Lesser Yellowlegs by Brad Winn

THE ROAD TO RECOVERY

DEVELOPING THE PROCESS OF RECOVERY FOR NORTH AMERICAN BIRDS

27-29 JULY 2021 VIRTUAL WORKSHOP REPORT

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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 this 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. The 3rd workshop was exploratory in nature and this report presents the synthesis of experiences provided by professionals working in bird conservation incorporating the biological sciences, social sciences, and/or co-production.

Baird's Sparrow by Rick Bohn/USFWS

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.

Workshop Purpose: The third workshop was held virtually from July 27-29, 2021. The purpose of the third workshop was to explore how **social science**, **communications** and **co-production** can be incorporated in the road to recovery for the recovery of species on the brink and to eliminate the implementation gap.

Who Attended: The third workshop was attended by 511 participants during the three days. These participants ranged from current bird species experts and working groups, social scientists, conservation practitioners and other conservation partners. In summary, individuals interested in bird conservation.

Kirtland's Warbler by Joel Trick, USFWS

Scope: The recovery of North American bird populations is a Western hemisphere endeavor. This report contains primarily, experiences from the United States and additional experiences from Canada, Mexico, Colombia and more. R2R has begun taking steps to co-produce the recovery process with international partners. Stay tuned for future international focused virtual sessions in 2022.

Desired Outcomes for the July Workshop

- A synthesis on how we can incorporate social science, co-production and communications in the road to recovery process.
- A reimagined Road to Recovery Process with examples for the inclusion of the social sciences and co-production from existing bird conservation efforts.

ROAD TO RECOVERY THIRD WORKSHOP SYNTHESIS

AGENDA

DAY 1: TUESDAY JULY 27
INCLUSION OF SOCIAL SCIENCE, CO-PRODUCTION AND COMMUNICATIONS IN SPECIES RECOVERY

MORNING SESSION 11:00AM - 1:00PM EDT

11:00 Welcome and logistics — Paul Schmidt, *Road to Recovery*

11:05 Introduction to workshop — Paul Schmidt, *Road to Recovery*

11:20 Plenary: "Conservation – a Human Endeavor" — Ashley Dayer, *Virginia Tech*

12:00 Panel: Co-production in bird conservation

Moderators: Brandt Ryder, *Bird Conservancy of the Rockies*
Ashley Dayer, *Virginia Tech*

Panelists: David Pavlacky, *Bird Conservancy of the Rockies*
Sarah Converse, *University of Washington*, *USGS Washington Cooperative Fish and Wildlife Research Unit*
Sarah Saunders, *National Audubon Society*

1:00 Adjourn

AFTERNOON SESSION 2:00 - 4:00PM EDT

2:00 Panel: Social science in bird conservation

Moderators: Ashley Dayer, *Virginia Tech*
Brandt Ryder, *Bird Conservancy of the Rockies*

Panelists: Jessica Barnes, *North American Bird Conservation Initiative, Virginia Tech*
Liliana Naves, *Alaska Department of Fish and Game*
Brad Andres, *US Shorebird Conservation Partnership, US Fish and Wildlife Service*

3:00 Panel: Communications in bird conservation

Moderators: Ashley Dayer, *Virginia Tech*
Brandt Ryder, *Bird Conservancy of the Rockies*

Panelists: Miyoko Chu, *Cornell Lab of Ornithology*
Meagan Racey, *US Fish and Wildlife Service, North Atlantic-Appalachian Region*
Hannah Nikonow, *Intermountain West Joint Venture*

4:00 Adjourn

DAY 2: WEDNESDAY JULY 28
RECOVERY STORIES: PROCESS AND THE EFFORTS OF SPECIES WORKING GROUPS AND INITIATIVES

MORNING SESSION 11:00AM - 1:10PM EDT

11:00 Introduction to day 2— Sarah Kendrick, *Missouri Department of Conservation*

11:05 "The Road to Recovery Process" — Ken Rosenberg, *Cornell Lab of Ornithology*, *American Bird Conservancy* & Fabiola Rodríguez, *Tulane University*

11:25 Introduction to species recovery stories — Sarah Kendrick, *Missouri Department of Conservation*

11:30 ESA Recovery Teams — Michelle Shaughnessy, *US Fish and Wildlife Service*

11:40 Recovery story: Kirtland's Warbler — Carol Bocetti, *California University of Pennsylvania*

11:55 Recovery story: Red-Cockaded Woodpecker — Jeff Walters, *Virginia Tech*

12:10 Recovery story: Greater Sage Grouse — Tim Griffiths, *US Department of Agriculture*, *Natural Resources Conservation Service*

12:25 Panel: Lessons learned from recovery and what it can mean for 'Birds on the Brink'

Moderator: Sarah Kendrick, *Missouri Department of Conservation*
Panelists: Michelle Shaughnessy, *US Fish and Wildlife Service*
Carol Bocetti, *California University of Pennsylvania*
Jeff Walters, *Virginia Tech*
Tim Griffiths, *US Department of Agriculture*, *Natural Resources Conservation Service*
Fabiola Rodríguez, *Tulane University*

1:10 Adjourn

AFTERNOON SESSION 2:00 - 4:30PM EDT

2:00 Introduction to species working groups and initiatives & lightning talks part 1 — Bob Ford, *Partners in Flight, US Fish and Wildlife Service*

2:05 Golden-winged Warbler Working Group — Amber Roth, *University of Maine*

2:10 Lesser Prairie Chicken Initiative — Christian Hagen, *Oregon State University*

2:15 ACJV Saltmarsh Sparrow — Aimee Weldon, *Atlantic Coast Joint Venture, US Fish and Wildlife Service*

2:20 Tricolored Blackbird Working Group — Neil Clipperton, *California Department of Fish and Wildlife*

2:25 Panel: Species working groups and initiatives and the incorporation of social science, co-production, and communications during their early to mid- stages of working with recovery

