WORKSHOP REPORT

"Towards integrating multiple Joint Venture-scale objectives to achieve NAWMP goals: Lessons learned"

Memphis, TN, USA, February 2015

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EXECUTIVE SUMMARY

- In February 2015, the NAWMP Science Support Team (NSST) and Interim Integration Committee (IIC) met jointly in Memphis, TN, and began to explore ways of integrating objectives for waterfowl habitat and people, the latter including hunters, other conservation supporters and the general public.
- Participants were exposed to approaches and efforts attempting to integrate habitat-human objectives and monitor responses and progress toward integration, and were actively engaged in generating and summarizing ideas.
- Defining the "problem set", i.e., explicitly specifying the linked habitat-people objectives and associated management decisions, was challenging. Yet, all groups managed to make progress, and identify trade-offs associated with decisions that could most benefit birds, people or both target groups.
- Concerns were expressed about high levels of uncertainty with regard to assumptions and trade-offs involving human values. Participants also recognized that many opportunities exist for integrating objectives for habitat, hunters, viewers and supporters but noted that progress may be slow due to knowledge gaps and limited JV capacity.
- Nonetheless, participants acknowledged the tremendous values of dialogue, identifying challenges (and possible solutions), exposing their "beliefs" in a more explicit manner, and specifying potential benefits of developing and maintaining support for wetland and waterfowl conservation. Waterfowl management programs and practices are interrelated, and the workshop helped to reveal the obvious and often not so obvious relationships among decisions within and across programs.
- Recommendations for continuing progress on integration include:
    - Obtain institutional (e.g., JV) support and engagement in the process.
    - Develop tangible examples at relevant management scales.
    - Plan well in advance and involve key stakeholders – invite multiple disciplines relevant to the management problem.
    - Focus on a limited number of objectives and management decisions of high relevance to JVs.
    - Recognize that the process will involve multiple steps, review and refinement over time.

INTRODUCTION

The 2012 NAWMP Revision marked a significant shift for North America's waterfowl conservation and management community (http://nawmprevision.org/). The revision process revealed that an enhanced understanding of the linkages among three main elements - *waterfowl populations, their habitats, and people* - will be needed to sustain waterfowl and habitat conservation. Subsequently, revised objectives for waterfowl populations and waterfowl supporters were developed in 2014. The immediate challenge is to begin explicitly linking these objectives to refine or derive regional or Joint Venture (JV) habitat objectives and associated conservation strategies. ***Regional variation in these three elements and their inter-relationships across the annual cycle of waterfowl necessitates regionally-based integration and planning approaches.*** This is because each JV partnership is defined by unique characteristics, including ecological, cultural, and socio-economic features. In February 2015, the NAWMP Science Support Team (NSST) and Interim Integration Committee (IIC) met jointly in Memphis, TN, and began to explore ways of integrating objectives and corresponding management actions for waterfowl habitat and people, the latter including hunters, other conservation supporters and the general public. No specific consideration was given to harvest management, but there was considerable discussion about the role of habitat in providing opportunities for hunters and viewers to access waterfowl, while ensuring adequate access to these habitats for waterfowl.

Before this Workshop was held, a steering committee composed of NSST and IIC members developed objectives and approaches to facilitate discussions about integration (Appendix 1). A great deal of thought went into preparing for the Workshop, over a period of several months, and we anticipate that advance preparations like this will typify most JV engagement on this topic. General Workshop goals were to:

1. Identify and discuss management decisions that most require consideration of multiple objectives.
2. Use hypothetical JV examples to explore the process of specifying linked, measureable objectives for habitat, populations and human dimensions, their functional relationships, assumptions, and trade-offs.
3. Expose participants to approaches and efforts attempting to integrate objectives and monitor responses and progress (e.g., models, maps, consequence tables, decision trees, influence diagrams).

The broad purpose of this report is to document the steps taken toward integration at the Workshop, to share the lessons learned and to suggest approaches that could be helpful in the future as JVs continue to address the challenges associated with integration.

WORKSHOP – APPROACH (METHODS)

Before the Workshop, participants (see Appendix 2) were advised about the objectives and structure of the Workshop. They were also given general descriptions of three hypothetical JVs that are characteristic of those found in high density waterfowl breeding areas, and high and low density non-breeding areas (Appendix 3 - A, B and C, respectively). The purpose of having examples of generic JVs was to help focus discussions on the topic of integration without explicitly referencing a specific JV (i.e., by providing basic information about people, socio-economics, waterfowl habitat, birds and conservation challenges).

The Workshop began with a series of presentations designed to provide context about the NAWMP Revision recommendations concerning integration, and subsequent work by the IIC. These also informed participants about recent progress, emerging ideas and concrete examples about how specific JVs have addressed integration issues, specifically with respect to people and waterfowl habitat.

During the NAWMP 2012 Revision process, important lessons emerged from attempts to develop a unifying decision analysis for the full integration of multiple objectives. Such an approach appeared to be impossible; simply put, there are too many decisions being made by numerous agencies at several spatial scales and time steps for a single unifying framework to be feasible. However, since the NAWMP Revision Action Plan was released, the IIC has made some progress in inventorying the recurring decisions made by waterfowl managers at multiple scales (Appendix 4 [Source: D Humburg]), and articulating the scales and kinds of objectives that might be effectively integrated (Appendix 5 [Source: MG Anderson]). Integrating objectives for people and habitat at the JV (or regional) scale was identified as an approach where progress has **already** been made and could be enhanced further (Appendix 6, [Source: MG Anderson]). Notwithstanding the complexity depicted in Appendix 6, JV/regional scales seem especially important for linking habitat and user/supporter objectives and actions. This Workshop was intended to continue this kind of dialogue and the process of moving towards greater integration at the JV scale

Some jurisdictions, such as Missouri, have experience in setting and integrating objectives for waterfowl, habitat and hunters (Appendix 7). Missouri also monitored progress towards achieving its objectives, was able to demonstrate success, and has recently assessed and revised its overall approach as part of an on-going program review. In broad terms, Missouri's experiences suggest that successful integration of multiple objectives requires early and continuous engagement of relevant stakeholder groups, rigorous assessment of assumptions and objectives, planned monitoring and evaluation, and an organizational culture that supports such an initiative.

Recently, Nebraska Game and Fish and DU Inc. has been actively engaging a wide range of stakeholders to help shape its habitat objectives for wildlife and people. This initiative is using

decision analysis and other techniques to evaluate how different investments in habitat acquisition, public outreach, landowner relations, and available habitat (access) might influence conservation participation, success of endangered species recovery and waterbird population objectives (Davis, J, K Carrlson, B Krohn, M Reddy, K Schroeder, G Stoebner, B Taddicken, M Vrtiska, P Devers, E Irwin & I Bronson. 2015. Balancing social and ecological objectives at a landscape scale: The Platte River Watershed Case Study. Report, Structured Decision Making Workshop, June 2014.) The RBJV's experiences indicate that the decision analysis is more effective when there is a sharp focus on the most critical decisions and those made at smaller spatial scales (i.e., the most important issues of greatest relevance to people).

These two examples clearly illustrate that the NAWMP community has the desire and capability to proceed with integration. Furthermore, they provide illustrative examples that should be communicated to the entire JV community. Therefore, in this summary, we have interwoven the lessons learned from these processes with those emerging from the Memphis Workshop.

WHAT DID WE LEARN AT THE MEMPHIS WORKSHOP?

General points

The types of discussions held at the Workshop are integral to the process of considering multiple objectives. Based on our experience, the waterfowl community should continue to invite multiple disciplines to waterfowl management discussions. In some respects, simply the willingness to have the discussion about integrated waterfowl management is a reflection of growth in the waterfowl conservation community. In the future, including additional stakeholders is also important – even though it adds complexity, more notably, it adds relevance.

We also learned that the process is important - the organizing committee spent considerable time "choreographing" the process. Furthermore, documenting the process is crucial – fruitful discussions must be documented so as to take advantage of experience the next time the same discussion occurs. There is little sense in having the same conversation over without benefit of previous outcomes. Capturing the discussions in a manner that can be visualized is valuable, accompanied by a narrative description.

Finally, setting a clear decision context is foundational. Focus first on specifying the decision problem you are trying to inform - the more explicit, the better. This includes identifying the specific objectives as well as the nature of the decision being made.

Specific issues arising

The Workshop break-out groups focused on characteristic JVs (Appendix 3), reported their discussions during the concluding plenary sessions, and these were subsequently summarized for

the breeding JV (Appendix 8), and high (Appendix 9) and low (Appendix 10) density wintering JVs. The following represent the dominant "take-home" messages distilled from these summaries.

Each group found it challenging to define the "problem set" (i.e., to specify the linked habitat-people objectives and associated management decisions). To ensure tangible progress and expedite Workshop discussions, the organizing committee developed prior to the workshop a suite of candidate objectives for each characteristic JV. However, even with candidate objectives pre-identified, workshop participants often found it necessary to modify these to better suit the decision problem of interest. Nevertheless, all groups managed to make progress, and identify trade-offs associated with decisions that could benefit birds versus people and vice versa. From the beginning, it is important to recognize the inherent interconnectedness of decisions regarding habitat conservation. Whereas it is possible to consider simultaneously three components in the decision process, i.e., habitat, populations, and users, working on just two of these may be adequate at times. By working through the hypothetical JV situation, it became obvious that seemingly simple challenges are often not simple in practice (e.g., see influence diagram, Appendix 9); however, capturing the range of challenges in this explicit way is an important and significant step forward.

Concerns were expressed about the levels of uncertainty with regard to assumptions and trade-offs involving human values. We need (new) information about these values, which could involve new social science research or hiring people with this knowledge. For most JVs this would involve the acquisition of new skill sets. Importantly, these early discussions at least need to capture the beliefs or hypotheses about habitat management influences on human values that may have been implied but rarely acknowledged explicitly.

Participants recognized that many opportunities for integration exist among objectives for habitat, hunters, viewers and supporters, but noted that progress will likely be slow. Currently, JVs have limited capacity and resources to achieve habitat objectives alone, and the pay-offs associated with planning and implementing for multiple objectives are unknown. Yet the premise of the 2012 NAWMP is that such resource synergies among these objectives exist. While modest steps towards integrated decision-making are underway among segments of the waterfowl community, widespread and continued adoption may well depend on demonstrating the efficiencies gained through this process. Yet this remains a key challenge, as limited attention has thus far been given to identifying how best to measure the success of integration efforts.

Notwithstanding these concerns, participants acknowledged the value of dialogue, identified challenges (and possible solutions), and potential benefits of developing and maintaining support for wetland and waterfowl conservation. They benefitted from the dedicated focus, breakout group interactions, and workshop discussions. This level of focus and information sharing would not have been effectively completed without a dedicated workshop. Waterfowl management programs and practices are interrelated, and the workshop exercise helped reveal

the obvious and often not so obvious relationships between decisions within and across programs. Moreover, the concepts of "opportunity costs" and tradeoffs related to use of resources to achieve one objective vs. another objective, as well as complementary approaches where more than one objective could be realized, were informative discussion topics.

Broad Learning Experiences to Date, and Recommendations to JVs regarding the Process of Integration

Discussions held at the workshop strongly reinforced assumptions about the need to approach integration at regional scales (e.g., State or Joint Venture) if we are to be successful in achieving multiple NAWMP goals (populations, habitat, people). A primary outcome at the end of this workshop was an acknowledgement and commitment by most participants to advance regional scale integration, acknowledging such efforts could take a variety of forms and at different spatial and temporal scales. A key recommendation was to encourage JVs to use local or regional scale workshops as a meaningful first step for exploring opportunities regarding integrated decision-making within their JV partnerships. As such, we provide below a synthesis of key elements learned from the Memphis Workshop. The primary goal of this synthesis is simply to share key lessons learned and challenges faced during this process to serve as an aid or building block for JVs as they begin to navigate NAWMP integration within their partnerships. We anticipate the information below will be useful to JVs and the NAWMP enterprise.

The Planning Process

- Planning for a JV integration workshop should begin well in advance of the proposed meeting date(s).

- One meeting or workshop will be insufficient; plan out a full stepwise process for achieving integration, and what steps and time frame this will require. Be prepared to modify these plans after each meeting.

- Institutional support is crucial. Ensure that your JV management board supports the full process. A focus group or team could lead the development of the workshop and ideally should include some management board members. Consult with your JV management board prior to finalizing the workshop content, structure and participants to ensure that it supports the proposal.

