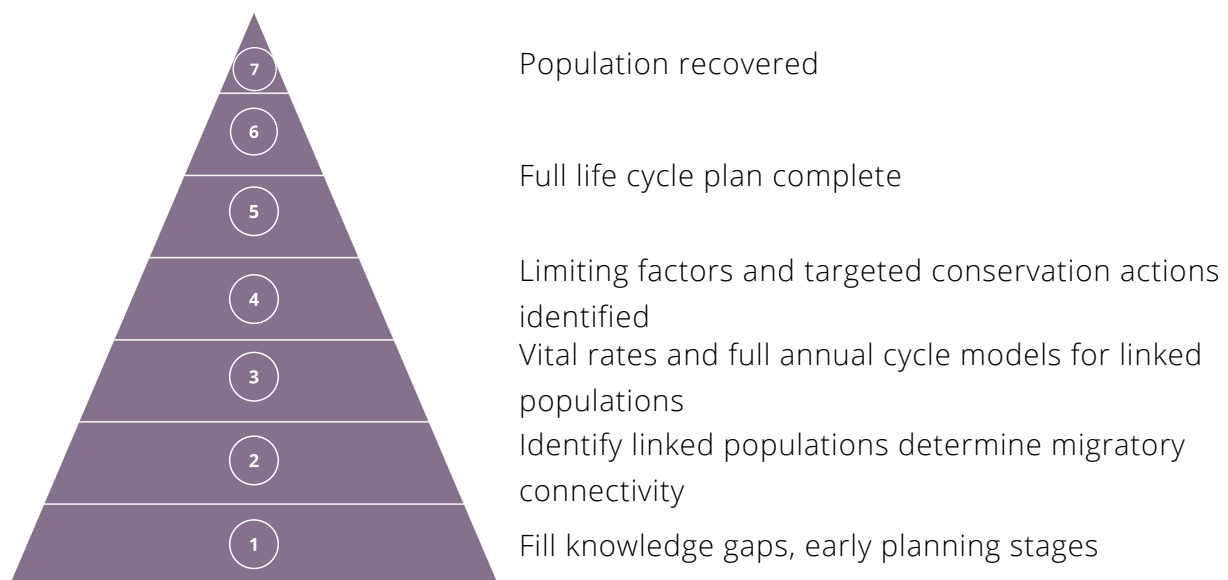
- Across the geographic extent of JVs there are multiple **underrepresented groups** that need relevant ties to the conservation strategy. It is a commitment and responsibility of bird conservation to not overlook engaging these partners in co-production.

**ROAD TO RECOVERY PROCESS:
A GUIDANCE**

ROAD TO RECOVERY PROCESS

A Recovery Process is Proposed

The Road to Recovery (R2R) process proposed initially was visualized in 2020 with a pyramid. The base represents the beginning of the road to recovery: a need for the species recovery is recognized and research is conducted to determine the species limiting factors that could guide the conservation strategies effectively. The road then progresses up the pyramid to the tip, or end goal of a seven-step process: a recovered population.



The first R2R workshop focused on the approaches and modeling techniques to determine the causes of bird declines. Scientists shared knowledge on the use of modeling techniques to integrate data from different sources, linking full annual cycle's vital rates with management actions and more. The main message of this first workshop was the need to fill knowledge gaps that elucidate the limiting factors for species on the brink.

The second R2R workshop focused on the methods to determine limiting factors across the full annual cycle. Scientists shared knowledge on technologies to study migratory connectivity. An important message from the second workshop was that reaching a full annual cycle understanding of bird population limitation will require time and collaboration with multiple partners, but determining limiting factors is key to the R2R recovery process.