Moderator: Bob Ford, Partners in Flight, *US Fish and Wildlife Service*

Panelists: Amber Roth, *University of Maine*
Christian Hagen, *Oregon State University*
Aimee Weldon, *Atlantic Coast Joint Venture, US Fish and Wildlife Service*
Neil Clipperton, *California Department of Fish and Wildlife*
Jessica Barnes, *North American Bird Conservation Initiative, Virginia Tech*
Kelly VanBeek, *US Fish and Wildlife Service*
Ken Rosenberg, *The Cornell Lab of Ornithology, American Bird Conservancy*

3:15 Transition to lightning talks part 2 — Bob Ford

3:20 Pinyon Jay Working Group — Scott Somershoe, *US Fish and Wildlife Service*

3:25 ACJV Black Rail Working Group — Aimee Weldon, *Atlantic Coast Joint Venture, US Fish and Wildlife Service*

3:30 Alaska Shorebird Group: Lesser Yellowlegs — Jim Johnson, *US Fish and Wildlife Service*

3:35 International Rusty Blackbird Working Group — Carol Foss, *Audubon Society of New Hampshire*

3:40 Panel: Species working groups and initiatives and the incorporation of social science, co-production and communications during their early to mid-stages of working on recovery

Moderator: Bob Ford, Partners in Flight, *US Fish and Wildlife Service*

Panelists: Scott Somershoe, *US Fish and Wildlife Service*
Aimee Weldon, *Atlantic Coast Joint Venture, US Fish and Wildlife Service*
Jim Johnson, *US Fish and Wildlife Service*
Carol Foss, *Audubon Society of New Hampshire*
Jessica Barnes, *North American Bird Conservation Initiative, Virginia Tech*
Kelly VanBeek, *US Fish and Wildlife Service*
Ken Rosenberg, *Cornell Lab of Ornithology, American Bird Conservancy*

4:30 Adjourn

DAY 3: THURSDAY JULY 28
OUTLOOK TO FUTURE: INTEGRATING CULTURAL PERSPECTIVES, JOINT VENTURES AS IMPLEMENTATION ARMS, AND NEXT STEPS FOR R2R

MORNING SESSION 11:00AM - 1:10PM EDT

11:00 Introduction to day 3: Species working groups and initiatives outside the US and multi-country efforts — Wendy Easton, *Canadian Wildlife Service*

11:05 Recovery of the Yellow-breasted Chat: Insights from Western Science and Indigenous Canada — Christine Bishop, *Environment and Climate Change Canada*

11:15 Recovering At Risk Neotropical North American Migratory Landbirds in Colombia and along the Neotropical Flyway — Nick Bayly, *SELVA: Investigación para la conservación en el Neotrópico*

11:25 Western Hummingbird Partnership: Insight from México — Sarahy Contreras, *Universidad de Guadalajara – CUCSUR*

11:35 Panel: International Species initiatives recovery efforts and the incorporation of social science, co-production, and communications

Moderator: Tom Will, *Road to Recovery*

Panelists: Christine Bishop, *Environment and Climate Change Canada*
Nick Bayly, *SELVA: Investigación para la conservación en el Neotrópico*
Sarahy Contreras, *Universidad de Guadalajara*
Claudia Macías, *ProNatura Sur*

Humberto Berlanga, *CONABIO: Comisión Nacional para el Conocimiento y Uso de la Biodiversidad*
Kristen Nelson, *University of Minnesota*
Edwin Juárez, *Arizona Game and Fish Department*
Wendy Easton, *Canadian Wildlife Service*

12:20 Introduction to plenary — Paul Schmidt, *Road to Recovery*

12:25 Plenary: Cultural Ornithology and Integrative Outreach — J. Drew Lanham, *Clemson University*

12:55 Q & A Plenary: Cultural Ornithology and Integrative Outreach

1:10 Adjourn

AFTERNOON SESSION 2:00 - 4:30PM EDT

2:00 Joint ventures and species recovery introduction — Todd Fearer, *American Bird Conservancy, Appalachian Mountain Joint Venture*

2:05 Intermountain West Joint Venture — Dave Smith

2:10 Playa Lakes Joint Venture — Mike Carter

2:15 Atlantic Coast Joint Venture — Mitch Hartley

2:20 Rio Grande Joint Venture — Aimee Roberson

2:25 Panel: Eliminating the Implementation Gap

Moderator: Todd Fearer, *American Bird Conservancy, Appalachian Mountain Joint Venture*

Panelists: Dave Smith, *Intermountain West Joint Venture*
Mike Carter, *Playa Lakes Joint Venture*
Ashley Gramza, *Playa Lakes Joint Venture*
Mitch Hartley, *Atlantic Coast Joint Venture*
Chris Elphick, *University of Connecticut*
Aimee Roberson, *Rio Grande Joint Venture*
Alberto Macías Duarte, *Sonora State University*

Workshop wrap up 3:35 pm to 4:30 pm EDT

3:35 Future of R2R — Pete Marra, *Georgetown University*

3:45 Open Forum

Panelists: Pete Marra, *Georgetown University*
Ken Rosenberg, *Cornell Lab of Ornithology, American Bird Conservancy*
Paul Schmidt, *Road to Recovery*
Sarah Kendrick, *Missouri Department of Conservation*
Ashley Dayer, *Virginia Tech*
Fabiola Rodríguez, *Tulane University*
Miyoko Chu, *Cornell Lab of Ornithology*

4:30 Adjourn

SUMMARY OF TALKS

The third workshop was filled with invaluable experiences and examples from bird conservation. All talks are summarized in the following sections and they represent the foundation for a reimagined bird population recovery process.

Human Dimensions for Sustained Bird Population Recovery

The *Road to Recovery (R2R)* process aims to achieve sustained population recovery and an elimination of the conservation action implementation gap. The foundation of the process will be the inclusion of the social sciences and biological sciences in parallel along the recovery process. In order to explore how this can be done, first we describe the basics of the three key approaches of human dimensions that are considered crucial to the recovery process: **Social Science**, **Co-production** and **Communications**.