- Early identification of the management issues and engagement of key stakeholders are essential. Frame up the (multiple) decision context, then identify the key target groups. Defining the decision context may require a separate process, completed before an integration workshop is held. Bring relevant stakeholders (e.g., representatives of land-owner, hunter and[or] other conservation groups) or decision-makers to the process <u>early</u> and get their ideas. This will help

build support and increase relevance. Be sure to include field managers who make decisions at scales relevant to the planning process. This is NOT an exercise just for scientists!

- Set realistic, achievable workshop objectives. Select a *limited* suite of appropriate integration issues. Do *not* try to accomplish too much in one session. Allow a lot of time for dialogue and ideas to emerge, as the Memphis Workshop revealed there is much value in exploratory dialogue. Invite the correct mix of people (target audience; skill sets).

- Distribute relevant background information to participants before the workshop, such as a narrative describing context, objectives, intended outcomes and structure of the workshop. Include an explicit description of what you view "integration" is and is not, in the context of JV planning. This could include relevant examples of how the process has been applied elsewhere (these should increase in number and successful application over time).

- Select a facilitator who is familiar with the regional issues, relevant disciplines (e.g., cultural, socioeconomic and ecological contexts), and has experience. An informed but objective facilitator is a must. Members of the NSST and/or IIC who participated in the Memphis Workshop may also serve as resources for pre-planning work, and possibly at the workshop.

Integrating Management Decisions and Other Steps

- Consider the sequence of steps needed to achieve successful integration.

- Start with an appropriate scale, one that is sensible and also makes the decision matrix simpler and relevant. Identify the recurring management decisions and associated management actions that most require joint consideration (i.e., integration). Specify the types of decisions being made, their controllability (and other uncertainties), and anticipated outcomes.

- Identify a few key decisions that your JV would often make (these could be identified and developed in the pre-workshop planning phase described above).

- Express beliefs (assumptions) about how the system(s) works, and how desired objectives interact with each other, i.e., state the trade-offs. Capture these ideas visually, if possible, with a conceptual model or simple diagrams to document the current process and form a starting point for the next discussion.

- Consider developing a consequence(s) table as used in structured decision making.

- Document what you did – the process and outcomes, much like we have attempted here.

CONCLUDING REMARKS

Each JV is unique, featuring distinct social, socio-economic and ecological characteristics. Thus, the management challenges, appropriate management tools, and solutions to the most pressing conservation issues must be specifically tailored to each JV's context and issues. Through exploration of the integration process with real JV scale scenarios we hoped to better familiarize ourselves, as a community, with approaches toward integration, thus improving our comfort with the process and bolstering confidence to initiate integration in our JVs. Indeed, NAWMP/NSST/IIC should encourage and facilitate JVs actually exploring integration in a tangible way, and then documenting or reporting on their experiences and progress to facilitate learning by other JVs and building collective JV synergies.

Dialogue around the process of integration forces JVs to express their beliefs (assumptions) about the linkages between people and habitat (birds), i.e., develop hypotheses and associated predictions about how their system function. In turn, this leads to a more explicit understanding about how these linked decision processes play out at various scales, and also helps identify ways of monitoring progress and adapting approaches over time. Eventually, as the adaptive journey proceeds, this will trigger questions about whether the JV is organized correctly and if the correct people are at the table.

JVs are encouraged to engage their management board and technical committees regarding integration and to explore processes for sharing and communicating JV integration experiences, in order to facilitate JVs learning from each other. In this regard, NSST members (science staff) should also be encouraged to consider ways of communicating lessons learned and integration progress to JV coordinators and through the NSST.

It is "ok" for each JV to approach integration as it deems most appropriate (i.e., given ecological/socio-political circumstances). While this "guidance" may seem obvious, stating this could help alleviate some apprehension. Integration will look different across JVs, in some cases messy, and may be challenging to "roll-up" to a continental scale. Some integration approaches are inevitably likely to fail but that is part of the process.

We anticipate decisions that consistently require (across geographies) consideration of multiple objectives will begin to emerge, and we anticipate that these could eventually be considered "recommendations" for JVs. Alternatively, for decisions that are more geographically focused, a good deal of energy and preparation should be devoted to exploring these integrated decision constructs with stakeholders.

Finally, we are in the early stages of a process that will continue for some time. It will be iterative; we will make progress, then review and refine over time. At times, it will be difficult – be aware of this - but do not become discouraged. The most appropriate integration steps with respect to key decisions will emerge, as will practical ways of successfully integrating multiple objectives for habitat and people, for the enhanced benefits to both.

APPENDIX 1 - **Workshop description, objectives and general methodology.**

Workshop, "**Taking steps toward active integration of habitat, waterfowl population and human dimensions objectives at JV/regional scales**"

Ducks Unlimited Headquarters, Memphis, TN, 10–12 February 2015

The 2012 NAWMP Revision marked a significant point in North America's waterfowl conservation and management enterprise. It identified that an improved understanding of the linkages between 3 core elements **(waterfowl populations, their habitats, and people)** will be required to sustain waterfowl for future generations. Consequently, integrated objectives among these 3 elements are needed to guide the waterfowl conservation and management community.

Recently, revised objectives for waterfowl populations and waterfowl supporters have been developed. The immediate challenge is to begin explicitly linking these objectives to refine or derive regional (JV) habitat objectives and associated conservation strategies. Regional variation in these 3 elements, and their inter-relationships, across the annual cycle of waterfowl necessitates regionally-based integration and planning approaches. The purpose of this report is to document steps taken recently to begin this integration process, to explain lessons learned and suggest approaches that could be helpful in guiding integration.

General objectives:

1. Identify and discuss management decisions that most require consideration of multiple objectives.
2. Use hypothetical JV examples to explore the process of specifying linked, measureable objectives for habitat, populations and human dimensions, their functional relationships, assumptions, and trade-offs.
3. Expose participants to approaches and efforts attempting to integrate objectives and monitor responses and progress (e.g., models, maps).

Anticipated outcomes:

1. Greater familiarity and comfort with approaches for integrating multiple objectives and considering their trade-offs.
2. A better understanding of the suites of human dimensions outcomes that could be achieved via implementation of conservation-based habitat programs and land use policies.
3. A more explicit explanation and depiction of the putative relationships between program or policy implementation and anticipated bird population or hunter/societal responses.
4. Review of conceptual and quantitative tools used to integrate multi-faceted information at different spatial scales.
5. Provide a point of orientation from which the NSST mapping committee can navigate.

Challenge: Components of integration need to be made more explicit in terms of how habitat program/policy can be integrated with objectives for waterfowl populations and people at the scale of JV/regional planning.

Feb 10

8:00 General organization for the day - Bob Clark

8:20 Session 1 – NAWMP Revision and the challenges of integrating multiple objectives in management decisions at relevant scales

Facilitators: Dale Humburg (DU) and Mike Anderson (NAWMP Plan Committee)

This session will provide an overview of the NAWMP community's endeavors to delineate linkages among NAWMP fundamental objectives and provide context for the creative work of Session II.

We will begin with a brief overview of progress since the 2012 NAWMP Action Plan and the current status of our collective integration efforts. We will report on a recent attempt to catalog the major recurring decisions made by waterfowl population and habitat managers and related decisions with regard to waterfowl users and supporters. We will also explore the spatial/organizational scales at which various decisions are made and, emphasize the natural key roles that habitat planners at the JV/State/Provincial scales have in bringing about the integration of multi-objective management.

This brain-storming session will highlight the kinds of decisions being made by JV/regional implementation agencies, and assumptions about impacts of habitat delivery on people (including hunters, viewers and program engagement by landowners in the e.g., agricultural sector), EG&S, and birds. We will devote most of this session to exploring concrete example(s) of how some agencies have attempted to address tradeoffs when integratingmultiple objectives. Consistent with NAWMP, natural resource management decisions at regional scales involve all three elements of populations, habitat, and supporters. The session will emphasize how habitat conservation strategies serve as means to achieve fundamental objectives related to populations and supporters.

The session will conclude with a summary and suggested template to explore the challenges and opportunities that will be the focus of Session II.

10:15 Break

10:30 Session 2 – Objectives for habitat, birds and people: relationships and tradeoffs among objectives relative to key conservation management decisions

Facilitators: Mike Brasher (GCJV), Anne Bartuszevige (PLJV), Josh Vest (IWJV).

Here we expand from session 1 discussions and conclusions, and begin by identifying a suite of key management decisions that require integration of multiple objectives. This will be accomplished through 3 break-out groups oriented around 3 hypothetical landscapes each with unique ecological and social contexts as well as unique conservation/management objectives relative to NAWMP. Each group will begin to explore how to specify hypothesized relationships between habitat investments and responses by waterfowl population and supporters. We will also consider how to describe explicitly the possible trade-offs between decisions that favor meeting prioritized objectives as well as alternative management decisions. As a point of focus and orientation for this session, recall that Habitat Objectives are a means to achieve the fundamental Waterfowl Population and People Objectives.

Session Objectives via Break Out Groups:

- Identify key conservation management decisions at regional scales that require consideration of multiple objectives
- Explore tradeoffs in achieving multiple objectives through key management decisions
- Explicitly identify tradeoffs, functional relationships, and assumptions regarding alternative management decisions and associated objectives

Management decisions to explore in break out groups should meet the following criteria:

- Relevant to addressing each of the three primary linked objectives: Waterfowl Populations, People, Habitat.
- Represents an assumed trade off in waterfowl management
- Have attributes that can be expressed in a measurable way
- Scalable across landscape or regional scales (i.e., relevant beyond a site-specific scale)

Potential suite of management decisions to consider during break out sessions:

- Habitat delivery to achieve waterfowl population objectives and supporter objectives
    - Waterfowl habitat & hunter habitat
    - Waterfowl habitat & supporter habitat
    - Waterfowl habitat & other wetland wildlife habitat
- Habitat delivery to achieve people objectives
    - Hunter habitat & other supporter habitat
    - EGS habitat investments & supporter habitat
    - EGS habitat outcomes & waterfowl population outcomes
- Public engagement to generate support/development favorable policies
    - Waterfowl, agricultural, societal, & biological values

- Hunter & other supporter recruitment

Definitions: Delivery = direct habitat conservation and/or management; EGS = ecological goods and services.

12:00 Lunch

1:30 Session 2 (continued)

5:00 Adjourn

Feb11

8:30 NSST and IIC BUSINESS MEETINGS (see related agendas)

11:40 Lunch

1:00 RESUMPTION OF INTEGRATION WORKSHOP

Session 3: Reporting out from Session 2 break out groups – (Discussion Lead: Bob Clark)

- Brief Recap of Day 1
- Three 20-30 minute presentations/discussions from each group
- Synthesis of breakout elements
  - Themes, assumptions, metrics, relationships, and uncertainties
  - Consensus and divergence of these elements
  - Factors influencing consensus or divergence

2:45 Break

3:00 Session 3 – Continued

- Advancing integration concept at regional scales
  - Taking what we have learned back to our respective spheres/jobs
    - Hurdles/challenges – approaches to address them
    - Petrie dishes currently exist or being developed?
  - NSST Mapping Committee (Howerter et al.)
    - Context and task(s)
    - Key lessons/elements from workshop to inform process
  - Opportunities for further NSST/IIC collaboration?

4:00 Circling back: next steps, actions items, leads, timelines. (B. Clark, others).

5:00 Adjourn

APPENDIX 2 – Participants to the Integration Workshop, Memphis, Feb 2015.

Front row (left to right): Bob Clark, Diane Eggeman, Todd Arnold, Barry Wilson, Anne Mini, Kathy Fleming, Mike Brasher, Dana Varner, Dave Gordon, Gray Anderson.

Second Row: , Jim Gammonley, Sean Fields, Greg Yarris, Joe Fuller, Greg Soulliere, Tim Jones, John Eadie, Erik Osnas, Anne Bartuszevige, Dave Howerter, Jorge Coppen, Dale Humburg.

Far back row, left side (left to right): Dave Duncan, Ken Richkus, Rob Holbrook, Mike Anderson, Luke Naylor, Josh Vest.

APPENDIX 3 – Characterizations of (A) high density breeding, (B) high density wintering and (C) low density wintering Joint Ventures.

A. High Density Breeding Joint Venture

The High Density Breeding Joint Venture (HDBJV) is one of the original habitat JVs established in the 1986 North American Waterfowl Management Plan (NAWMP) and is comprised of a strong and advanced partnership, management board, and technical committee. It comprises over 430,000 mi^2 across two countries (US and CAN) within grassland and parkland biomes containing a high density of primarily shallow, isolated wetland basin habitats. Significantly, some 70% of the landscape is privately owned agricultural land. It is characterized by a predominately rural, low-density human population where intensive row-crop, cereal grain and oil-seed agricultural and ranching/livestock production are the dominant socioeconomic factors. However, energy development (oil/gas and wind) is a growing component of the landscape and socioeconomics in portions of the JV.

