Joint Report from the GCJV and LMVJV Waterfowl Working Groups

Inter-regional coordination of the establishment, application, and interpretation of NAWMP population objectives for Joint Venture conservation planning

March 2018

BACKGROUND

Numerical population objectives of the NAWMP provide a common benchmark against which accomplishments can be measured and regional planning efforts can be consistently linked. The 2012 NAWMP prompted a revision of these objectives to ensure they reflect contemporary understanding and preferences of the waterfowl management community. Revised objectives were formalized in the 2014 Addendum to the 2012 NAWMP, thus providing Joint Ventures (JVs) with impetus to review and update corresponding regional population abundance objectives. Among the most important aspects of the revised NAWMP objectives was the establishment of dual objectives corresponding to the long-term average (1955–2014) and 80th percentile population levels. The dual objectives are intended to be complementary and help represent the dynamic nature of waterfowl habitats and populations, yet no guidance was provided on the appropriate application or interpretation of them.

Since 1986, JVs of importance during the non-breeding period have used various methods to calculate regional population objectives that are linked to the NAWMP, yet there has been little coordination among JVs to ensure complementarity or consistency in approaches. At large scales these inconsistencies could theoretically lead to inadequate or inefficient conservation efforts on behalf of continental waterfowl populations. At regional scales, these differences present communication challenges, as it is difficult to justify disparate approaches to conservation partners that engage with and help champion conservation priorities of multiple JVs.

The 2012 NAWMP provides an opportunity to seek greater consistency in planning approaches as regional population objectives and conservation planning models are updated. Additionally, recent technical work by the NAWMP Science Support Team and others in the NAWMP community has yielded tools and techniques that may make inter-regional planning more accessible and achievable. Recognizing the potential for logistical efficiencies and enhanced ecological outcomes, and wanting to avoid the aforementioned communication challenges for 2 JVs that share many partners, the GCJV and LMVJV made a commitment to work collaboratively on forthcoming revisions to regional population objectives, primarily focusing on 3 areas:

1. Methods for establishing JV population abundance objectives
2. Application of migration chronologies to calculate expected duck use-days (for eventual conversion to dietary energy demands)
3. Application and interpretation of the dual objectives articulated in the 2014 Addendum to the NAWMP

Collaboration on these topics was initiated in earnest at a joint meeting of the GCJV and LMVJV Waterfowl Working Groups at Rockefeller Refuge, March 6–7, 2018. This report summarizes the pertinent discussions and conclusions of that meeting, and identifies forthcoming tasks required to complete these collaborative efforts.

SUMMARY OF JOINT MEETING, MARCH 2018

Review of Fleming et al. revision of population abundance objectives

- The working groups generally approved of the method used by Fleming et al. to revise JV population abundance objectives, but acknowledged that some species were not addressed by this analysis (e.g., mottled duck, geese). Other species may require closer scrutiny and perhaps revision if local-scale data are available to provide more acceptable population abundance objectives (e.g., blue-winged teal, redhead).

- The working groups agreed in principle that objective 4D as calculated by Fleming et al. seems more appropriate for application in the GCJV and LMVJV, but additional thought and justification would be helpful.

- The working groups noted that for some species, objectives in Fleming et al. were substantially different from those currently in use by the GCJV and LMVJV. When revised objectives are presented for additional scrutiny or approval to the Waterfowl Working Groups, and eventually Management Boards, it will be necessary to identify the factors responsible for these differences and their relative contribution to the difference.
    - Changes in NAWMP population objectives
    - Changes in migration curves
    - Changes in continental distribution among JVs
    - Changes in method of calculation (i.e., Fleming et al. does not use MWS data)

Review of Brasher et al. analysis for consistent application of eBird migration data

- The working groups appreciated the progress made towards an empirically-based and repeatable method for constructing and applying migration curves to regional population abundance objectives. However, after only a brief review of eBird migration curves as generated through this application, the working groups expressed concern about their accuracy, with the severity of concern varying across species. Several potential biases in eBird data were quickly identified that could be responsible for perceived inaccurate migration patterns.

- Additional investigation and perhaps refinement of eBird migration curves will be necessary before the working groups gain comfort in their application. Comparison of eBird migration curves to other sources of migration chronology data should be a part of these investigations.

Application and interpretation of the LTA and 80th percentile objectives

- The NAWMP community generally recognizes that strict application of an average population value for habitat conservation planning will result in habitat conditions over the long term that fail to support populations at the upper end of the range associated with the average. Further, the long-term average and 80th percentile objectives of the 2012

NAWMP were not intended to be applied in isolation of one another, as both convey relevant information about the dynamics of waterfowl populations. This viewpoint was agreed upon by the GCJV and LMVJV working groups. Discussions therefore focused on interpreting and applying these complementary objectives to conservation planning.