"Conservation – a Human Endeavor" by Ashley Dayer– *Virginia Tech*:

During Day 1's plenary talk, Dr. Ashley Dayer addressed the lack of "know-how" to apply social sciences in conservation issues. The concepts of social science, co-production and communication were introduced and described to set the foundation for the exploration of recovery in the context of the human dimensions.

Baltimore Oriole by Ryan Schain

Social Sciences: The social sciences are composed of *multiple disciplines* that characterize applied and classical fields such as Psychology, Policy, Geography, Sociology and more. In the R2R process and bird conservation, social sciences are those disciplines that can help us understand some of these questions:

- What *factors contribute to human behaviors* that benefit or threaten bird populations?
- What are the *livelihood impacts* of bird conservation?
- How can *policy be structured* to support bird conservation across landscapes and geopolitical boundaries?
- Which kinds of *messages and methods are effective* at changing human attitudes and actions towards birds?

"Conservation – a Human Endeavor" by Ashley Dayer– *Virginia Tech* (continued):

Co-production: An active collaborative process among individuals and entities involved in or impacted by bird conservation. Co-production has synonyms such as *actionable science* and *translational ecology*.

Co-production may mean: **co-**production of research or **co-**production of conservation strategies. Co-production should be an inclusive process and should challenge who is included (i.e. are the people impacted by conservation strategies included?).

Communications: The action of communicating with all individuals and groups involved and/or impacted by bird conservation can be informed by the social sciences. Communications strategies can be external to engage people with the bird conservation strategies and they can be internal among the researchers, conservation practitioners and users that work together for bird conservation. Communication should be rooted in dialogue instead of persuasion or one- way information transmission.

Integrate Human Dimensions Today

Connecting with a social scientist: Search online for the "Conservation Social Sciences Community Network" to connect with practitioners and researchers across the globe.

Using existing resources:

- Search online for NABCI HD committee's success stories and HDgov for North American portals that share materials on the social sciences.
- Explore existing communications' campaigns such as the 3BillionBirds.org or enquire if agencies or organizations you are working with have a communications coordinator or a communications plan.

Buff-breasted Sandpiper by Shiloh Schulte

How to Use Co-production to Tackle Bird Conservation Issues?

From exchange of knowledge to collaborative decision making, we synthesize experiences in co-production from different speakers and synthesize their recommendations on how to incorporate co-production into bird conservation.

"Translational Ecology in Practice" by Sarah Saunders–
National Audubon Society

Dr. Saunders and collaborators compiled examples of translational ecology (or co-production) in a research article: "Bridging the research-implementation gap in avian conservation with translational ecology." The six principles and goals of translational ecology are: collaboration, engagement, commitment, communication, process, decision-framing context. All six principles can be found dispersed throughout avian conservation initiatives. One example is the Smithsonian Migratory Bird Center's Neighborhood Nest Watch program where scientists and yard owners **collaborate** in a one-on-one exchange while monitoring yards, leading to a shared stewardship of the land and birds. Another example is the GoMAMN (Gulf of Mexico Avian Monitoring Network), a **decision-framing** example where goals are co-produced and decisions are taken jointly among science producers and users.

"Decision Analysis for Promoting Conservation Action" by Sarah Converse–
University of Washington, USGS Washington Cooperative Fish and Wildlife Research Unit

Decision analysis is one approach for transforming science into conservation action. It is a step-by-step process for helping decision-makers through any type of decision, and it can involve the co-production of science. Dr. Converse and collaborators have applied the decision analysis process for a wide variety of bird conservation decisions. The process includes: defining the decision problem, articulating objectives, identifying alternative actions, predicting consequences, dealing with trade-offs, deciding, taking action, and monitoring. Using a structured process can help decision-makers and stakeholders deal with the complexity that is inherent in many conservation decisions. Decision analysis has been applied to address reproductive failure in the reintroduced eastern migratory population of Whooping Cranes. As of July 2021, things are looking up for Whooping Cranes with improved reproduction in the population.

"Co-producing conservation science for social-ecological systems" by David Pavlacky – *Bird Conservancy of the Rockies*

In the Great Plains of the United States, the Conservation Reserve Program has presented an opportunity to promote bird conservation. Bird Conservancy of the Rockies (BCR) has used co-production rooted in 'renewal ecology' or socio-ecological systems theory, which translates to considering monitoring of bird species and social science jointly.

A co-production project was conducted by farmers of the Great Plains, BCR scientists, and other professionals where it is estimated that the conservation of 4.5 million birds/year can be accomplished thanks to the Farm Bill prescribed grazing and the Conservation Reserve Program's incentives.

Stewardship by Bird Conservancy of the Rockies

What Social Sciences can be Integrated in Bird Conservation?

The social sciences of conservation are represented by multiple disciplines. The discipline of social science used in a conservation effort will depend on the issue being addressed. In this section we learn from social science tools and the disciplines that have relevance in bird conservation.

"Integrating Social and Biological Aspects of Shorebird Harvest in the Caribbean to Develop Effective Conservation Strategies" by Brad Andres – *US Shorebird Conservation Partnership, US Fish and Wildlife Service*

Using the **Open Standards for the Practice of Conservation**, the Atlantic Flyway Shorebird's Initiative Harvesting Group was able to explore three different social science contexts to the problem of illegal or unsustainable shorebird harvest across their full range (from North America to South America). Considering the **policy**, **cultural** and **geoeconomic** contexts was useful to generate spatially explicit conservation actions. Studying the policy context revealed the differences in hunting policies spanning different countries and helps assess which countries have more regulations in place. The cultural context teased apart how people in these countries connect with hunting. Finally, the geoeconomics context helped conservation partners understand how economics tie to the decisions of hunting across countries, with hunting providing greater income than the minimum wage activities in many places. We learn how a large scale conservation issue benefits from studying different aspects of social sciences, in particular to understanding the geopolitical and cultural differences.