For more information access the workshop reports:

1. [Identifying the causes of bird declines](#)

2. [Linked populations: Migratory connectivity and demographics](#)

The Recovery Process Evolution

Although the pyramid model outlined the biological science steps necessary to understand species declines and develop recovery strategies, it did not integrate **human dimensions** of complex conservation challenges. The first and second workshops focused on the biological science steps. The third workshop arose from the following reflective questions:

- Where in the process do we incorporate social sciences and communications?
- What aspects of social science to incorporate?
- How and when in the recovery process does co-production begin?

The current R2R recovery process hinges on the assumption that an intersection between the biological and social sciences is necessary to eliminate the implementation gap and to achieve and sustain recovery.

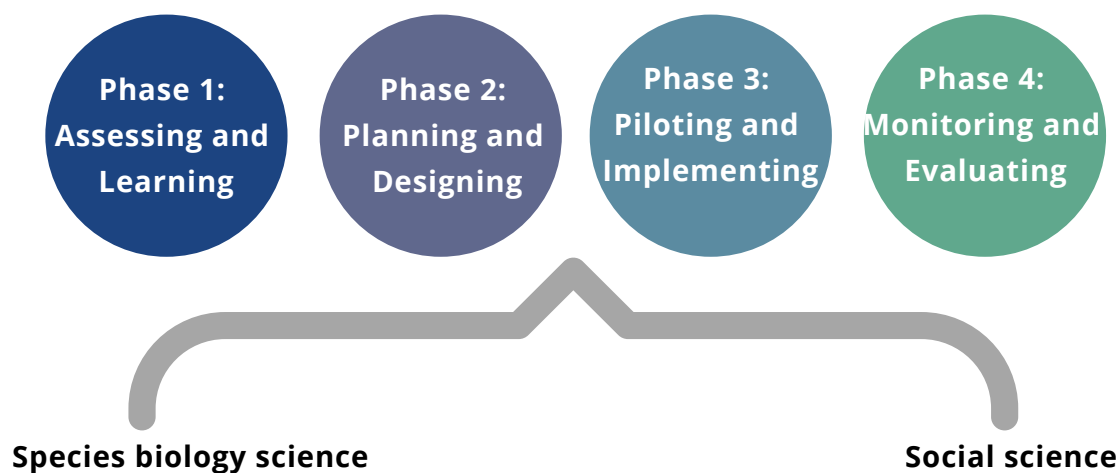
In this document we gather the expertise of professionals in the **social sciences, co-production, and communications** to propose an **integrated process to achieve sustained recovery of declining bird populations**. We pool lessons learned from recovery teams, species working groups, international efforts, and joint ventures. Using these lessons, we propose a guided recovery process with examples of what we learned during the workshop.



Barn Swallow by Karen Hogan

The Recovery Process Reimagined

Recognition of the need to incorporate the social and biological sciences in parallel to achieve sustainable bird population recovery led to a reorganization and simplification of the pyramid into phases. The phases are no longer represented by a pyramid because a progression from a wide base to a small tip suggests that the work becomes easier at later stages, whereas the implementation of recovery plans is likely to take the bulk of the resources, time, and money. The recovery process can also be non-linear and is adaptive with phases feeding back to previous steps.



Next we present the recovery process reimagined by pooling the experiences of participants in their bird conservation journeys. The phase of the R2R process is followed by biological and social science steps considered important and actionable items with examples presented in boxes. These examples focus on the themes of the social sciences and co-production. The biological science steps have been presented and discussed in detail during the previous two R2R workshops. Reports summarizing the [first](#) and [second](#) workshops are available online.



**Phase 1:
Assessing and
Learning**

Biological Science Steps

Social Science Steps

→ Identify species as priority.

- Review the **species on the brink** list prepared to determine how close a species is to potentially being listed or continuing precipitous declines:
<https://marralab.com/r2r-urgency-list/>



Whimbrel by Peter Pearsall/ USFWS

Whimbrel is a species on the brink in the **Very High Urgency** category, based on its very large long-term population loss (>75%) and with continued or accelerated declines in the recent period. As such it is a species in need of recovery.