The HDBJV is one of the most significant breeding areas for waterfowl in North America, producing over half of the continent's dabbling and diving ducks. Consequently, the JV's original focus has been the conservation of breeding waterfowl habitat. Its partnership has developed some of the most advanced, spatially-explicit decision support tools for habitat conservation and assessments of habitat threats, landscape change, waterfowl population-habitat relationships, and population demographics. The JV also provides some of the most continentally important breeding habitats for shorebirds, waterbirds, and particularly grassland-dependent landbirds. It has embraced an integrated approach to "all-bird" habitat conservation and also developed spatially explicit decision support tools for these non-waterfowl guilds. It's Management Board and partnership remains committed to strengthening its biological foundations and refining these "all-bird" conservation strategies. In short, the JV's conservation focus has long been on breeding avian biological parameters and it remains a priority. However, the JV has recently made strides in linking human dimension components into its conservation decision-making strategies primarily through assessing ecological goods and services and their relationship with regional social values (e.g., soil conservation, erosion control, sediment and chemical transport, wetland conservation, greenhouse gas sequestration and flood abatement). More broadly, there is a formal acknowledgement of the JV's role in providing waterfowl harvest and bird viewing opportunities at a continental scale.

Basic Facts about the HDBJV:

- Supports > 20 million breeding ducks and geese, mostly on private land
- Key waterfowl habitats include "large" blocks of grasslands with high density wetland habitats.
- Mostly rural geography – low density human population
- Agricultural production is the dominant socioeconomic driver.
- Waterfowl harvest is substantially lower than High Density Wintering Joint Ventures ; but is a popular hunting destination
- Active and engaged Management Board, Technical Committee, and Implementation Partnerships

- Core staff include JV Coordinator and Science Coordinator
- High degree of population and habitat assessment and inventories
- Waterfowl populations have remained “high” due to favorable climatic conditions over the past decade
- Conservation challenges include:
    - Conversion of grassland habitat to non-compatible uses, primarily intensive agriculture
    - Loss of wetland habitats to agricultural practices (ditching, tiling, draining)
    - Agricultural and energy market forces dramatically out-competing conservation incentives; also increasing cost of conservation actions (especially easements)
    - Growing negative perception of federal agencies and programs
- Conservation support within the region:
    - Strong presence of avian and other natural resource conservation NGOs
    - Strong agency support of waterfowl conservation (in most of JV)
    - Strong agency and NGO habitat conservation/management programs
    - Increased recognition of EGS provided by conserved wetlands
    - Recent trend in increased national conservation funding allocations to the HDBJV

Priorities:

- Sustaining the existing footprint of native and restored grassland habitats; alternatively, reducing the rate of grassland conversion
- Promote sustainable ranching economies consistent with avian habitat needs
- Promote the restoration, enhancement, and protection of wetland habitats, particularly seasonal habitats
- Improved communications/marketing of grassland/wetland conservation ecological goods and services to regional and national communities
- Improve the application of social sciences to increase conservation program participation by private landowners

Objectives:

- Protect four million acres of wetlands and 13 million acres of upland/grassland habitats
- Restore/enhance 1 million acres of wetland and 9.4 million acres of upland/grassland habitats
- Increase landowner participation in conservation programs through outreach and communication tools (by 30% within 10 years?)
    - Sub-objectives: 1)develop measurable social/HD objectives to inform communication strategies, 2) quantify socioeconomic factors for sustaining ranching economies
- Increase regional public (municipal) support/acceptance of conservation measures through communications and outreach regarding ecological goods and services provided by those conservation actions. Attain a 60% public approval rating for voluntary wetland and upland habitat conservation programs within 10 years.

B. High Density Wintering Joint Venture

The High Density Wintering Joint Venture (HDWJV) is one of the original JVs identified in the 1986 North American Waterfowl Management Plan (NAWMP) and continues to be considered among the most important regions for wintering waterfowl. Winter population objectives for the HDWJV suggest it may support >10 Million ducks and geese annually. This region contains an abundance and diversity of waterfowl habitat types, including winter-flooded agricultural lands, bottomland hardwoods, oxbow lakes, and coastal marsh. Because of this habitat base, the HDWJV supports a diversity of wintering waterfowl species. The HDWJV is a region with strong cultural ties to the waterfowling tradition, and is an area of high waterfowl harvest. The geography is primarily rural with a heavy agricultural land use, but several large and growing urban population centers are also present.

The HDWJV has an engaged Management Board and has been an active and pioneering participant in science and conservation in support of the NAWMP since its inception. The HDWJV Management Board is committed to helping implement the three goals of the 2012 NAWMP, but is uncertain of the best resource investments to help achieve the "waterfowl supporter" goal without distracting from a longstanding focus on addressing the biological needs of wintering waterfowl populations. The HDWJV is well-staffed, with expertise and experience in remote sensing, GIS, strategic habitat conservation planning, conservation delivery, population and habitat monitoring and assessment, avian ecology, and partnership coordination to include partner policy promotion efforts. Although originally established because of its importance to waterfowl, the HDWJV now invests equally in strategic habitat conservation for landbirds, shorebirds, and waterbirds. Basic facts about the HDWJV:

- May support >10 Million wintering ducks and geese annually
- Key waterfowl habitats include flooded agricultural lands (e.g., rice, soybeans), bottomland hardwoods, and potentially others (e.g., coastal marshes)
- Strong cultural link to waterfowl hunting tradition and an area of significant waterfowl harvest, accounting for 10-15% of total US harvest annually
- Waterfowl hunter numbers have been stable or slightly increasing over the past 5-7 years
- Percentage of the population that considers themselves "birders" is comparatively low (15-20%)
- Mostly rural geography with several large urban centers; total human population of ~6 Million
- Urban centers are expanding, in some cases encroaching on agricultural lands that historically have provided important waterfowl habitat (i.e., ricelands)
- Conservation challenges in the region include:
    - declining availability of surface- and groundwater for rice agriculture and management of wetland habitats for wildlife
    - urban expansion and conversion to land uses of lower value to waterfowl
    - coastal wetlands loss driven by sea level rise, hydrologic alteration, etc.
- Conservation support within the region includes:
    - strong presence of avian and other natural resource conservation NGOs
    - geographically variable outreach and promotion of non-consumptive birding activities
    - birding clubs active in and around urban centers

- strong agency support for waterfowl conservation efforts
- several active JV partner-driven waterfowl habitat restoration programs

While the HDWJV recognizes myriad conservation challenges and opportunities throughout their landscape, the Management Board presently places greatest priority on the following areas:

- Sustaining the existing footprint of rice agriculture within the JV by promoting policies, programs, and activities that help ensure farming operations remain profitable and continue to provide quality habitat for waterfowl. At least in one portion of the JV region, urban expansion is the primary threat to sustaining this agriculture footprint, while in another the availability of water for irrigation and winter flooding is the greatest threat
- Restoring and enhancing palustrine wetlands within the agricultural landscape of the JV, especially targeting those areas that are no longer in active rice production
- Restoring and protecting coastal marsh through a combination of small-scale projects and advocacy for permitting and funding of large-scale projects
- Growing the number of conservation supporters within the HDWJV geography, without a clear preference for whether that growth is achieved among consumptive users (i.e., waterfowl hunters) or non-consumptive users (e.g., bird watchers, nature tourists)
- Application of social science to increase the likelihood of conservation program adoption by private landowners

Specific objectives related to these priorities include:

- On average, maintain 450,000 acres of rice agriculture within the HDWJV annually
- Ensure winter flooding of at least 275,000 acres of harvested rice and other palustrine wetlands within the agricultural landscape of the JV annually
- Reduce the rate of coastal marsh loss by 20% within 25 years
- Increase the number of waterfowl hunter use-days on state WMAs by 10% within 5 years
- Increase the number of visitor use-days during the non-hunting period on public lands throughout the JV by 25% within 10 years

C. Low Density Winter Joint Venture (LDWJV)

The Low Density Winter Joint Venture is a relatively new JV. It was formed well after the original "Waterfowl" JVs in response to the NABCI creating an "all-bird" focus for the migratory bird management community, including migratory bird JVs. Thus, not being particularly rich in wetland habitat, LDWJV has not yet completed a waterfowl management plan as required by the NAWMP Committee to be endorsed by them. However, the LDWJV would like to participate fully in all the continental bird conservation plans and so, a waterfowl management plan is in the works (12-24 months to completion). One thing from the NAWMP revision did catch the LDWJV's attention, the third NAWMP objective: "growing numbers of waterfowl hunters, other conservationists and citizens who enjoy and actively support waterfowl and wetlands conservation". The JV coordinator thinks that the

recent release of the NAWMP revision presents a great opportunity to endeavor in developing a progressive, integrated waterfowl plan that incorporates human dimensions into the planning for management decision frameworks. LDWJV has several sizeable urban populations and rural areas with strong hunting traditions. It's within this objective that LDWJV thinks it can make some real progress within the NAWMP. Although, the LDWJV suspects it is more important to continental waterfowl populations than originally thought due to presence of stock ponds to water cattle and man-made reservoirs which serve as roosting sites for migrating and wintering waterfowl. In particular, these may become more important as changes in climate progress throughout the continent.

Some Basic Facts about LDWJV:

- Not an original waterfowl JV thus no real connection to NAWMP
    - Population objectives for waterfowl have not been set
    - A biological plan for waterfowl is in progress
    - Waterfowl are a low priority in the region both from a NAWMP perspective and state management perspective, so population objectives will likely reflect that
- Does not have basic wintering or migration data for waterfowl. It is not part of the "original survey area" nor do the state partners conduct surveys for waterfowl within the LDWJV area
- Numbers of hunters are available through state wildlife offices as well as numbers of waterfowl hunted by county
- Number of hunters is relatively small compared to HDWJV and HDBJV but it is stable
- There are several active birding clubs within the region
- LDWJV has portions of five states within its region
- There are several sizeable and expanding urban centers within LDWJV
- LDWJV has an active and engaged management board, which includes state, federal and several habitat NGO partners
- Wetland conservation programs are limited to those available through the Farm Bill and NAWCA
- LDWJV has recently been able to "staff-up" and now has a coordinator, science coordinator and a GIS analyst
- Basic communications are handled by the coordinator, but mostly partners are relied upon for communications capacity
- LDWJV has few naturally occurring wetlands. However, man-made wetlands, stock ponds and reservoirs are abundant
- Major land cover types include urban (~10%), row-crop agriculture (~40%), native grasslands (~15%), and shrubland and forest (35%)
- Priority habitat conservation for the JV includes:
    - Improving grassland condition through grazing management programs
    - Managing early successional woody habitats for land birds that rely on that habitat type
    - Increasing availability and people's awareness of urban open spaces for wildlife habitat and viewing opportunity
    - Understanding importance and management potential of stock ponds and other manmade wetlands to wetland dependent birds and other wildlife (e.g., providing

disturbance-free roosting areas, seeding to increase food availability, potential for accumulation of toxic heavy metals, etc.)

- Human dimension objectives related to NAWMP:
    - Become aware of what motivates landowners to engage in conservation activities on their property
    - Increase visitation at urban open spaces by 10% over five years
    - Develop outreach and communications tools directed at 1) landowners and 2) urban residents on conservation opportunities related to birds

APPENDIX 4 (Source: D Humburg) - Characteristics of decision context and NAWMP goal target groups (highlighted in orange) associated with duck harvest, habitat and "people" management.