Wilson's Plover by Dennis Donohue

"Landowners & the Conservation Reserve Program: Co-producing Social Science for Bird Conservation" by Jessica Barnes – ***National Audubon Society***

The Conservation Reserve Program (CRP) in the United States provides incentives to landowners in the Great Plains to preserve habitat for grassland Birds. The monetary incentive keeps grasslands from being converted into croplands. Dr. Barnes showcased **social science research** to help answer questions like: Why do landowners participate in CRP? Do landowners want to re-enroll in CRP? What happens to fields that are not re-enrolled? What predicts grassland persistence after CRP? This study discovered that: 1) There are multiple incentives to landowner engagement (e.g. ecosystem services). 2) Discouragement to continue in the program can include low profits and difficulty to enroll. 3) There is a decoupling between the expressed interest in enrolling and actual enrollments. This social science study was co-produced by biologists, landowners and social scientists and resulted in actionable recommendations:
1) Incorporate local-level and landowner preferences and feedback into CRP design and delivery. 2) Increase support for sustainable haying and grazing. 3) Explore reasons for the bottleneck in the transition between CRP and other programs and address barriers to this transition.

"Social Science in Management of Subsistence Harvest of Migratory Birds in Alaska" by Liliana Naves – ***Alaska Department of Fish and Game***

Dr. Naves highlights the importance of social science's role in bird conservation strategies that relate to harvesting. Alaskan native peoples were affected by the Migratory Bird Treaty Act's harvest closure decision in 1918. The impact this had on native peoples clashed with the conservation goals of protecting bird populations. A century after this decision, the United States Fish and Widlife Service-Alaska Department of Fish & Game apologized to Alaska Native peoples. The lack of harvest and **socioeconomical** data was a clear gap to show that legalizing bird harvest was not a threat to the bird populations. The Government & State agencies and the Alaskan Native peoples formed part of the Alaska Migratory Bird Co-management Council (AMBCC) to co-manage the subsistence harvest program. Thanks to the research conducted by AMBCC, it is acknowledged that ducks and geese are an important component of the subsistence harvest and that migratory birds of conservation concern do not make a significant amount of the harvest.

How to Use Communications to Tackle Bird Conservation Issues?

"Atlantic Coast Piping Plover Shorebird Communications" by Meagan Racey –
US Fish and Wildlife Service, North Atlantic-Appalachian Region

The Atlantic Coast Piping Plover Shorebird Communications effort is an example of how **strategic communications** were used to reduce human-related disturbance to Atlantic Coast Piping Plovers. This communications plan was a collaborative effort where the following steps were taken: identifying the communication goal, identifying the audience, developing messages, communicating successes and evaluating the strategy. A strategic communications campaign output is content such as signage, outreach materials, social media and more.

Evaluation of a strategic communications campaign can be challenging but fruitful. For example, feedback from outreach material users can be collected and incorporated in future materials.

Piping Plovers by Kaiti Titherington

"Communications in Bird Conservation - A Case Example: 3 Billion Birds Campaign" by Miyoko Chu –
Cornell Lab of Ornithology

The 3 Billion Birds (3BB) mass media campaign is an example of how it is possible to maximize the impact of bird research for conservation.

The 3BB campaign steps included concept & planning, framing & creating, telling the story and following-up with recommended conservation actions. 3BB exemplified bringing partners in "early and often." The communications team was engaged early, when the Rosenberg et al. (2019) Science paper was still in its manuscript phase.

The team engaged often, holding constant meetings and internal communications to decide on content, stories to be shared to the audience and to propose the action recommendations that would keep momentum going. The 3BB effort has inspired new coalitions for bird conservation (such as Road to Recovery) and heightened bird conservation awareness.

"SageWest" by Hannah Nikonow – *Intermountain West Joint Venture*

SageWest was founded in 2016 by a group of communication professionals and leadership representatives (tribes, NGOs, for-profit, government agencies) in the western US in response to the no-list decision for Greater Sage-Grouse. The concerns were that momentum would be lost for conservation actions and relationships in conservation centered on this species. SageWest puts the spotlight on sagebrush ecosystem health for people and wildlife. Through strategic communications and relationships, this initiative works on internal and external communications to keep the conservation momentum for the Sagebrush ecosystem and its birds. Today SageWest has 584 participants/171 organizations that should motivate others to give communication goals in any conservation initiative.

SageWest- Sagebrush habitat by Seth Gallagher

Recovery Through the Lens of Recovery Teams and Working Groups

We synthesize the experience gained from these bird conservation efforts to highlight what new efforts can learn or improve upon and the challenges facing sustained bird recovery. **Recovery teams** as indicated within the ESA are "made up of public and private entities who develop and implement recovery plans." Importantly, Recovery teams are authorized and funded under the ESA.

The term "**Recovery teams"** in this workshop was used to describe teams that have worked on the recovery of a species in relation to the ESA to delist, down-list or avoid listing of a species. **Working groups** are entities composed of multiple partners interested in the conservation of a species. These usually are formed for species that are not yet listed by ESA and are are voluntary and non-regulatory, usually with minimal funding support

Recovery Teams

"The Fish and Wildlife Service Recovery Process" by Michelle Shaughnessy – *US Fish and Wildlife Service*

The Endangered Species Act (ESA) has been active since 1973. The Act is intended to conserve ecosystems integrity focusing on species that can serve as proxies of ecosystem health. The recovery process for an ESA listed species has three phases:

1) A pre-planning phase in which a **recovery outline** is prepared.
2) A recovery plan phase that includes the **species status assessment**, the **recovery plan** and a **recovery implementation strategy**.
3) An implementation and monitoring phase where the implementation strategy is executed with a review conducted every 5 years.