- Determine status of knowledge of causes of decline.
 - Conduct an analysis to identify partners in conservation: Create a strategy to find the right partners, aiming for diversity.
 - Use the range of the species to list who is sharing the land with the bird populations. Consider all possible users: private landowners, indigenous peoples, underrepresented groups, government agencies, and other civil groups. When listing, identify which groups will likely be implementers, who has decision power, and who has broker capacity (ability to communicate across groups).
 - Identify and gain understanding on partners' objectives and needs.

- List the status of the species biological knowledge: distribution, threats, and population connectivity. Pair this knowledge with an evaluation of how and where in the full annual cycle human dimensions may play a key role in the ability to implement conservation action and delivery, once the limiting factors are identified.

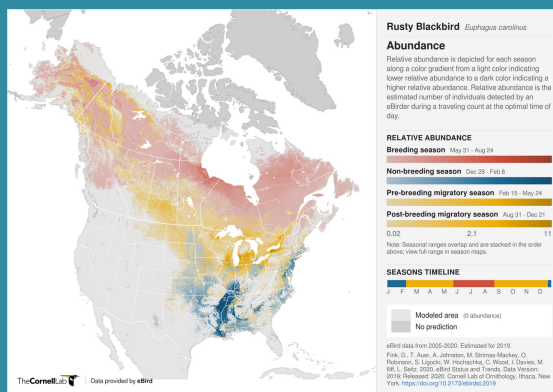
Examples of how workshop participants have filled knowledge gaps for species recovery. We did not include examples from working groups in which partner identification analysis or strategies were in place to evaluate if the conservation partners included key and diverse groups from users to impacted peoples. However, many provided helpful insight on how they started to build partnerships.



Rusty Blackbird by Andy Reago & Chrissy McLaren

The International Rusty Blackbird Working Group used natural history knowledge on where the species nested to start seeking partners. This led to identifying that a group that needs to be engaged was industrial forest landowners. Subsequently the interests of this group would be taken into consideration for conservation strategy planning and implementation.

Drew Lanham (Clemson University) provided examples of a term he is transforming to be more comprehensive: Range Mapping. Via range mapping, bird recovery for the Rusty Blackbird would identify partners by layering socioeconomic and demographic attributes of the humans that share the range with the species. For example: Are underrepresented groups included in the bird recovery process and decision formulation? Can we learn from socioeconomic indicators of human well-being by overlaying the species range with the United States Department of Agriculture’s Food Access Research Atlas?



eBird data from 2005-2020. Estimated for 2019. Fink, D., T. Auer, A. Johnston, M. Strimas-Mackey, O. Robinson, S. Ligocki, W. Hochachka, C. Wood, I. Davies, M. Iliff, L. Seitz. 2020. eBird Status and Trends, Data Version: 2019; Released: 2020. Cornell Lab of Ornithology, Ithaca, New York. <https://doi.org/10.2173/eBirdst.2019>

→ Fill biological and social science knowledge gaps through co-production: Identify linked populations, migratory connectivity, vital rates, and full annual cycle models. Determine how social capacity and interest vary across the range.

- Practice co-production of each or some of the components of the recovery process: research, design of strategies, implementation. Use actionable science approaches, below some examples:
- Use **Structured Decision Making** as a tool to identify the path of knowledge gap filling, visualizing the end objective of bird recovery. Consider every partner's objectives and attach thresholds of satisfaction in case two conflicting objectives arise.
- Alternatively, use the **Open Standards for Conservation** in which the starting point is to examine the threat drivers which lead to identify social sciences needed and partners that should be engaged.

- Include local people in the process (local = people that are sharing the habitat with the bird species, where the conservation strategies get implemented). This is particularly important if the recovery team is not local already, such as when working in different parts of a species full annual cycle.