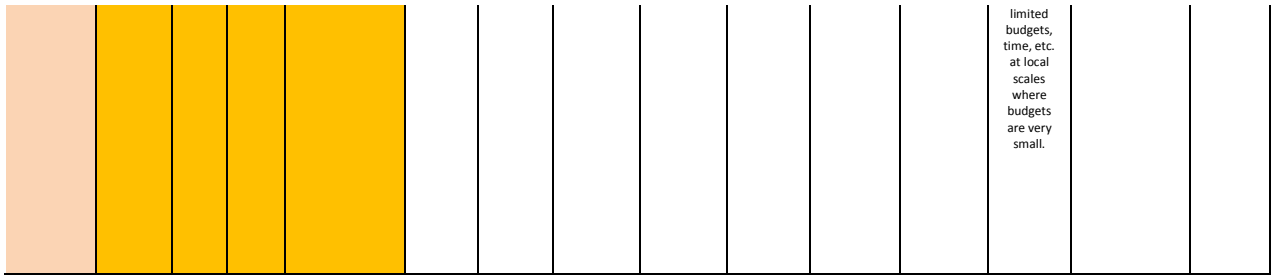
Harvest Management

Decisions	Populations	People	Habitat	Resources	Spatial Scale	Frequency	Decision Authority	Degree of Controllability (recharacterize as uncertainty)	Monitoring & Assessment Capacity	Present Integration with other Decisions	Management Actions	Tradeoffs	Relevance (Who is going to care?)	Potential for Integration
Commitment to an informed decision process (e.g., Stabilized Regulations; Mid-Continent Mallard AHM; Black Duck AHM)	**X X**	**X X**		**Flyways, Council, DMBM, CWS,HMWG,**	National or Bi-National thus far	Variable; every 15-20 years	Federal Wildlife Services, Flyway Councils	High with respect to process only	Good for population size; weaker for vital rates	NAWMP population constraint in Mallard AHM; fixed, not dynamic. Implicit assumptions about carrying capacity (e.g. JTG yield model). Nothing explicit about people.				
Annual harvest regulations	**X X**	**X X**		**Monitoring, Assessment, Regs, Meetings**	National, with some variation among Flyways, Provinces or UMAs (distinction between state and federal jurisdictions)	Annual	SRC/USFWS in U.S.; CWS waterfowl regulations committee in Canada. Oversight by SEMARNAT (?) in MX.	Only moderate with regard to harvest rates. Weak with regard to population size or annual survival	Good for population size; weaker for vital rates	For decision purposes the only habitat connection is to wetland abundance which is an uncontrolled variable; no explicit connection to user/supporter objectives but lots of implicit linkages	Bag limits, framework dates, season lengths, zones/splits, special seasons, etc.	Simple versus complex regulations, frequency with which packages change, risk related to population status versus hunter retention and satisfaction	Relevant for species which can be affected by harvest rates and near term changes in this regard. Also relevant to hunters if issues of regulations complexity or level of opportunity are important.	
Stock-specific management plans (Geese)	**X X**	**X X**		**Monitoring, Assessment, Regs, Meetings**	Stock ranges or Flyways	Variable, but typically 5+ years	USFWS/ CWS with Flyway Councils	Variable; ability to control harvest rates varies by stock and over time	Variable; usually good for population size and weaker for vital rates	Usually developed in recognition of hunter interests and, at least for geese, patterns of sanctuaries. Usually NOT linked to other explicit objectives				

Habitat management

Decisions	Populations	People	Habitat	Resources	Spatial Scale	Frequency	Decision Authority	Degree of Controllability (recharacterize as uncertainty)	Monitoring & Assessment Capacity	Present Integration with other Decisions	Management Actions	Tradeoffs	Relevance (Who is going to care?)	Potential for Integration
Advocate for large-scale land-use policies that affect conservation (e.g., agricultural policies, water use policy, coastal zone policies, etc.)	X X	X X	X X	**JVs, NGOs, Flyways**	National or State, primarily	Episodic, every several years (e.g., 5 years on average for U.S. Farm Bill)	U.S. Congress; Administration Secretaries; Federal or Provincial Ministers	Low; many competing interests at play	Generally poor; usually ad hoc; there have been some exceptions.	Farm Bill policy is largely driven by ag policy but lacks integration with willdife interests. Among wildlife interests there are few conversations allocating acres among landscapes.	Actions generally fall under three broad categories: Farm Bill, Wetland Policy, Appropriations. Selection of the basis for policy advocacy (e.g., biological needs, wildlife user needs, ag interest needs) is a key sub-decision.	Spatial priorities likely not aligned among bases for policy advocacy. Biological gain vs. loss of constituents	Ag producers, wildlife users, private landowners, developers, etc.	Collaboration among interests may result in synergies that maintain programs. Spatial priorities may be aligned
Development of large-scale (i.e., continental, national, regional) waterfowl conservation strategic plans	X X	X	X X	**JVs, NGOs, Monitoring/Evaluation, State & Fed Agencies**	Multiple - depends on the decision authority	Every 5-10 years; some cycles longer	JV Mgt Boards, NGO Board of Directors, Agency administrators, usually acting on the advice of their technical committees	Development of plan and priorities within is highly controllable. However, ability to implement plan is vulnerable to budgetary, market, and uncontrolled landscape variation.	Highly variable; very good to non-existent. Efforts to adapt in response to learning about program effectiveness and underlying habitat trends.	Variable, but formal integration is currently limited. Biological objectives usually stepped down from NAWMP objectives and other Bird Plans. For people, little yet, although linkage to user/supporter goals is under active consideration by some JVs, NGOs, and State agencies.	Establishment of organizational priorities, which includes direction on types of habitat work, spatial priorities, species priorities, thematic priorities (e.g., hunter recruitment vs. biological gains), etc. Guided in part through development of DSTs.	Tradeoffs among three goals occur at the fundamental level of resource allocation. No single strategy is best for all goals and objectives.	Most immediately relevant to organizational staff, as they are the ones that carry forward and implement the strategic plan. Ultimately, can be relevant to entire collection of stakeholder groups.	Potential for integration is high, because strategic plans provide guidance for how the entire suite of available resources can be allocated among goals.
Allocation of financial resources for large-scale habitat delivery (e.g., States provide $$ to conservation efforts on breeding grounds - AFWA State Contributions Program)	X X	X	X X	**States, Feds, NGOs**	Usually continental or national	Some annual, but usually 3-5 years	Senior managers of individual organizations, State wildlife commissioners	Controllability of the decision itself (i.e., how much to allocate) is high, but controllability of amount that is available for allocation is low to moderate because of budgetary vagaries and constraints	High in terms of ability to monitor how funds were used, but low in terms of ability to link those decisions to biological or social returns	Seems to be very little, as current strategy is to allocate resources for purpose of habitat delivery for biological gain. However, funding entities may consider other needs (e.g., hunter recruitment programs, ecotourism promotion) when deciding on allocation amount, albeit perhaps	Choices include conservation easements, acquisitions, restoration, and enhancements. Additional decisions include where to target delivery, which occurs at multiple scales (i.e., among regions, then among parcels within a region).	Allocation of resources for conservation actions to achieve biological objectives likley only rarely the best for achieving conservation supporter or EGS objectives.	Conservation organizations/agencies, conservation staff, landowners, hunters, bird watchers, ag producers, other conservation supporters	Moderate to High? Integration could occur at point where allocation decisions are made, or could alternatively be made at point where decisions are made on where and what kind of habitat to deliver

										informally. The degree of integration is greater at smaller scales - e.g., by necessity, state organizations, driven by central budget, consider tradeoffs via budget allocation				
Annual habitat program decisions (e.g., where to invest, how much to invest, what kind of projects to invest in). Usually stepped down from JVs but also other wildlife programs	X X	X X	X X	Agencies, NGOs, P-R funds, NAWCA, SWG, Land-Water Conservation Funds, Duck Stamps	Usually state or regional, but some national	Usually annual decisions about program investments within a 5-10 year JV strategic plan	Senior managers of individual organizations. For larger organizations this steps down to regional and local offices as well	Moderate; factors like markets, weather, donors and other factors can affect success of delivery	Highly variable among organizations.	Usually little on an annual basis although projects should reflect strategic integration priorities at larger planning scales.				
Staffing positions to address specific area of expertise (e.g., policy, avian ecology, social science, geospatial analysis, program delivery)	**X**	**X**	**X** **X**	**States, Feds, JVs, NGOs**	Multiple - depends on the decision authority	Episodic, as needed	Senior and mid-level managers, JV Mgt Board (or a subset of Board reps)	Controllability of staff positions and selected candidate is high, although quality of candidate pool is not controllable	Moderate to High? What is being monitored? Whether the hire was a good decision or whether the staffing position itself was a good decision? Do annual performance evaluations count?	Some integration likely occurs through consideration of tradeoffs among staffing decisions. But formal decision analysis likely does not occur.	Hiring of specific disciplines (HD, GIS, policy, etc)	Capacity in one discipline is almost always at a cost to other disciplines. Breaking out of this box and intergrating among/within positions can yield great progress. Eg, biological planning in the context of the realities of private lands mgmt is more relaistic.	Intergration almost always yields better information and results in new audiences being engaged. If true thane many new audiences should be recruited. EG, landowners understaning that a program benefits their bottomline and the wildlife resources will become an audience. We cease to be "just willdife people".	Integration is rare as positions are hired "to do policy work" but progress can be great when policy is intergrated with other diciplines. EG, a policy person armed with HD information about Farm Bill programs from private landoweres.
Individual project implementation decisions	**X** **X**	**X** **X**	**X** **X**	Field offices of NGOs, Wetland Management Districts, Refuges, etc.	Multiple - depends on the decision authority	Usually annual, sometimes semi-annual	Local office managers and field staff	Moderately high although landowners and local community pressures can affect outcomes	Usually low, although there are examples where monitoring programs have been implemented, both for biological performance and compliance.	Not high because local implementation is very directed and conducted by only a few individuals. May be tradeoffs commonly between biological and implicit user objectives or EGS objectives.	Local managment decisions (pulling borads at time x rather than y) which may be informed by personal desires as much as anything.	Recources are very limited at local levels so asking local managers to also conduct outreach, while very beneficial, maybe too much work. Planning and budgeting for such work is beneficial but must be traded against	Local habitat managers and associated teams, landowners, municipalities, county government.	Not high except where planned from higher levels of decision making.

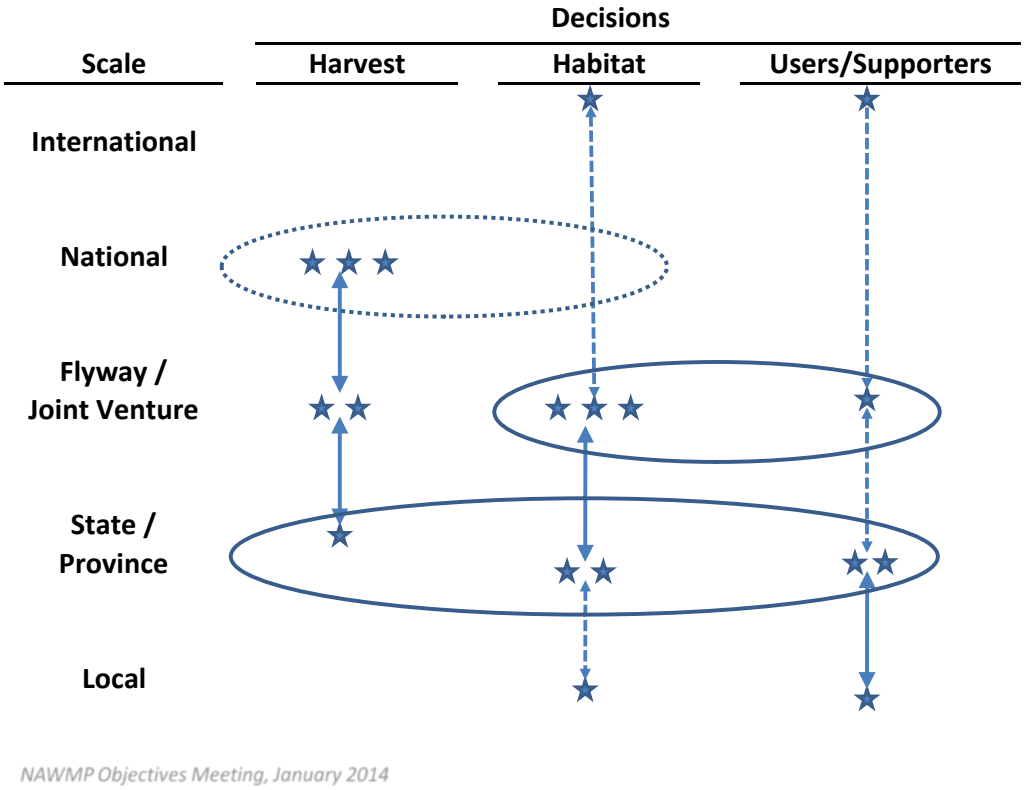

limited budgets, time, etc. at local scales where budgets are very small.