The stages a species goes through within the ESA should progress from listed, down-listed to de-listed. To get a species de-listed from the ESA requires a collaborative process that engages multiple partners in conservation, especially as the second phase of the recovery plan begins. During the recovery process, a recovery team can be formed which provides guidance on the recovery plan and ensures that the recovery implementation strategy is conducted.

Bald Eagle by Ken Rosenberg

"Road to Recovery for Kirtland's Warblers Paved by Collaborative Conservation" by Carol Bocetti – *California University of Pennsylvania*

The Kirtland's Warbler's breeding habitat was threatened by urbanization, fire regime disruption and an increase in Red Pine plantations. Once the species by listed by the Endangered Species Act, a recovery team formed to begin the process of de-listing. Dr. Bocetti stressed how a collaborative effort among many partners (management agencies and scientists) was key to start strong. The Kirtland's Warbler recovery process was not without its challenges, each of them highlighting the need for having key partners. For example, the Kirtland's Warbler habitat users included the timber companies and military personnel from a training camp. Including their objectives and goals for the shared lands into the recovery process resulted in success of implementation of all recovery strategies. The five recovery strategies used for this species were: 1) Remove Brown-headed Cowbirds from occupied stands. 2) Habitat management. 3) Monitor species via annual singing male census. 4) Research to adapt management. 5) Educate public and agency personnel.

"Lessons Learned from the Successful Recovery of the Red-cockaded Woodpecker: A Personal History" by Jeff Walters – *Virginia Tech*

The Red-cockaded Woodpecker is a cooperative breeder species, strongly associated with longleaf pine ecosystems and currently proposed for down listing in the Endangered Species Act. Their limiting factor was habitat loss due to clearing and habitat degradation due to fire suppression. Honing in to the limiting factor through basic research revealed how Red-cockaded Woodpeckers needed cavities, that even if longleaf pine habitat was present, if cavities were not, the population would not grow as these cavities take a long time to excavate and individuals would rather wait out an opportunity in existing cavities than make their own. Once the management action was identified, research was conducted to test the hypothesis of cavity availability being a limiting factor to Red-cockaded Woodpeckers, followed by applied research to monitor population response. The Red-cockaded Woodpeckers - recovery is a successful example of taking the species biology needs into account to guide management actions for recovery. To cross the implementation gap and make management actions applicable in larger scales, the following lessons were learned: integrate the goals from the users of the land (e.g. military training, timber harvest, private owner land that has family value), identify key individuals within partners that can serve as brokers and communicators, evaluate institutions' goals to avoid hidden agendas and self-serving actions, and be flexible with restrictions (e.g. safe harbor).

"The Sage Grouse Initiative: A Proven Model for Conservation of Rangelands" by Tim Griffiths – *US Department of Agriculture, Natural Resources Conservation Service*

The range of the Greater Sage-Grouse has declined by 50% and the driver of the loss is fragmentation of the Sagebrush and Grassland habitat which is caused by tree encroachment, annual croplands expansion, and ranch creation increase. The Working Lands for Wildlife (WLW) program has been an opportunity to conserve this species. The WLW is rooted on: 1) Removing threats to wildlife and improving sustainability for working lands. 2) Implementing enough of the right practices in the right places to benefit populations. 3) Assessing effectiveness, quantifying benefits, adapting program delivery, and telling the story. The Greater Sage-Grouse was threatened to be listed but avoided listing in the Endangered Species Act. Two aspects that contributed to this success were: 1) Getting the science right by identifying where the species occurs in higher concentrations to target these areas. 2) Making the conservation a joint effort to restore rangelands including private land owners, the Bureau of Land Management, scientists in Universities, and other agencies. After 12 years of work, applying management actions to targeted areas identified by science, the Greater Sage-Grouse population is growing and approximately 8 million acres of Sagebrush & Grassland habitat has been restored.

Working Groups

"Golden-winged Warbler Recovery: Perspective from the Golden-winged Warbler Working" by Amber Roth – *University of Maine*

The Golden-winged Warbler Working Group (GWWA WG) was founded in 2003. To this day it is an initiative that encompasses 200 members from the breeding and non-breeding range of the species. The activities conducted since 2003 show an example of co-production which included a series of workshops across the full range of the species to generate a full annual cycle conservation plan. This species in need of recovery is being reviewed for possible protection under the US Endangered Species Act. The GWWA WG has undergone an organization structure shift recognizing the importance of the following actions:

1) Improving collaboration and leveraging resources.
2) Improving communication with key implementation partners.
3) Improving and developing new markets for sustainably harvested products.
4) Securing new sources of funding especially from the private sector.
5) Moving beyond a narrative of declining birds to include the contribution of birds to nature, their importance as ecosystem services providers, and more.

"Road to Recovery-Conserving the Saltmarsh Sparrow" by Aimee Weldon – *Atlantic Coast Joint Venture, US Fish and Wildlife Service*

The Saltmarsh Sparrow is a species in need of recovery, threatened by climate change drivers such as sea-level rise. The Atlantic Coast Joint Venture (ACJV) is a partnership between federal agencies, state agencies, non-governmental organizations and academia. The ACJV focused on creating the science building blocks to drive conservation of the species and its habitat. First, the 10+ years of research compiled and conducted by the Saltmarsh Habitat & Avian Research Program served as a starting point. Second, the ACJV compiled the need of partners. Third, the ACJV worked together to address the needs of partners. The results were a bird population target per state, identification of where the work is needed and how much salt marsh habitat would be required, and conservation strategies that delineate actions.

Lesser Prairie-Chicken by Greg Kamos/USFWS Mountain Prairie

Saltmarsh Sparrow by Matt Tillett

"Recovery of Prairies, People, and Chickens Too: Moving the Needle with Voluntary Conservation" by Christian Hagen – *Oregon State University*

The Lesser Prairie-Chicken Initiative (LPCI) is 10 years old. The Working Lands for Wildlife Program has been key to LPCI because 95% of the range for this species is privately owned and large-scale factors that modify the landscape are influential for this species. Human dimensions integration was necessary to understand how to maximize participation and engagement of landowners.