- Introductory discussions centered around a close examination of 80th percentile values relative to long-term average, maximum, and recent breeding population sizes (Table 1). This provided important insights for understanding the potential biological implications of habitat objectives based on the LTA vs. 80th percentile.

- The working groups explored several options for interpreting the dual objectives, with 2 receiving the greatest consideration:
    1. Long-term average objective is viewed as the "floor" that we absolutely do not want to go below, while the 80th percentile is a higher level of capacity that the landscape needs to occasionally exceed, thereby demonstrating its continued potential to support waterfowl populations at the upper end of their historical range.
    2. Long-term average objective is viewed as an alarming level that, if not consistently exceeded by habitat conditions, would trigger concerted actions to accelerate conservation efforts. The 80th percentile is the objective we strive to achieve every year, while recognizing the need to preserve landscape conditions capable of periodically providing habitat above this level.

- After discussion, the working groups identified option 2 as the most biologically justified interpretation, based on the rationale described below.
    - A key aspect of the conversation was whether planning at the 80th percentile represented an unjustified level of investment, considering that population levels at or above the 80th percentile may occur infrequently, under the assumption that fluctuations in population size over the past 60 years provide a reasonable basis for future expectations. Over the long term, high population levels may indeed occur infrequently (e.g., < 20% of the time), but it seems unlikely that natural environmental conditions will be favorable, and thus waterfowl habitat abundant, on migration and wintering grounds during those same years. Important late winter and spring habitat manipulations are often implemented before continental breeding size for a given year is assessed. Because these and other logistical and financial constraints prevent managers from rapidly increasing winter habitat availability during years when breeding populations are large, planning at levels below the 80th percentile would likely result in the provision of insufficient habitat when it is needed most (i.e., when population levels are high).

    - Investigation of breeding population data revealed that even at the 80th percentile, we would be pursuing habitat objectives that are only 55−83% of the maximums observed over the period of record, which for several species have occurred in very recent years. Furthermore, breeding population size of total ducks and several individual species in the Traditional Survey Area

(TSA) have consistently exceeded the 80th percentile during a contemporary period (i.e., 2008–2017; Table 1). Adoption of anything other than a value near the 80th percentile risks a habitat shortfall at population levels that may be expected more frequently than otherwise assumed, at least based on recent population sizes and trends. Only northern pintail, scaup, and American wigeon consistently had breeding population sizes below the 80th percentile during 2008–2017 (Table 1). Of additional note was the observation that planning based on LTA values would result in habitat sufficient to support abundances that are only 39–71% of maximum population sizes.

- The working groups suggested the 80th percentile serves as an appropriate benchmark for planning as it provides a balance between the amount of habitat that would be needed at maximum population levels and that which guards against frequent habitat shortfalls, given the unpredictability of environmental conditions and its effects on habitat abundance.

- The working groups further concluded that the LTA and 80th percentiles are NOT to be interpreted as a range within which population and habitat levels would be deemed acceptable. Sustaining a resilient and diverse suite of waterfowl populations in North America at sizes and ranges experienced over the past 60 years (i.e., the basis for NAWMP population objectives) necessarily requires a habitat base that periodically supports populations at levels above the 80th percentile value.

Conclusions

- The GCJV and LMVJV waterfowl working groups agreed that the Fleming et al. and Brasher et al. analyses provide opportunities to help advance inter-regional planning around population and habitat objectives, but it was also recognized that additional scrutiny is needed, especially related to the use of eBird data for constructing migration curves.

- The GCJV and LMVJV achieved consensus on the interpretation and application of NAWMP long-term average and 80th percentile population objectives for conservation planning. Specifically, the groups agreed that the long-term average objective should be viewed as an alarming level that, if not consistently exceeded by habitat conditions, would trigger concerted actions to accelerate conservation efforts. The 80th percentile should be viewed as the objective we strive to achieve every year, while recognizing the need to preserve landscape conditions capable of periodically providing habitat above this level.

THE PATH FORWARD

The GCJV and LMVJV Waterfowl Working Groups agreed on the potential benefits of inter-regional planning for topics of mutual interest. Accordingly, the working groups committed to continuing their collaboration on the establishment, application, and interpretation of NAWMP revised population abundance objectives for conservation planning at the regional scale. The

groups identified 4 high priority tasks that should be completed or substantially advanced to inform discussions at a follow-up meeting of these groups during autumn 2018. These tasks are as follows:

I. Develop a more complete comparison of current and proposed revisions to GCJV and LMVJV population objectives.
    - This comparison should include the identification of factors contributing to the differences between current and revised objectives and their relative contribution to the overall difference. At minimum, these factors include changes in NAWMP population objectives, changes in migration curves, changes in distribution, and changes in method of calculation. Ultimately, these efforts should lead to the presentation of revised objectives to Management Boards and partners in a manner that is easier to comprehend and support.
    - Timeline: Initial progress to be made by autumn 2018
    - Who: Mike Brasher, Anne Mini