People (hunters, viewers, conservation supporters)

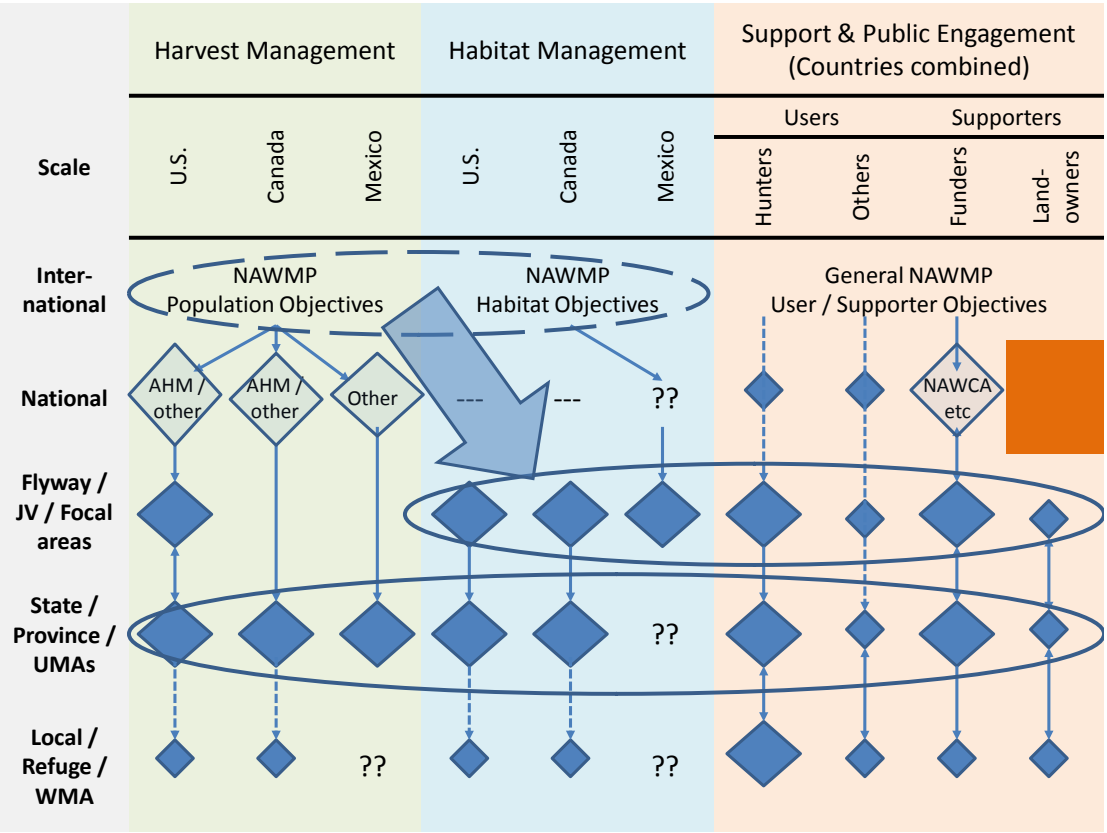
Decisions	Populations	People	Habitat	Resources	Spatial Scale	Frequency	Decision Authority	Degree of Controllability (recharacterize as uncertainty)	Monitoring & Assessment Capacity	Present Integration with other Decisions	Management Actions	Tradeoffs	Relevance (Who is going to care?)	Potential for Integration
Experimentation with hunting regulations with a focus on hunter recruitment and satisfaction (e.g., point system, Central Flyway Hunter Choice) Covered above	X				Usually Flyway or State or Province; occasionally larger scale	Usually multi-year (changes in emergency situations)	Flyway Councils with FWS and/or CWS support; individual states or provinces	Good; although results can be affected by numerous uncontrolled sources of variation.	Variable; rarely good both in terms of hunter satisfaction and waterfowl population effects. (Population monitoring is much greater than satisfaction information directly linked to regulation changes. Information lacking in terms of how regulation changes influence to hunter recruitment/retention).	Usually designed to achieve both harvest and hunter-satisfaction goals though variably explicit; typically not linked to habitat objectives.	Bag limits, season dates, zones (splits) etc.	Complexity vs simplicity of regulation; popln protection vs potential hunter recruitment and existing hunter satisfaction	Relevancy is a question...Answered to some degree by choice survey, but is this possible? Can we change regs enough to change recruitment rates. The complexity of regulations may be a barrier to entry. on recruitment and retention.	
Investing in hunter recruitment/retention	X	X X	X	**State, NGO, P-R funds, Feds, Industry**	States (in US) and Provincial hunter organizations (in Canada) are the front-line players. Not about licenses and enforcement - its about programs to support hunters	Multi-year	States and Provincial hunter groups mainly	Low; many other factors compete for people's time and can affect decisions about hunter or viewer participation (currently "low" but it should be moderate if more effective progrmas were in place).	Knowledge base has been weak but is growing recently, especially through attitudinal and choice surveys. Evaluation of experimental programs is??? Should note R3 work of CAHSS	Access initiatives managed by states and to a lesser degree managers of Federal Wildlife Refuges, Crown lands, etc. are based on at least implicit user/supporter goals. Linkage to revenue for many agencies. Very limited integration at this point and very little research based information about hunter desires/access issues.	Agencies involved in R3 programs need to adopt performance management approaches (i.e., identify desired outcomes and measure progress toward those outcomes and make decisions based on those).	Willingess to step away from way business has always been done (comfortable programs) in order to more effectively address R3.	State agencies trying to hold on to funding source. It is a business model.	
Invest in conservationist recruitment/retention (people who care about conservation but don't necessarily engage in hunting or viewing)	X X	X X	X X	**State, NGO, Feds, Industry**	Various scales (more effective below State/Prov level) and mainly supported by NGOs ability to impact/deliver in some spatial scale. Depends on the problem definition. Also will be at the local community level, especially for ESGS.	Monthly to annual, depending on NGO campaign focus / effort	Variable, depending on desired outcome.	Low - mostly try to influence volunteers	Limited - 5 yr frequency of national surveys, irregular surveys at more local scales	Very little coordination between NGOs or between NGOs and government agencies. Waterfowl community really needs to get at what we are trying to do in this one in order to effectively identify tangible management actions to be taken by others.	?? Volunteerism - so how do you manage ?? This is a gap...	Many benefits to recruiting and retaining conservationists. For state agencies, there may be tradeoffs where they have to initially invest in conservationists rather than focusing solely on hunters (i.e., "startup costs"). Overtime, the benefits may outweigh	Highly relevant to secure political support for habitat / population management. Investing in people not currently in the business model. This is targeted to those already engaged in conservation. Need to both keep them in the fold and bring them into the business model.	

Invest in general viewers recruitment/retention	X	X X	X	**State, NGO, Feds, Industry**	Local, regional, to lesser extent national (ie Audubon)	Monthly to annual, depending on NGO campaign focus / effort	Variable, depending on desired outcome.	Low - mostly try to influence volunteers	Limited - low frequency of participant surveys; NGOs may monitor membership more often	Very little coordination between NGOs or between NGOs and government agencies	?? Could institute some system of paying to participate ?? Building infrastructure that would allow/consider?	Potential conflict with hunters - scheduling access to same areas	Highly relevant to secure political support for habitat / population management. Investing in people not currently in the business model. This is targeted to those already engaged in conservation. Need to both keep them in the fold and bring them into the business model. Moderate - birders tend to be more passive and not actively or agreesively support conservation	
Decisions addressing access to facilitate participation in hunting and viewing.	X	X X	X	**States, NGO's, Refuges, EC, P-R funds**	Mostly local wildlife management areas, refuges, parks, etc, but also private lands	Seasonally or annually, sometimes more frequently	Local authorities within agency guidelines; private land owners	Depending on perspective, high for government agencies; Low for private land owners, or vice versa.	Should be high for public areas; low for private land.	Local linkage to habitat management decisions and harvest opportunity; limited connection to other scales. What type of access is desired by users of public lands? (e.g., blinds, trails, groomed, wild, etc.). Also applies to private lands with public access that is monitored.	Influence on both public and private land access	Potential conflict between private uses and hunter/viewer access; potential conflict when hunter funds used for purchasing public lands then access is restricted	Highly relevant to secure political support for habitat / population management	
Conservation policy decisions (i.e., habitat securement, population management, revenue/funding)	X X	X X	X X	Member-based NGOs, federal/state Duck Stamp Programs, many state agencies	Federal, state, local	Usually annual decision cycles	Governmental agency; sometimes oversight by Boards or Commissions	Low-moderate; affected by many extraneous political factors	Highly variable	Highly integrated process involving biological science, economics, social support, and political elements that need to be integrated. Variable over time.	Influence policy by providing information and/or implementation of policy decision.	Inherent in the policy world. Tradeoffs are negotiated issue by issue.	Highly relevant to success of waterfowl and habitat conservation. Need funding, policy, programs in order to achieve objectives.	

APPENDIX 5 - Conceptual relationships among harvest, habitat and user/supporter decisions at a range of spatial scales. Stars depict the spatial scales at which most of the major decisions presently are made. Arrows indicate strong existing vertical linkages within management streams. Dotted lines imply weaker present connections. Solid ellipses represent cross-decision-class linkages where some integrated decision-making exists and further integrated decision-making seems important and possible. Dotted ellipses represent other linkages that might be developed. (Source: MG Anderson)



APPENDIX 6 - Hypothetical current state of integration within and among waterfowl management objectives for harvest, habitat and users/supporters. Harvest and Habitat categories reflect current differences in processes in each of the three countries. User/supporter programs may differ among countries too, but not in ways as ingrained institutionally as for habitat and harvest. Solid diamonds depict loci of important management decisions; larger diamonds reflect decisions of greater magnitude. The solid ellipses indicate spatial/political scales where the potential for integrated decisions seems greatest. At the State/Provincial levels much of this is already occurring, albeit informally. At the JV/Regional scales there is strong potential to make more integrated decisions. We remain convinced of the importance of coherence between harvest objectives and habitat carrying capacity at continental scale, but are unsure of the best way to achieve this, represented by the dotted ellipse. The large diagonal blue arrow recognizes that historically continental breeding population objectives were stepped-down to regional objectives and converted to regional habitat objectives in various ways by the Joint Ventures. (Source: MG Anderson. Evolving perspectives on coherence in waterfowl management – a discussion paper for the IIC. April 2015)



APPENDIX 7. **Missouri Wetland Management Plan: Integration at a state scale**

Shortly after the North American Waterfowl Management Plan (NAWMP) was signed in 1986, the Missouri Department of Conservation initiated development of a state-level wetland management plan. The 1989 Missouri Department of Conservation Wetland Management Plan (MWMP) plan was intended to step-down the NAWMP waterfowl population and habitat goals; however was purposefully broader, integrating objectives for other wetland wildlife and fish; habitat acquisition, restoration, and management; and hunting and other public use summarized as follows:

> *"The MWMP integrates existing Department management plans for wetland areas and species into an overall framework for policy and guidance of wetland resource conservation in Missouri. In a hierarchal sense, 1) habitat objectives are presented, 2) population objectives are established within the limits of habitat quality and distribution, 3) recreational use is promoted within the framework of resource needs, and 4) research and survey needs are identified."*

Efforts at this state scale demonstrated the capacity to successfully integrate objectives for waterfowl populations, habitat, and users. Importantly, wetland management planning and implementation in Missouri also demonstrated that management for waterfowl populations and habitat is not exclusive of broader objectives for human use and a broader range of wetland wildlife. Assumptions in the 1989 MWMP included:

- The plan serves as an implementation strategy for the NAWMP in Missouri
- Wetland management in Missouri affects utilization of migratory resources flyway wide.
- "There will always be tradeoffs between resource values and utilization, but when conflicts exist, wetland management programs should favor resource values."
- Managed public wetlands will determine the abundance and distribution of wetland wildlife in Missouri
- Restoration and management strategies are different across Missouri's riparian systems
- Recreational use is a desirable by-product of wetland management
- Waterfowl declines are due to reduced carrying capacity on private lands: recovery will depend on public land restoration.

Goals and Objectives -Stepped-down and expanded: Similar to the NAWMP, objectives for the MWMP were benchmarked in part on 1970s levels of populations and public use and wetland habitat needed to maintain or increase them.

Population Goal: To achieve and maintain a diversity of wetland fish and wildlife populations in each drainage

Objectives:

- Manage habitat for >150 wetland birds
  - 14 resident species
  - 22 species - breeding only
  - 47 species – migration only
  - 71 species – multiple seasons

- 1970s levels of migrant and wintering waterfowl populations
  - Reverse the decline (1970s to 1980s) of 55% in waterfowl use
  - Increase of 15 million duck use days (DUDs) on managed wetland areas; an increase from 12.8 (1980s) to 27.8 million DUD (average of 1970s) on public wetland areas

<u>Wetland Habitat</u> Goal: To protect and improve a diversity of habitats for wetland wildlife in each major river drainage: Focus on wetland complexes throughout the year.