Through the social science research conducted, LPCI learned that local people in positions of outreach and implementation are key to engage landowners and get their support.

The LPCI incorporates the following to their work:

1) Focus on landscape drivers.
2) Consider needs and motivations of landowners.
3) Appreciate and support implementers as key partners in the conservation strategies.

"Tricolored Blackbird Working Group" by Neil Clipperton – ***California Department of Fish and Wildlife***

The Tricolored Blackbird Working Group (TBWG) was formed in 2004, by 2007 a Species Conservation Plan was created and members of the working group signed a Memorandum of Understanding. The low breeding productivity that is influenced by dairy activities is considered a limiting factor for the species. Once this limiting factor was identified, the TBWG membership worked together with all of its membership including landowners, trade organizations involved in dairy production, biologists and agencies. The process in place involved a pipeline of Tricolored Blackbird colony protection that included outreach, detection of colonies, enrollment in colony protection programs through incentives and monitoring. Thanks to the working group partnership for colony protection, an increase in breeding productivity is being observed for the Tricolored Blackbirds in California.

"Pinyon Jay Working Group" by Scott Somershoe – ***US Fish and Wildlife Service***

Around 2015 WG started with 25+ conservation partners. A conservation strategy was started. In this strategy the knowns and unknowns were identified, research needs, recommended conservation actions taken. The activities of early years includes a lot of outreach and engagement with partners. The challenges for Pinyon Jay work are the unknowns which are significant (limiting factors) as well as filling gaps while maintaining engagement of diverse partners. The next steps include the development Pinyon Jay work that can be incorporated in the landscape planning that has a focus on other species (e.g. sage grouse).

Mesa Verde National Park by National Park Service

"Road to Recovery-Conserving the Eastern Black Rail" by Aimee Weldon – ***Atlantic Coast Joint Venture, US Fish and Wildlife Service***

The Black Rail is a federally threatened species and alongside the Saltmarsh Sparrow is considered a focal species to the Saltmarsh habitat of the eastern US. The knowledge gaps for this species are large with expert opinion posing sea level rise due to climate change as one of the threats that could be driving declines. Through the same expert opinion by conservation partners and the Atlantic Coast Joint Venture, habitat manipulation was identified as an action that needs to be implemented and avoid more precipitous declines. The next steps for the work on this species include learning how to create rail habitat, obtaining the resources and capacity to create habitat and obtaining more buy-in and support from conservation partners.

Black Rail by Bob Gress/Atlantic Coast Joint Venture

Lesser Yellowlegs by Brad Winn

"Turning the Tide: Implementing Solutions that Benefit the Lesser Yellowlegs" by Jim Johnson – ***US Fish and Wildlife Service***

The Lesser Yellowlegs is a species with a large full annual cycle range in the Western Hemisphere. The unsustainability of the harvest of this shorebird has been identified as the potential limiting factor. Researchers working on this species revealed that adult individuals belonging to the eastern Canada breeding region have a higher probability of exposure to harvest. In order to work alongside conservation partners and generate harvest programs that are sustainable the next research steps for the species include the estimation of seasonal vital rates and an Integrated Population Model (IPM) that can reveal other limiting factors.

"International Rusty Blackbird Working Group" by Carol Foss –
Audubon Society of New Hampshire

The Rusty Blackbird is a species that spends its full life cycle in North America. Climate change is the hypothesized main driver of decline for this species. The International Rusty Blackbird Working Group (IRBWG) was founded in 2005, composed of a steering and executive committee that involves different conservation partners such as state/provincial and federal agencies, and scientists. Two of the activities that have been conducted to date include a Blitz (citizen science supported bird count) to determine the location of important sites for the breeding season and migration of the Rusty Blackbird and the development of habitat management guidelines for areas of the northeastern US. Future activities for the IRBWG will include habitat management in more areas of the wintering range and stopover locations.

Insights from the Recovery Teams and Working Groups

The experiences shared for three species Recovery Teams and eight species Working Groups is synthesized in page 45 with valuable lessons and a critical challenge that has not been fully addressed by the bird conservation community. But first, if you wish to learn more about working groups to get ideas on how to start one, explore the **Partners in Flight** portal links to connect with the Eastern and Western Working Groups. Learn from others! https://partnersinflight.org/working_groups/

Red-cockaded Woodpecker by Julio Mulero

Quick Tip: How do I know who to bring in to start a working group?

- Learn about "stakeholder analysis," a strategy for identifying partners.
- Identify who else shares the land with the bird species: agencies, communities, private companies.
- Reflect on who will be the implementer of recovery strategies, to begin identifying shared goals.

Insights from Multi-country, Multi-cultural Efforts: a First Step to Scale-up Bird Recovery Across Geopolitical Boundaries

While the focus of the recovery work conducted has focused on many US examples, recovery for many species at risk will need to be conducted across geopolitical borders. The challenge of scaling up co-production, human dimensions and communications work when there are multiple languages, socioeconomic and cultural differences is one that always must be kept in mind and that the bird conservation community needs to continue addressing. During the workshop, conservation partners from Canada, Mexico, and Colombia shared insight on how the efforts to recover populations of bird species at risk are embedded in broader ecosystems and improving human livelihoods.

Yellow-breasted Chat by Mick Thompson

"Recovery of the Yellow-breasted Chat: Insights from Western Science and Indigenous Canada" by Christine Bishop – ***Environment and Climate Change Canada***

The Yellow-breasted Chat in the Okanagan Valley of Canada reflects a success story for localized population recovery with a growth of 25 to 254 breeding pairs estimated during 2001-2019. The success was the result of a partnership that extended its reach outside of the Okanagan Valley. In 2017 the Bird Conservation Research Group for the Yellow-breasted Chat was formed. In the breeding grounds this group included the indigenous peoples groups such as the En'owkin Centre, the Osoyoos Indian Band, the Lower Similkameen Indian Band and the South Okanagan Similkameen Conservation Program. The breeding grounds partners also included the British Columbia Ranchers and Klamath Bird Observatory. In the nonbreeding grounds partners included the San Pancho Bird Observatory, Tierra de Aves A.C. and Universidad de Guadalajara. The group embarked on species specific research to understand threats, full annual cycle ecology and to generate a recovery strategy. Through Habitat Stewardship Funds it was possible to meet different partners' need: areas for Chinook Salmon and protecting water quality. What started as a local effort to recover Yellow-breasted Chat grew into an across border effort that encompasses multiple views, cultures, and needs. Next steps include working on management of mid-succession riparian habitat and mitigating the impacts of climate change.

