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Stakeholder perspectives on raptor conservation and falconry in North America

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ABSTRACT

Global raptor conservation depends on non-governmental conservation organizations (NGCOs) and, fundamentally, members of those organizations. But while NGCOs declare a central mission, their membership may be more varied. This can pose a challenge to a NGCO in terms of developing programs and advocacy that reflects its membership's preference and likelihood of support. Systematic assessment of members' preferences and opinions is needed to assure alignment with an organization's actions. Using the North American Falconers Association (NAFA) as a NGCO case study, members' preferences and opinions on issues related to raptor conservation were assessed. Results suggest a consensus among participants that conservation should include habitats and species; prairie, sage, and wetland habitats are the most salient habitat issues and perceived declines in native game bird, waterfowl, and small game mammals are the most salient wildlife issues. Tied to these concerns of habitat and species was land access to practice falconry. Overall, results suggest participants prefer organizational resources be used to support prairie habitat and grouse species conservation. For NGCOs, systematic membership surveys can provide substantial insight for decision-making and effective allocation of membership-derived resources. Member surveys also signal an organizations willingness to listen to its constituents and act upon their views and local knowledge to coordinate conservation action.

1. Introduction

Globally, raptors face challenges posed by human persecution and anthropogenic disturbance to habitat, prey species, and environmental quality, as well as the zeitgeist of executive or legislative policy (in)action (Donázar et al., 2016; McClure et al., 2018; Buechley et al., 2019). The conservation of raptors relies on coalitions of public and private sector organizations to mitigate conflict and reach consensus (Redpath et al., 2013). To effectively build coalitions, it is crucial that the opinions, preferences, and knowledge of each organization's members are known or somehow apparent (Dayer et al., 2020). Systematic efforts to gather such data can benefit an organization by reducing potential conflict between administrative operations and the membership's desires or increase financial and in-kind support. Moreover, systematic data collection can identify similarities or differences among members, (mis)alignment with an organization's mission or priorities, or inform coordinated

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actions that contribute to "big tent" coalitions between non-governmental conservation organizations (NGCOs) (Wondolleck and Yaffee, 2000; Guerrero et al., 2015).

Within the network of bird and raptor NGCOs, falconers and organizations that represent their interests are a stakeholder group whose spectrum of beliefs and policy support are relatively unexplored (Cooper et al., 2015; Wilkins et al., 2019). Yet, unlike other NGCO stakeholders, falconers are embedded within a living human heritage that intrinsically builds its practitioners' local ecological knowledge of raptors and their habitat, prey, and environmental conditions (Fuertes, 1920, UNESCO, 2016). That distinction situates falconers as an essential component a NGCO's conservation prioritization process. Here, we use the membership of the North American Falconers Association (NAFA) as a case study to explore members' opinions, preferences, and knowledge of species, habitats, and environmental trends to demonstrate how those can inform the conservation prioritization process of a NGCO. We contend simple systematic membership evaluations can aid NGCOs to align their conservation goals and investments with the conservation preferences and priorities of their membership, who, ultimately, provide essential monetary and non-monetary support.

1.1. Falconry in North America

Falconry is defined as the taking of wild quarry in its natural state and habitat by means of a trained raptor. The sport's origins are Central Asia, China, and Mesopotamia in the third millennium BC (McGough, 2019). Unique among hunting sports, falconry is recognized as a culture—built and sustained by local ecological knowledge through interactions with varied species and habitats (UNESCO, 2016). Accordingly, falconers can serve as a "canary" for NGCOs given their propensity to spend substantial time on-the-ground scouting, training, and hunting for various species in various habitats. Moreover, many of the species falconers hunt, as well as raptors themselves, are considered bioindicator species (Carew et al., 2013; Donázar, 2016). These traits situate falconers and representative organizations at a unique nexus of conservation. As such, the local ecological knowledge of falconers, like those who are members of NAFA, can be used to supplement the identification of conservation issues and priorities.