Objectives:

- Acquire and restore 4 new wetland areas (24,400 acres)
- Expand 6 existing wetland areas (12,000 acres)
- Restore existing wetland areas (27,000 acres)
- Management assistance on private wetlands (38,700 acres)
- Restore additional private wetlands (12,400 acres)
- Support NAWMP initiatives in the PPR

Objectives for wetland habitat were developed with acknowledgment of tradeoffs related to proximity to other managed wetland (i.e., wetland complexes), distance from users, and restoration and operations/maintenance costs. Wetland management tradeoffs also were acknowledged with regard to management intensity and integration of objectives for a broad range of wetland species.

		Priority for Managed Wetland Acquisition		
Criteria		Low	Medium	High
	Size	<1000 ac	1000-4000 ac	> 4000 ac
	Distance from other managed areas	> 11-50 miles from an existing managed wetland and >10 miles from major water area	11-50 miles from an a managed area but w/in 10 miles of other major water	≤10 or ≥ 50 miles from an existing area
	Distance from population center	>100 miles from a population center of <25,000 people	50-100 miles from a population center of 25,000-50,000 people	≤ 50 miles from a population center of >50,000 people
	Restoration cost	>$1200 / acre	$500-$1200 /acre	<$500 / acre
	O&M cost	>$35 /acre	$25-$35/acre	<$25/acre

<u>Utilization</u> of Wetland Resources Goal: To provide for public utilization of wetland-related resources that is compatible with habitat and population objectives.

Assumptions:

- Most recreational use of wetlands occurs within 50 miles of residence.
- "Regional recreation objectives are determined in part by the size and distribution of population centers (5,000 people or larger) and their proximity to wetland areas."
- Waterfowl hunters travel farther than other wetland related recreationalists (~30% more)
- On managed Department areas:
- "The primary objectives of hunting controls on public areas are to allocate resources among hunters, promote safety, and ensure that public use does not preclude use of areas by wetland wildlife."
- "Control of hunter distribution and numbers will likely be necessary to ensure that both resource and recreational benefits are attained."

Objectives: Waterfowl hunting and harvest

Statewide:

- Achieving habitat objectives will enable 50,000 hunters to harvest 230,000 ducks and 75,000 geese each year (~1970s levels)

Public Areas:

- 42,625 duck hunter trips (@ ~1 party/40 acres) and ~ 1 bird/hunter

Refuge: Establish waterfowl refuges on 25-50% of each public area of 500 acres or more in size (one or more of the following apply):

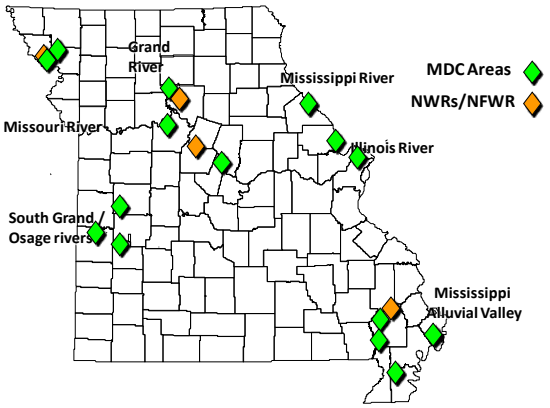
- Where at least 500 acres have been developed and managed for wetland wildlife

- When the area is >10 miles from other undisturbed water area (based on Reineke winter mallard research)
- Where hunting pressure on surrounding private lands exceeds 1 hunter / 10 acres
- Public viewing is a primary objective
- Maintained or improved hunting success is a primary objective

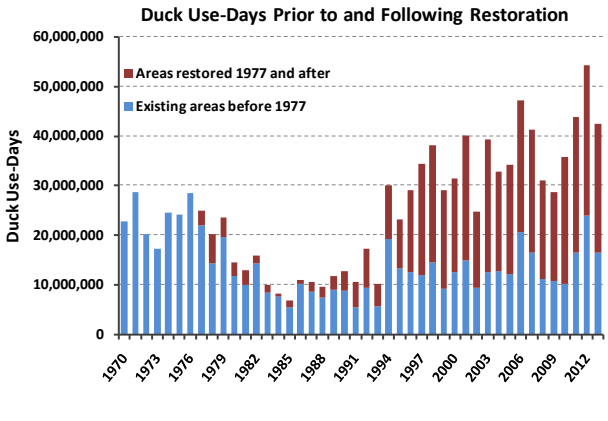
Policy-level commitment: Leadership from Department administration and the Conservation Commission was evident over the decade following development of the MWMP in the funding of wetland acquisition, restoration, and management.

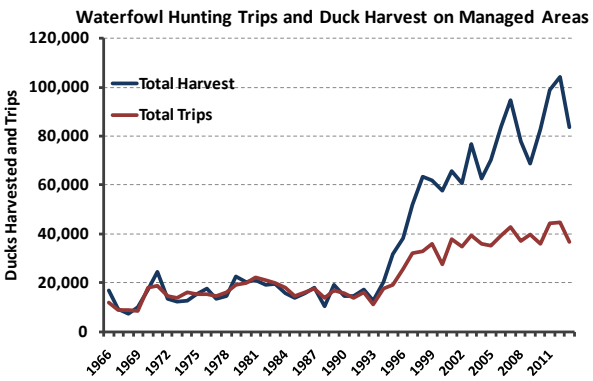
Projected cost = $59.1 million first 10 years

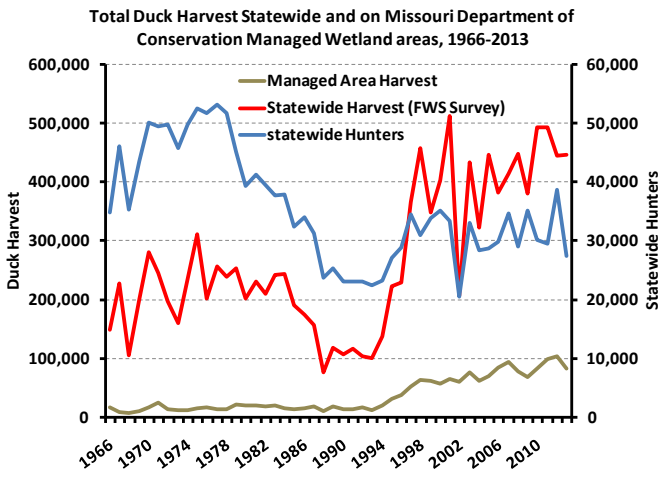
- Breeding Grounds
  - $1.1: NAWMP – PPR
- Acquisition
  - $10.4: New wetland areas
  - $11.4: Expansions to existing areas
- Restoration / development
  - $14.0: Restoration of existing areas
  - $4.5: Restoration of expansions to areas
  - $10.1: Restoration of new areas
  - $2.25: Restoration of small wetlands
- Operation and Maintenance
  - $0.7/year : O&M on 40,000 acres



Management Outcomes: Over the 25+ years following implementation of the MWMP, habitat objectives were met via addition of managed wetlands on Department areas and exceeded due largely to the unanticipated implementation of the Wetland Reserve Program which added about 150,000 acres on private lands. Duck use objectives increased to objective levels (and exceeded them in some years) as newly acquired wetlands were developed. Objectives for waterfowl hunting trips and harvest on Department areas were achieved, and statewide harvest exceeded expectations.







Missouri Wetland Management Planning – the next iteration: Much of the strength of the MWMP during implementation and beyond has been in the on-going engagement of Department leadership, managers, and researchers. A process termed "Wetland Review," initiated in the mid-1990s, provided a forum for constant evaluation and integration of experience and emerging knowledge into wetland management. Diverse participation, well beyond wildlife managers, has included university researchers, hydrologists, soil scientists, foresters, and fisheries managers. This has created a culture of broad stakeholder engagement and structured decision making and was the basis for recent revision of the Missouri wetland plan wherein key questions – difficult and challenging questions – were posed and addressed:

- How can we better incorporate management and scientific knowledge into planning and decision making?
- How can we engage all the disciplines necessary to understand system processes?
- How can we engage stakeholder to help set objectives and identify management alternatives?
- How should Missouri implement the NAWMP within the context of other system, population, habitat, and public use planning efforts?

Experience in Missouri has demonstrated that integration of wetland management objectives and expanded engagement across the spectrum of natural resource management are achievable. As tenets of structured decision making would suggest, broad stakeholder engagement, rigorous assessment of assumptions and objectives, planned monitoring and evaluation, and an organizational culture that invites this dialogue all are essential features.

APPENDIX 8 - **Breakout Group Summary for Waterfowl Management Integration within a Hypothetical High Density Breeding Waterfowl Joint Venture**

Group Members: Bob Clark, Dave Duncan, Diane Eggeman, Sean Fields, Kathy Fleming, Joe Fuller, Dave Howerter , Mark Petrie, Ken Richkus, Josh Vest (Facilitator)

Characteristic of High Density Breeding JV

- Geography is primarily rural, agricultural production is the dominant socioeconomic factor, and most of the geography is in private ownership.
- More than half of the continents breeding waterfowl population occurs here
- Human dimension (or social) objectives for the JV were discussed and consensus reached for:
  - Increase regional public support for conservation
  - Increase private landowner participation in conservation

Integration– The group explored their perceptions of integration and reached consensus on the following working definition to guide the remaining process:

- Each decision takes into account, through evaluation and explicit recognition, its impact on all 3 fundamental objectives.
- Additional refinements through discussions included:
  - Evaluation could be quantitative but not necessarily
  - Some decisions affect outcomes/objectives at different scales
  - Should include stakeholders affected by management decisions

Exploring Relevant Habitat & Supporter Objectives to Integrate–

- The group initially explored tradeoffs and relationships between potential hunter objectives and waterfowl habitat objectives. After some exploration several points emerged.
  - A high weighting or focus on hunter objectives could result in an emphasis on staging habitat in the JV versus breeding habitat which may conflict (i.e., large tradeoff) with core biological objectives.
  - The group largely agreed that hunters may not be the focus for the JV, but integration of human dimension objectives should be focused more on community and agricultural stakeholders.
  - However, the group did acknowledge that providing habitat for waterfowl (i.e., habitat/waterfowl population objectives) provides hunter opportunity at scales that transcend JV.
- The group also explored the complexities of “Habitat” as both a Fundamental & Means Objective(s) for NAWMP.
- The group then focused on clearly identifying who the supporters/stakeholders were for the JV including (but not limited to):
  - Agricultural producers
  - Local Governments & Councils

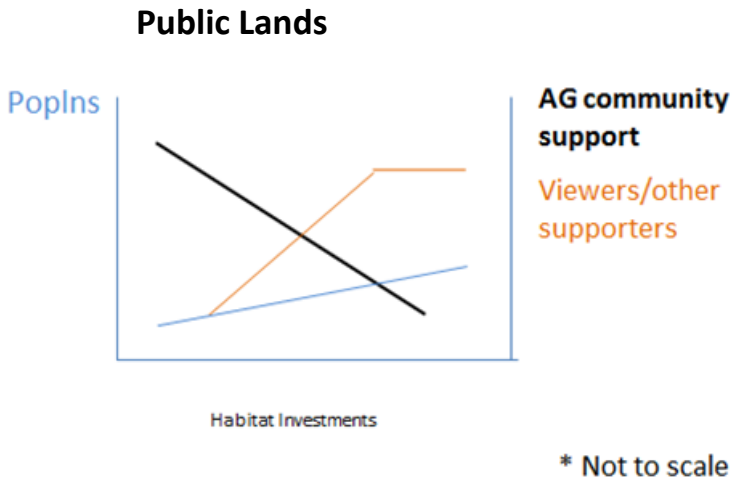
    - Corporate Agricultural
    - Natural Resource Management/Conservation Agencies and NGOs
- The group discussed the importance of how identifying the landscape stressors to waterfowl habitats and identifying key stakeholders allowed us to characterize and prioritize an overarching Conservation Approach.
    - The habitat goal for this approach is to maintain landscape carrying capacity and productivity
    - Currently, the conservation approach can be characterized by 3 primary habitat conservation categories:
        - Public land acquisition (and management)
        - Retiring private lands
        - Working landscapes

Exploring Tradeoffs– The group then attempted to explore potential tradeoffs among objectives, explicitly identifying working assumptions regarding current conservation approaches (public lands, retiring private lands, working landscapes). They began with a public lands approach:

- Assumed benefits from emphasizing public land acquisition and management included:
    - Complete management control
    - Long-term/permanently securing conservation investment
    - Perception of broad conservation benefits
- Potential tradeoffs of a public lands focused strategy included
    - Removing land from agricultural production and local tax base
    - Perception of federal overreach
    - Alienation of potential local supporters (landowners)
    - Typically high cost ($$) of acquisition and long-term management (infrastructure, personnel).
    - Although not necessarily a negative connotation, one potential outcome could be a bolstering of support from the "general public" outside of the JV. e.g., support from environmentally concerned stakeholders nationally may be bolstered but could be in direct conflict with local stakeholders. This creates communication challenges across political scales for conservation messaging.
- The group also spent time conceptualizing the functional relationships between objectives within the context of a public lands conservation approach:
    - Ag community support is likely to decrease with increasing public land acquisitions (black line in figure below)
    - Waterfowl population response is likely to be positive (blue line in figure below) but overall small due to high cost of acquisitions and amount of funding required to significantly effect a population scale response
    - Wildlife viewers/environmental stakeholder support (orange line in figure below), at regional or national scale, likely to increase to some unidentified threshold. High

uncertainty regarding the degree to what this "support" translates to conservation capitol or opportunity

- These relationships are reflected graphically below:



- The group also explores assumptions and tradeoffs regarding a Working Lands approach
  - Assumed benefits of a working lands approach included:
    - Help sustain farm and community viability (keep land in ag and taxable landbase)
    - Nonmonetary benefits such as sustaining cultural values
    - Cost effectiveness may be higher over the long-term compared to retiring working lands, or public acquisition
    - Potentially large scale of impact that is likely to be important for achieving biological objectives
  - Potential tradeoffs with a private lands approach included
    - Less control (long-term)
    - Relatively lower duration of benefits (incentives subject to policy changes)
- Unfortunately, the allotted time expired before the group could more fully explore these tradeoffs or explore an approach emphasizing retiring private lands.