Shade coffee farm in Honduras by Fabiola Rodríguez

Incorporating the local users of the habitat in the co-production of research may not be a common practice. Nick Bayly from SELVA suggests that asking people their needs and what they hope to get out of research is valuable. It may be possible to incorporate tasks to the research process to meet multiple goals. In the coffee growing regions of Colombia, producers may find it helpful for research on the migratory bird species to also explore what kinds of trees that work for birds also work for the farm (e.g. what species attract birds that also control pests?).

Phase 2: Planning and Designing

Biological Science Steps

- Synthesize knowledge and identify limiting factors along with with targeted conservation strategies for bird population recovery.

Social Science Steps

- When the limiting factor begins to be unveiled, determine what social science is needed to build a strategy. Different types of limiting factors will require different strategies and levels of engagement with people.
- Co-produce the implementation with partners, determine what actions will be part of a strategy that works for the birds and considers the values and interests of conservation partners. It is essential for the R2R process to consider actions that will be able to show benefits for the bird population (i.e. an action benefits the vital rates and bird populations).



Saltmarsh Sparrow by David Eisenhauer/USFWS

The Atlantic Coast Joint Venture and the Saltmarsh Habitat & Avian Research Program have determined that one of Saltmarsh Sparrows' biggest limiting factors is driven by climate change via rising seas that modify the breeding habitat. The conservation strategy requires science innovation to create Saltmarsh Habitat. Aimee Weldon from ACJV highlighted a strategy that guides the implementers: what is the bird population goal, where is it needed, when and how.

One of the drivers of decline for Lesser Yellowlegs is unsustainable harvest, impacting breeding populations in different ways. The conservation strategy for this species requires refining the knowledge on how the drivers of decline operate across the full annual cycle and will require knowledge on socio-economic and cultural drivers of harvest.



Lesser Yellowlegs by Brad Winn

- Complete full life cycle plan with conservation strategies and their feasibilities delineated.

- Explore existing conservation plans. Evaluate what type of driver and strategies are proposed, and how social science, co-production and communications played a role in its generation.
- Be critical. When building a full life- cycle plan, is the plan considering the species biological aspects that will make conservation effective? If limiting factors have not been identified, the plan could be drafted and built upon. *Key to the R2R process is to think of the species.* Even if the process is not linear, do not omit the steps of understanding the species requirements or evaluating if the key conservation partners have been included.

Phase 3: Piloting and Implementing

Biological Science Steps

- Pilot and implement actions for recovery through co-production.

Social Science Steps

- Recall **adaptive management framework** to assess if new conservation partners from different fields should be engaged or if the action from the strategy of conservation is effective.

- Execute social science components to sustain involvement of people during implementation. This item is not about fixing complex problems that are out of the capacity of partners. If co-production considered the goals of implementers or land users, those objectives tasks are executed in tandem with the biological management actions in this phase.

Implementation success hinges on the co-producers' participation, which, in turn is motivated by their needs and objectives. To implement the actions for bird populations, the goals of conservation partners need to be considered. The social science components will differ if the implementers are operating in public lands or private lands.

Actions will vary from securing participation in incentives programs, maximizing crop performance and benefits for birds and people, and/or gaining traction with policies that intersect the birds and the humans.

Jessica Barnes (North American Bird Conservation Initiative), highlighted social science research that revealed what the hindrances are to obtain more enrollments of private lands into grassland conservation programs like the Conservation Reserve Program.



Claudia Macías (PRONATURA suc A.C.), highlighted her experiences in Mexico in which the conservation of habitat for species like the Golden-cheeked Warbler are founded on the identification of the communities needs such as soil protection and water quality for sustained livelihood. These values of the land for bird and people are incorporated into best management practices.

**Phase 4:
Monitoring and
Evaluating**

Biological Science Steps

- ➔ Monitor bird populations.

Social Science Steps

- Pinpoint and quantify which conservation strategies influenced changes in attitude or behaviors of people.

- Specify challenges in the ability to determine if conservation strategies cannot be linked to bird population recovery. It is key in the R2R process to tie back actions to population recovery.