"Conserving and Creating Migratory Bird Habitat on the Neotropical Non-breeding Grounds" by Nick Bayly – ***SELVA***

When we think about the challenge of working across borders to recover migratory birds, we may wish to think first about the roadblocks that hinder the local engagement. For example, in areas in which research design and implementation are led mainly by North American institutions, buy-in and prolonged engagement may be low and recommendations may lack local context. An avenue to engage local participation that has lasting buy-in should consider championing young professionals of all backgrounds, with strong interest in birds to shape and be part of the initial knowledge filling gaps stage. Funding in-country Masters and PhD programs and providing assistance with tiered funding programs to help people build a career sets the stage for a more equal and sustainable bird recovery co-production process. SELVA has been involved with co-production in Colombia to generate non-breeding habitat for migratory birds. The co-production partners include entities that represent the communities and private landowners who have an important role in the determination of which activities are considered important for both the generation of habitat and their livelihoods. The co-production principle followed is the local needs, with several activities underway to expand the habitat of migratory birds.

"Western Hummingbird Partnership: Insight from México" by Sarahy Contreras – *Universidad de Guadalajara - CUCSUR*

The Western Hummingbird Partnership (WHP) was created to maintain a thriving hummingbird population in habitats across North America. The Rufous Hummingbird is a species at risk for which a project was started to strategize around its threats related to disturbance of habitat and fires. The success of this project which began in 2017, in a country as culturally diverse as Mexico, was founded in a strong social approach. Cultural values were taken alongside biodiversity values to engage communities, academics, and government agencies, as conservation partners. The activities of this project included working with land managers, implementing prescribed fires and post fire restoration techniques, examining synchrony and asynchrony in the phenology of flowering plants after fire management, and considering the cultural implications of fire management for benefit of other protected areas. The WHP is currently working on evaluating the success of the program by quantifying the benefits to habitat, hummingbirds and communities. An interesting aspect of the project is that the work was ignited by broader landbird community interest from Partners in Flights on Western Forests and Tropical Deciduous Forests that sustain many migratory landbirds.

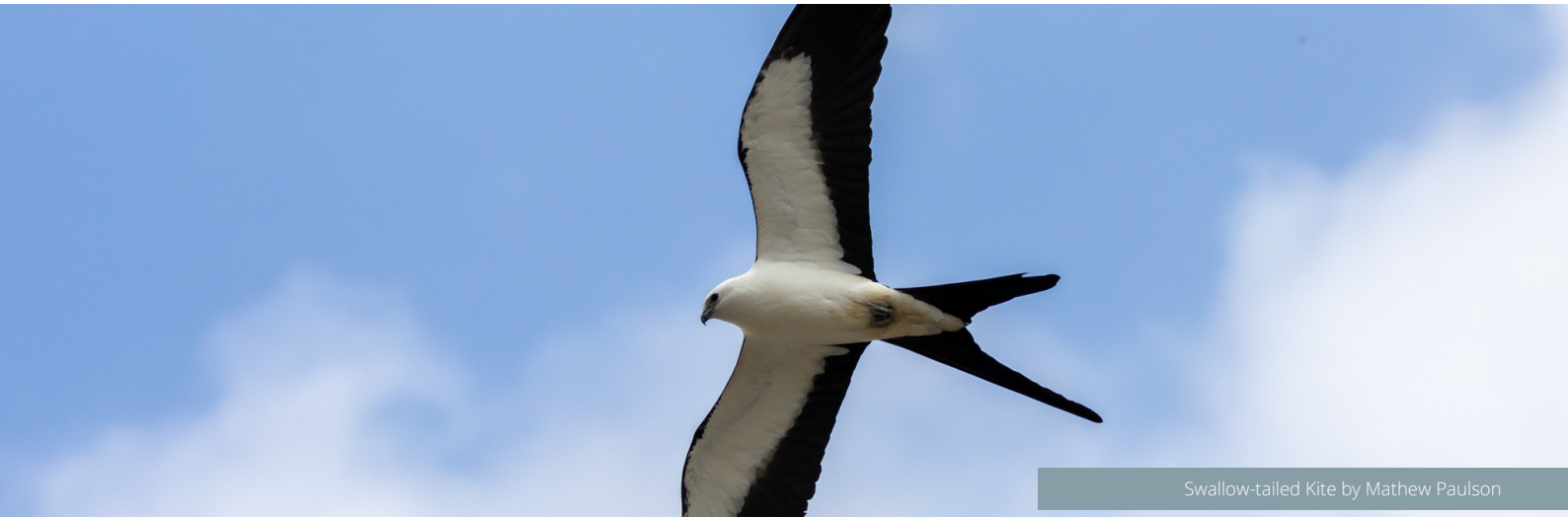
Rufous Hummingbird by Mick Thompson

Cultural Ornithology and Integrative Outreach

"Co-production: An Introspective of Triangulation on Three Decades of Bird-Adoring Work" by Drew Lanham – *Clemson University*

Drew Lanham shared that he considers Academia, Advocacy and Activism as three qualities or foundational aspects to embark in an inclusive co-production process. People's well-being cannot be separated from bird ecology and conservation, as learned from Range Mapping. As scientists learn about the extent of a bird species range and its niche within this range, they can also map human dimension indicators such as predation risk by police, food availability (e.g. food deserts), habitat suitability based on climate change threats and more. When the bird species ecology and human needs are overlaid, we learn about the realities and magnitude of the conservation efforts that will be needed.