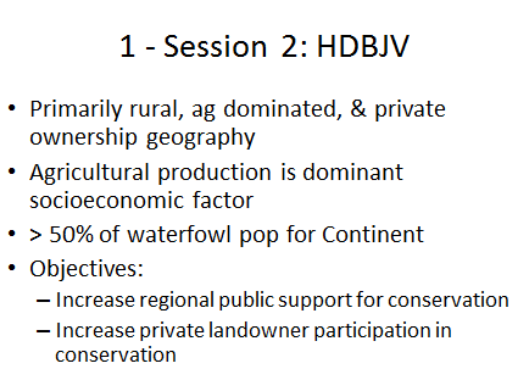
Lessons Learned for the HDBJV exercise and group:

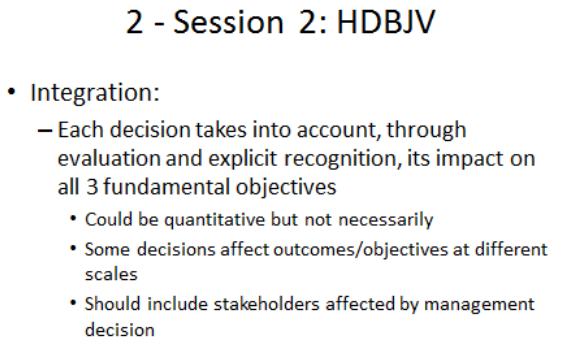
- Different perceptions of benefits/trade-offs in system regarding objectives and stakeholders. These relationships are often complicated and nuanced and the group struggled with these components.
- Due to these complexities, the group did not clearly define the objectives that most warranted integration.
- From discussions, it emerged that at a regional scale, we do not necessarily have to address all of the fundamental objectives. The important aspect is that we make progress on identifying and integrating those objectives most relevant to the region (e.g., JV). Explicitly recognizing and

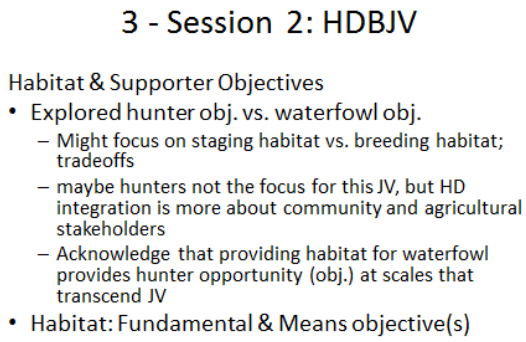
conceptualizing relationships between 2 objectives is an important step toward integrated decision-making.

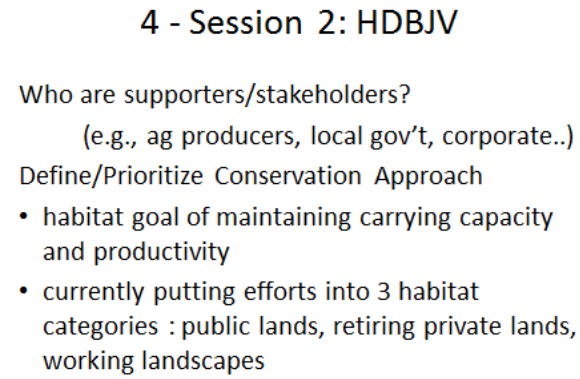
- The group recognized that how individual JVs may ultimately decide to weight the 3 fundamental objectives will vary considerably across geographies.
    - E.g., for the HDBJV hunters likely not the key stakeholder group, but actions here affect hunters elsewhere and therefore have implications to other JV hunter objectives, at least implicitly.
- There is a high degree of uncertainty regarding assumptions and trade-offs associated with 'People' objectives (e.g., values). More reliable information about these issues is needed.
- JVs may need to acquire or develop appropriate skill sets to address complex Human Dimension/Social objectives. This will invariably create challenges in resource allocations to meet this need.
- Finally, an operational theme or philosophical tenet regarding integration of habitat and people objectives should be recognizing that conservation is something we should do **for** people, not **to** people.

Note. The following slide images developed during this session are retained below and, in general, can be linked to context provided in the narrative above:







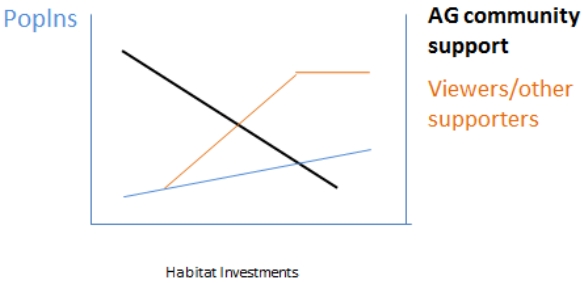


5 - Session 2: HDBJV

Define/Prioritize Conservation Approach
Explore categories:
Public lands

- Assumed benefits
  - Complete management control
  - longterm/permanent
  - Perception of broad conservation benefits
- Tradeoffs
  - Removing land from ag/taxbase
  - Perception of federal overreach
  - Alienate local potential supporters (landowners)
  - $$ (cost/benefit?)
  - Stronger support from "public" outside of JV?

6 - Public Lands*



* Not to scale

7 - Session 2: HDBJV

Define/Prioritize Conservation Approach
Explore categories:
Working Lands

- Assumed Benefits
  - Helps sustain farm and community viability
    - Keep land in ag and taxable landbase
  - Scale appropriate for biological obj.
  - Cost effectiveness
  - Nonmonetary benefits, sustain cultural values
- Tradeoffs
  - Less control
  - Relatively lower duration of benefits (incentives subject to policy)

8 - Session 2: Lessons Learned

- Different perceptions of benefits/trade-offs in system (objectives, stakeholders)
  - Struggled with this… it's complicated
- Getting clear bead on objectives was not completed.
- At a regional scale – don't have to address all of the fundamental objectives
  - How will JVs decide how to weight the 3 fundamental objectives (will vary a lot – with geography?)
  - In this JV, hunters not the key group (but actions here affect hunters elsewhere)

9 - Session 2: Lessons Learned

- High degree of uncertainty about assumptions and trade-offs, e.g., values
  - We need reliable information about these issues.
- Appropriate skill set
  - Consider changes in resource allocations to meet this need?
- Conservation is something we should do **for** people not **to** people

APPENDIX 9 – **Breakout Group Summary for Waterfowl Management Integration within a Hypothetical High Density Wintering Waterfowl Joint Venture**

Group members: Mike Brasher (Facilitator), John Eadie, Tim Jones, Anne Mini, Eric Osnas, Greg Soulliere, Blair Stringham, Gregory Yarris, Dana Varner

Characteristics of the High Density Wintering Joint Venture (JV) – the geography is among the most important for wintering waterfowl, with an abundance and diversity of waterfowl habitat types, including winter-flooded agricultural lands (rice), bottomland hardwoods, oxbow lakes, managed palustrine wetlands (moist soil impoundments) and coastal marsh (also refer to Appendix 3B). The region has a strong hunting tradition and relatively high waterfowl harvest (10-15% of US duck harvest). The landscape is primarily rural, with substantial areas of agricultural land use but also with several large and growing urban population centers. The JV Management Board is committed to implementing the three goals of the 2012 NAWMP but is uncertain of the best resource investments to help achieve the "waterfowl supporter" goal without distracting from a longstanding focus on biological needs of wintering waterfowl. The JV is well-staffed, with expertise in GIS, strategic planning, conservation delivery, population and habitat monitoring and assessment, and partnership coordination to include partner policy promotion efforts. Although established because of its importance to waterfowl, the JV now invests equally in habitat conservation for landbirds, shorebirds, and waterbirds.

Integration

As we attempted to set the stage for integration decision-making, our first step was to define integration and compare ideas. We spent a few minutes individually defining the term "integration" as it relates to the three fundamental goals of the NAWMP. Although definitions had a common theme there were nuances among them. Examples of collective (combined wording) definitions are:

1. Breakdown of traditional waterfowl management program focus and resources (i.e., silos) to a broader team approach for decision making that is mutually informative and supportive in achieving multiple (≥2 of 3) NAWMP fundamental objectives while also supporting other large-scale conservation or environmental initiatives.
2. Making conservation decisions within your program focus with explicit consideration of their contributions to each of the 3 NAWMP fundamental objectives, and understanding the consequences of those decisions on other programs through a team (multi program) approach.

We also referenced the 2012 NAWMP Action Plan and found the following wording: "*An enterprise as vast as the conservation and management of North America's landscapes and waterfowl populations for specific societal benefits involves numerous decision problems at multiple temporal, geographic, and jurisdictional scales. Moreover, as was apparent in discussions of the individual recommendations, there are strong interactions among objectives and management programs that must be considered. An integrated system of management strives to formulate coherent objectives, meaning that they are harmonious, mutually reinforcing, and striving for the same endpoints – in this case, the goals of NAWMP."*

We discussed personal experiences with JVs regarding integrating objectives, especially incorporating social factors, in decision making. Every Joint Venture has challenges to integration for a number of reasons. Some of the constraints and barriers include a lack of information, tradeoffs in investments, and buy-in from partners and stakeholders. The degree of integration by JV region was variable but suggested limited progress relative to the HD-focus recommended in the 2012 NAWMP. We thought that perhaps the NSST, in addition to IIC and HDWG, may be able to provide guidance to JVs for identifying and quantifying a system to integrate social values.

Candidate Decision Exercise

The group developed example decisions likely to be encountered while managing aspects of the hypothetical JV in an integrated way. Three decisions were developed and the third was selected as a focus. This third problem statement went through various iterations as we struggled to refine a decision that was realistic enough for us to tackle in the given amount of time.

1. Allocation of human capital to address primary JV conservation needs.
2. Spatial allocation of land conservation in the form of easements / acquisition or management.
3. Determine the allocation of acre-based habitat objectives between rice and palustrine wetlands in consideration of meeting bird population energy needs (recent years) and increasing the number of hunter days within our planning geography.

Decision Criteria, Objectives, and Discussion

Decision authority: JV Management Board
Decision frequency: 5 to 10 years, typical of JV Implementation Plan revisions
Spatial scale: JV regional geography
Stakeholders: Duck hunters, rice farmers, and bird watchers (many others in real life situation).

Based on our criteria, we selected objectives that initially seemed appropriate for our JV and our problem statement. We selected two of the five objectives that were provided in exercise leaflet.

1) Ensure winter flooding of at least 275,000 acres of harvested rice and other palustrine wetlands within the agricultural landscape of the JV annually.
2) Increase the number of waterfowl hunters and hunter use-days by 10% in the agricultural landscape of the JV region within 5 years.