II. Investigate potential biases in eBird-based migration curves and search for opportunities to improve them.
    - An important first step will be contacting staff of the Cornell Lab of Ornithology to share our concerns and seek their input on workable solutions. Investigations into biases may require an examination of individual records in the eBird dataset to look for disparities between what is observed (i.e., recorded) vs. what is expected based on local knowledge of bird abundances (e.g., using local "hotspots" such as Cameron Prairie NWR as reference locations). Additional datasets that describe local or regional waterfowl migration chronology may be useful for comparison to and validation of eBird-based curves, and options for "highgrading" eBird data based on location, observer expertise, or other criteria should be explored. While numerous potential biases exist, 2 were notably identified by the waterfowl working groups:
        - Does increased effort or expertise being applied in association with the Christmas Bird Count contribute to inflated abundances during this time frame?
        - Are large concentrations of birds (i.e., ducks) likely to be consistently underestimated due to observers tiring from the effort required to enumerate large groups? We believe this phenomenon would artificially dampen the height of a migration curve, therefore forcing all daily abundances closer to the peak; and because this is the point at which the objective is anchored, this would lead to overestimating expected duck use-days and habitat needs. In other words, the more a migration curve is dampened, the closer each daily point, and thus relative duck abundance, is to the peak value.
    - Timeline: Autumn 2018
    - Who: Mike Brasher, Kevin Ringelman, Anne Mini

III. Explore finer partitioning of population abundance objectives and migration curves to accommodate geographic planning subregions of the GCJV (i.e., Initiative Areas) and LMVJV (i.e., MAV and WGCP).

- Calculating population abundance objectives for planning subregions should be defensible and easily accomplished. Construction and application of finer-scale migration curves, while feasible, will require additional effort and may enhance any biases or shortcomings of the eBird dataset. The availability of local migration chronology data not derived from eBird should be explored and considered for application in place of eBird data, if necessary.
- Timeline: Initial progress to be made by autumn 2018
- Who: Mike Brasher, Anne Mini, others

IV. Commit to a timeline for formal updating of JV population and habitat objectives.
- The GCJV is expecting an update to occur over the next 18 months, with autumn 2019 as a viable time frame for initial presentation to the Management Board. The LMVJV expects an update to be completed and available for Board review during 2020.
- Who: Mike Brasher, Anne Mini, GCJV and LMVJV Waterfowl Working Groups

Responsibility for ensuring momentum is maintained and progress is made on each of these tasks will fall primarily on GCJV and LMVJV science staff (Mike Brasher and Anne Mini). The follow-up meeting should occur prior to December 2018.

LITERATURE CITED

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Fleming, K. K., M. G. Brasher, M. M. Mitchell, D. D. Humburg, M. J. Petrie, J. C. Coluccy, and J. D. James. *In prep.* Derivation of regional, non-breeding population abundance objectives to inform conservation planning – revised. North American Waterfowl Management Plan Science Support Team Technical Report 201x–0x.

U.S. Fish and Wildlife Service. 2016. Waterfowl population status, 2016. U.S. Department of the Interior, Washington, D.C. USA.

Table 1. Long-term average (LTA), 80th percentile, and maximum breeding population size of 10 species / species groups in the traditional survey area over the period 1955−2014. Values are also presented characterizing the LTA and 80th percentile as a percentage of the maximum and summarizing recent trends in breeding population size relative to the 80th percentile.

Species	LTA	80th percentile	Maximum	LTA as % of Maximum	80th Percentile as % of Maximum	No. of years from 2008-17 with BPOP > 80th percentile
MALL	7,726	9,297	11,234	69%	83%	6
GADW	1,921	2,977	3,897	49%	76%	9
AMWI	2,596	3,048	3,788	69%	80%	3
AGWT	2,059	2,631	3,476	59%	76%	10
BWTE	4,949	6,329	9,242	54%	68%	10
NSHO	2,515	3,592	5,279	48%	68%	9
NOPI	4,003	5,722	10,373	39%	55%	0
REDH	701	918	1,356	52%	68%	10
CANV	581	691	865	67%	80%	6
SCAUP	5,026	5,984	7,997	63%	75%	0
Total ducks	34,703	40,748	49,152	71%	83%	9

[a] MALL = Mallard; GADW = Gadwall; AMWI = American wigeon; AGWT = American green-winged teal; BWTE = blue-winged teal; NSHO = Northern shoveler; NOPI = Northern pintail; REDH = Redhead; CANV = Canvasback; SCAUP = Lesser and greater scaup; Total ducks = Total breeding ducks in Traditional Survey Area as reported in Appendix C of the annual Waterfowl Population Status report (e.g., US Fish and Wildlife Service 2016).