 Population recovered

- Determine if, after the recovery process, a species will continue to be reliant on conservation efforts/land management. Can sustained, minimal investment or zero investment strategies be co-produced once the population is stabilized and recovered?

The Recovery Process Gaps

The Road to Recovery Process has evolved from a series of steps focused on the biology of the species to identifying how and when the human dimensions can be incorporated. However, the design of the R2R process is not finished. We discovered through participant feedback during this third R2R workshop that there are more ramifications and adaptations of the process to be developed. There are also challenges that we won't overcome until we move a species along the road to its recovery and gather information on how the process worked. Below are some aspects of the R2R process that we need to develop.

1. The R2R process stems from the need to recover species on the brink, or rapidly-declining species who are on their way to federal endangered-species listing. There are multiple success stories of population recovery, but we have not determined how to achieve **sustained population recovery**. Species conservation reliance is a challenge, considering there are multiple species that need resources to begin the work.

2. The inclusion of social science, co-production and communications is needed, but more training and knowledge is needed within our bird conservation communities on how to effectively incorporate these. Despite this, past and current recovery efforts have incorporated some aspects of co-production and social sciences. What seems to be the next step is to **evaluate and learn from the strategies or incorporation of human dimensions for successes and challenges**.

NEXT STEPS

The Road to Recovery Process will continue to evolve with further input sought from workshop participants and other interested parties. An outcome from participant input was the suggestion of holding short format, interactive sessions to continue exploring the aspects of bird conservation and the recovery process in depth. These **engagement sessions** will be an opportunity to co-produce the Road to Recovery process.

SPECIAL THANKS TO THE ROAD TO RECOVERY COMMITTEE

- Pete Marra (Georgetown University)
- Paul Schmidt (Director- Road to Recovery)
- Ken Rosenberg (Cornell Lab of Ornithology)
- Tom Will
- Anna Lello-Smith (Cornell University)
- Brandt Ryder (Bird Conservancy of the Rockies)
- Ashley Dayer (Virginia Tech)
- Sarah Kendrick (Missouri Department of Conservation)
- Robert Ford (Partners in Flight)
- Stan Senner
- Emily Jo Williams (American Bird Conservancy)
- Todd Fearer (Appalachian Mountain Joint Venture)
- Randy Dettmers (USFWS)
- Edwin Juárez (Arizona Game and Fish Department)
- Miyoko Chu (Cornell Lab of Ornithology)
- Fabiola Rodríguez-Vásquez (Tulane University)
- Drew Lanham (Clemson University)
- Humberto Berlanga (Comisión Nacional para el Conocimiento y Uso de la Biodiversidad)
- Wendy Easton (Environment & Climate Change Canada)

PHOTO CREDITS

Mountain Plover courtesy of Michael Wunder	Front Cover
<u>Baird's Sparrow</u> by Rick Bohn/USFWS Mountain-Prairie <u>Creative Commons Attribution 2.0</u>	4
<u>Barn Swallow</u> by Karen Hogan/Macaulay Library at Cornell Lab of Ornithology	12
<u>Cactus Wren</u> by Brian Sullivan/Macaulay Library at Cornell Lab of Ornithology	13
<u>Whimbrel</u> by Peter Pearsall/USFWS <u>Public Domain</u>	14
<u>Rusty Blackbird</u> by <u>Andy Reago & Chrissy McLarren</u>	15
Shade coffee farm in Honduras courtesy of Fabiola Rodríguez	16
Saltmarsh sparrow chick by David Eisenhauer/USFWS Creative Commons Attribution 2.0	17
Lesser Yellowlegs courtesy of Brad Winn	17
<u>Golden-cheeked Warbler</u> by USFWS/ <u>Public Domain</u>	19
Mountain Plover courtesy of Christian Artuso	Back Cover

Link to Recordings: <https://marralab.com/r2rpart3/>



Mountain Plover by Christian Artuso