Our question then became if these objectives were appropriate, given our problem statement. We first examined why 275,000 acres of harvested rice and palustrine wetland habitat was an appropriate objective. We rationalized that this objective incorporated elements of our fundamental NAWMP goal of populations. The acreage likely stemmed from stepped-down waterfowl population objectives to provide food resources for ducks. Thus, this objective would consider the historical and spatial distribution of waterfowl. Additionally, this objective hit on other important elements of our fundamental NAWMP goal of people. Rice blinds are inexpensive compared to private ownership and management of wetland habitats, so this objective could provide greater hunter opportunity. Hunting

revenue would provide economic incentive to flood fields and this objective would help forge partnerships with rice growers.

Overall, this objective of 275,000 acres of harvested rice and other palustrine wetlands seemed to be getting at balancing the need for waterfowl food production with desired harvest opportunity, while encouraging post-rice harvest flooding to engage growers in waterfowl management. By the end of our discussion, we realized that our initial objective of 275,000 acres was a means objective based on bioenergetic need, but that we should parse out how it addresses the other fundamental objectives. Because we assumed rice and managed palustrine wetlands differed in their duck energy-day values, we realized that our habitat objective should be expressed in terms of duck energy-days rather than just acres. This would allow differentiation in allocation decisions between rice and palustrine wetlands with regard to the number of acres, and hence costs, that would be required to achieve our duck energy-day objectives while simultaneously assessing potential benefits to hunter use-days.

Key Assumptions and Tradeoffs

We identified several key assumptions and tradeoffs that were implicit in the objectives that we identified. Examples include:

- Waterfowl are limited by access to food (availability, quality, flooding schedule, etc.)
- Water is limited and there will be tradeoffs to where water is distributed
- Values of the decision maker(s) will reflect values and desires of stakeholders
- Increased user days causes more disturbance, reducing habitat values for foraging waterfowl
- WMAs and private hunting grounds differ in the degree to which they help achieve our multiple objectives (i.e., there are trade-offs when allocating objectives between these habitats [e.g., public access vs. private access and different DED values between habitats])

Stakeholder Objectives/Needs

We identified several considerations or objectives that were ways we could potentially achieve our fundamental goals. These were identified as means objectives in a Structured Decision Making context.

- Meet energetic needs based on stepped-down population objectives
- Maximize harvest opportunity in terms of hunter-use days
- Maximize viewer opportunity
- Minimize cost to management (although cost is identified as fundamental objective by many)
- Maximize resiliency (i.e., reduce reliance on any one cover type)
- Retain current bird distributions
- Maximize long-term rice farmer profit
- Maximize political support (NAWCA, Duck Stamp; maybe measured via “lead and lag indicators”)

Influence Diagram of System

With a focus on the two primary objectives, but including stakeholder objectives and system tradeoffs, we developed an Influence Diagram to visually describe an integrated system to serve as a tool to aid in decision making (Figure A9-1). This diagram represented one hypothesis of how we thought the

integrated system might work. The diagram demonstrated the tradeoffs or relationships at different junctures (represented with +/-), the potential effects of each decision on another aspect of the process, and ultimately the potential links among the two objectives. The relationships could either be positive or negative and may change with time.

Relationship between program implementation and anticipated population and societal responses

We began to graph some of the relationships or tradeoffs that might be expected between increasing the acres of harvested rice and palustrine wetland (Figure A9-2).

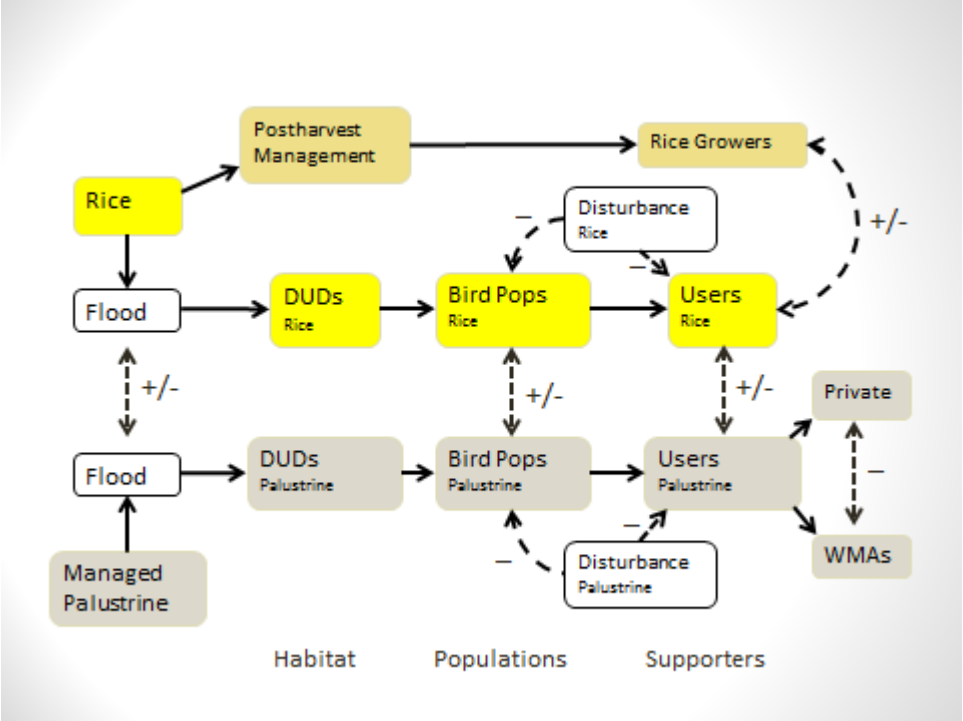


Figure A9-1. Influence diagram depicting relationship among fundamental objectives (habitat, populations, and supporters) and two primary objectives of (1) ensure winter flooding of a combination of rice and palustrine wetlands sufficient to meet duck energy-day objectives and (2) increase hunter use days by 10%. The winter flooding objective is depicted on the left and hunter use days are depicted on the right in terms of hunter access on private land and WMAs. The diagram demonstrated tradeoffs or relationships at different junctures (+/-), the potential effects of each decision, and the links among the two objectives in the context of NAWMP fundamental goals of habitat, populations and supporters.

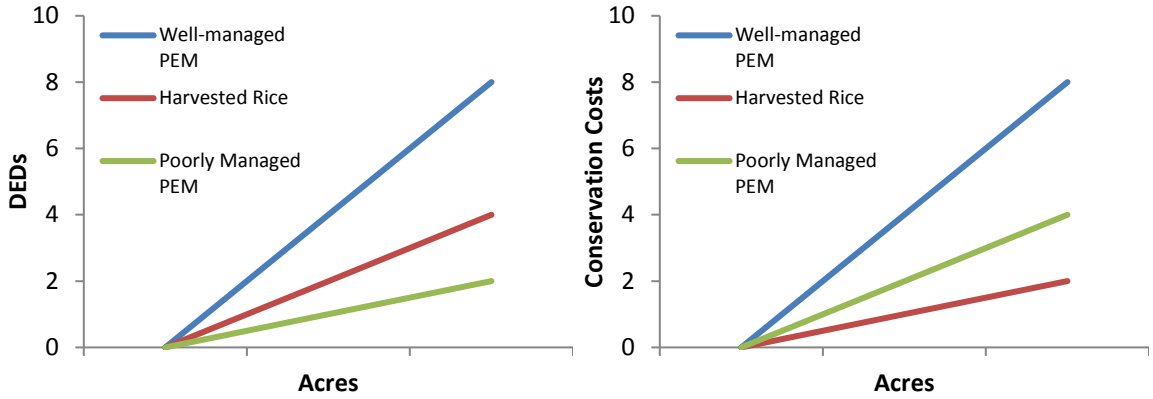


Figure A9-2. Example of presumed relationships between increasing acres of various habitat types and response in terms of Duck Energy Day provision and conservation costs.

Exercise Discussion

We found that lack of a clearly defined problem hindered development of a decision tool. The biggest problem may have been defining the problem. Although we have NAWMP fundamental objectives, we cannot develop means objectives without more detail regarding regional circumstances and problem(s) in need of strategic solutions. For example, are there minimum acreage needs for one or both habitat types? How do we minimize cost? Will the habitat base and distribution suit our needs for hunters and viewers? The habitat question always comes down to "what, where, when, how, and how much" – questions we could only partly address with the information provided.

There were primary messages coming out of the exercise:

- We must realize from the beginning the inherent interconnectedness of decisions regarding habitat conservation.
- There is integration, or at least opportunity for integration, across all three spheres (habitat, populations, and users). However, working on just two of the three may be adequate at times as opposed working simultaneously on all three spheres which can bog-down decision making.
- Inherent assumptions and tradeoffs must be considered, and they are not constant or linear.
- We must determine what we can actually influence with management (i.e., water in impoundments can be managed if available, but not weather). Additionally, we must consider the net change due to various management actions. For example, some practices make little difference depending on habitat in the surrounding landscape and some practices that benefit certain species reduce value for others (water depth for mallards vs. teal / rails).

Exercise Outcomes

1. *Greater familiarity and comfort with approaches for integrating multiple objectives and considering their tradeoffs.*
   We benefitted from the dedicated focus, breakout group interaction, and workshop discussion. This level of focus and information sharing could not have been effectively completed without a dedicated workshop.
2. *A better understanding of the suites of human dimensions outcomes that could be achieved via implementation of conservation-based habitat programs and land use policies.*

Simply working through the hypothetical JV situation, we found that seemingly simple challenges may not be simple (see influence diagram).

3. *A more explicit explanation and depiction of the putative relationships between program or policy implementation and anticipated bird population and hunter/societal responses.* Waterfowl management programs and practices are interrelated, and the workshop exercise helped reveal the obvious and often not so obvious relationships between decisions within and across programs. Moreover, the concept of "opportunity costs" and tradeoffs related to use of resources to achieve one objective vs. another provided vs. complementary approaches was informative.

APPENDIX 10 - **Breakout Group Summary for Waterfowl Management Integration within a Hypothetical Low Density Wintering Waterfowl Joint Venture**

Table A10-1. Summary of objectives, questions, actions, assumptions and trade-offs with respect to integrated objectives for people and habitat.

Integration	A framework within which decisions for multiple objectives are optimized (based on values)		
Mission	Use habitat delivery to achieve people, waterfowl and habitat objectives and engage with the NAWMP		
	Objective 1	Objective 2	Objective 3
	Increase use days at NWR and WMAs by 10% over 5 years	No net loss of wetlands by type and restore natural wetlands to TBD historical levels	Provide sufficient habitat to meet stepped-down NAWMP population objectives
Question	Is there enough habitat to support an increase of 10%? What communications and outreach activities are needed to meet goal?	Is there enough public support to increase wetland habitat to achieve this goal? Will the waterfowl use wetlands conserved for the purpose of maintaining EGS? What communications and outreach activities are needed to meet goal?	
Actions	Increase habitat quality for birds Increase habitat quality for people Increase in marketing (awareness of wetland access) Increase in quantity of habitat Quantify the amount of habitat needed to support increased use days	Protection of wetlands through policy changes Protection of wetlands through acquisition or easements Restoration of wetlands Quantify EGS benefits	
Assumptions	Increase in human use days will result in an increase in political and/or economic support Increase in the quantity/quality of wetland habitat will result in an increase in the number of birds and an increase in the use by people Distribution of habitat affects quality for people Increase in diversity of birds and habitat will result in an increase in human use	Assume that restoring wetlands will restore that EGS values Assume that man-made wetland types can provide EGS at levels equal to or sufficient with natural wetlands	

Trade-offs

Among user groups on public land (e.g., hunter and viewer conflicts in need/desires)

Distribution of habitat for people versus waterfowl versus EGS

Investment of $$ among three objectives, specifically science and delivery dollars

Disturbance of waterfowl associated with increased human use

Dilution of existing coordination capacity

Temporal: short term loss for long term gain

Table A10-2. Summary of lessons learned and future discussion points.

Lessons/Hang ups/places where we are still stuck	Comments
People versus Human Dimensions	People goals and Human dimensions tools and applications
Habitat as a fundamental objective	We think it is fundamental but struggled to define how and to articulate that in an objective
Force ourselves to have uncomfortable conversations into new areas	Need to have conversations and have the right people around the table to guide conversation and help to get to implementation
Speed at which we move will have great variation	Real-world impediments and time lags that need to be considered and addressed
Lots of opportunities for integration when you go through the process	But it's a difficult process and no way to speed it up
How are we going to measure success?	
A thoughtful and considered approach needs to be taken when "pitching" to management boards	Is this something the staff and technical people just do. Is it important enough to "just be done"?
Integration across the three objectives is one thing; integration at bigger scales (e.g., across the other bird plans) is a bigger elephant to eat	
Partners have to want it, participate in the development if we expect the planning product to have impact	
Acknowledge that this is a speculative investment	It will require resources but the expected pay-off is in the future