A range mapping example shows how there is convergence of the habitat and Black communities. Another example shows the convergence of important bird habitat and Hispanic/ Latin American communities. These communities are minorities in the US conservation and birding realms, but they hold major bird appreciation and conservation ideals that need to be recognized. From the birding community in Allentown, South Carolina, to the organization of Black Birder's Week, we see proof that thinking boldly about how to change bird conservation and recovery will mean coming together within the bird conservation community. Dr. Lanham invites us to take a Pledge to Work for Nature in which he reminds us that "Consideration of better for wild birds, humanity and our inextricably linked Ecologies is more than worthy work, it is mission."



Swallow-tailed Kite by Mathew Paulson

Joint Ventures: Perspectives for the Elimination of the Implementation Gap

Joint Ventures (JVs) are entities organized to work in partnerships on the conservation of birds and landscapes. JV partners are diverse and range from local government, state agencies, federal agencies, NGOs and academic institutions. The Migratory Bird Joint Ventures operate as regional partnerships that cover multiple US states, regions, even across nations. We learn from the efforts of four different JVs to conserve birds.

"Atlantic Coast Joint Venture" by
Mitch Hartley - *ACJV* & Chris Elphick - *University of Connecticut*

The Atlantic Coast Joint Venture was initiated with the interest to conserve saltmarsh habitat from the coast of Maine in the US south to the tropical mangrove swamps and coral reefs of Florida and Puerto Rico; and from the Appalachian Mountains to the Atlantic Coastal Plain. The flagship species are Black Rail, Saltmarsh Sparrow, and Black Duck. The efforts of this JV began with science thanks to the work of the Saltmarsh Habitat and Avian Research Program (SHARP). SHARP worked to understand population dynamics of saltmarsh bird species to prompt management actions. The work of the ACJV requires engaging entities such as the Environmental Protection Agency, the Army Corps of Engineers, the National Oceanic and Atmospheric Administration, and state agencies. Conservation work for the recovery of these species and their habitat requires overcoming challenges. A few examples include working within the law to restore marshes and engaging private landowners around marshes. More information: https://acjv.org

Salt marsh landscape by USFWS

"Playa Lakes Joint Venture" by Mike Carter & Ashley Gramza

Playa Lakes Joint Venture (PLJV) works to conserve the playas, prairies and working landscapes of the western Great Plains. The PLJV focuses on these landscapes to conserve and restore wetland and grassland habitats that support shorebirds, landbirds, waterfowl and waterbirds. PLJV's conservation work is founded on understanding how conservation actions that support ecological goals are relevant to and also help the people who work and live in this region. Throughout their journey, PLJV has conducted multiple surveys, focus groups, and workshops to learn what is relevant to landowners across six states and used that information to create successful private lands conservation programs. Integrating this social science data into communications and conservation delivery resulted in the conservation and restoration of 12,000 acres in playa ecosystems -- more than the acres conserved in the prior 25 years -- through a FSA State Acres for Wildlife Enhancement program that uses a reverse auction process where farmer's indicate the rental rate they are willing to accept to participate in the program. Finding relevancy leads to successful habitat conservation at larger scales, and PLJV recommends using social science as a way to listen to key audiences and create conservation programs that are relevant to them. More information here: https://pljv.org

Mixed-grass Prairie in the Bowdoin WMD by Douglas B. Barbour/USFWS

"Intermountain West Joint Venture" by Dave Smith

The Intermountain West Joint Venture encompasses the several ecosystems such as wetlands and sagebrush. IWJV extends from Washington in the North of the US to New Mexico in the south. Landscape habitat changes are at the root of the declines of many species, indicating the need for a faster response and scaling up of habitat conservation. During 2012-2016 the IWJV worked on sage-grouse conservation; today the focus is on how conservation can help multiple sagebrush obligate birds. While conservation of habitat has been successful, new challenges arise such as climate change. IWJV is confident that the partnership assembled which includes the landowners that enable the management actions, will provide an opportunity to influence bird populations positively. More information here: https://iwjv.org

"Rio Grande Joint Venture" by Aimee Roberson - *RGJV* & Alberto Macías Duarte - *Sonora State University*

The Rio Grande Joint Venture (RGJV) is a binational entity that works to conserve birds and wildlife in the Chihuahan Desert, Tamaulipan Brushlands and the Gulf Coast Prairie. The Chihuahan Desert Grassland conservation strategy has been a high priority for the past four years and it works to protect a suite of birds in decline such as the Sprague's Pipit, Baird's Sparrow, Chestnut-collared Longspur and Thick-billed Longspur. The goal of the strategy is to improve and increase grassland habitat and work is conducted with US and Mexico partners in coordination with the Sonoran Joint Venture and IWJV. Partners of the RGJV are developing a tool to help implementers determine how much habitat and which attributes (grass, forbs or shrub cover) would positively influence bird species. Implementers could use this tool at a local scale jointly with landowners or other land users' considerations as well as at a grassland ecosystem scale. More information: https://rgjv.org

SYNTHESIS FOR FUTURE CONSIDERATIONS

The third workshop was an opportunity to gather experiences in bird conservation that included social sciences, co-production and communications. In the next pages, a synthesis from the panel discussions that may serve as guidance for bird population recovery work.

Rio Grande River by Ryan Moehring/USFWS

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.

2.NAVIGATE BIRD CONSERVATION WITH AWARENESS

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.

3. EMBRACE THE PROCESS AND CHALLENGES OF INCORPORATING SOCIAL SCIENCES

If you are an independent researcher, reflect on how social sciences interact with the biological sciences. See page 11 for resources to explore.

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?

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

VALUABLE LESSONS

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.

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.

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.

- 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.

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)
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Link to Recordings: https://marralab.com/r2rpart3/

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