In North America, falconry dates to the early twentieth century (Fuertes, 1920). Following a period of popularity and formal regulation, NAFA was founded in 1961. During the latter half of the twentieth century, falconry became entwined with the environmental movement as raptor populations declined (Carson, 1962; Cade, 1988). Practitioners of the sport of falconry are now present across North America, which is indicative of the range of habitats, prey, and land types falconers have consistent and direct experience with. Falconers are, therefore, presumably exposed to myriad conservation challenges on public and private land, as well as to quarry subject to varied challenges.

1.2. Current study

Pursuit of varied quarry within diverse habitats suggests falconers may hold a plurality of preferences for and opinions on the conservation goals and investments they believe a NGCO should support (Kenward, 2009). Social research methods for biodiversity conservation can be used by NGCOs to understand their members and identify segments and typologies (Stem et al., 2005; Sandbrook et al., 2013). The objective of the present study—initiated by the NAFA Conservation Committee—is to provide an assessment of membership demographics, conservation views, and opinion on issues relevant to raptor conservation and falconry. That objective is guided by research questions related to quarry species, wildlife habitat, land access, and conservation policy: (a) how do North American falconers define conservation, (b) how do falconers rank general conservation topics and policy issues in terms of importance, (c) how do they perceive trends in prey species, wildlife habitat, and land accessibility, and (d) what differences exist among falconer type and region? This exploratory study contributes an investigation of a unique conservation stakeholder group of historical and cultural importance, globally, and demonstrates an efficient systematic evaluation implemented by a NGCO to assess the composition of their membership in relation to conservation priorities and preferences.

2. Methods

2.1. Participants and sampling

The target population were members of NAFA ($N = 2713$). Membership requires a valid email address; as such, the population and sample frame are synonymous for this cross-sectional study. Email invitations were sent on December 12, 2018 that included a link to a Qualtrics-hosted questionnaire. After accounting for undeliverable emails and opt-outs, 2587 eligible participants received invitations. Following a modified tailored design protocol, participants were contacted up to four times, approximately one-week apart, until they completed or opted-out of the survey (Dillman et al., 2014). The University of Nebraska at Kearney Institutional Review Board approved all procedures and materials (#052918−2). Data analysis was conducted with SPSS Statistics for Windows, version 23 (IBM Corp, 2015).

2.2. Materials and measures

Participants' preferences and opinions were measured across contemporary falconry and raptor conservation topics related to species, habitat, and land management/access, and policy. To understand how NAFA members define conservation, participants were asked two binary questions (yes/no): "conservation is managing species" and "conservation is managing habitat". Next, participants were asked to choose their primary and secondary conservation concern—habitat, raptor, or prey species—via two questions, "what is your most important concern in conservation practice" and "what is the second most important concern in conservation practice".

The first section of the questionnaire focused on wildlife species. Participants rated the importance of general wildlife species in relation to how they perceived their population status on a unipolar scale, 1 (not important, populations stable)−10 (extremely important, populations declining): raptors, small game mammals, nonnative game birds, native birds, waterfowl, and other. Participants then rated their belief that three general prey groups—grouse, ducks, and rabbits—are in decline on a bipolar scale of 1 (definitely true)−5 (definitely false). Next, on a scale of 1 (populations stable)−10 (populations declining), participants rated the populations of specific prey species: cottontail rabbits, black-tailed jackrabbits, white-tailed jackrabbits, squirrel, duck (small), duck (large), sage grouse, sharp-tailed grouse, lesser prairie chicken, greater prairie chicken, dove, chukar, Hungarian partridge, pheasant, quail.

The next section focused on habitat and land management. Participants rated the importance of specific habitats in relation to how they perceived their presence on the landscape, 1 (not important, habitat well-represented)−10 (extremely important, habitat declining): short grass prairie, tall grass prairie, deciduous forests, temperate conifer forests, boreal forests, wetlands, sagebrush/shrub steppe, desert/mesic shrub, private agricultural lands, and other. Participants then rated their belief that four general habitat types—prairies, wetlands, small ponds, and forests—are in decline, 1 (definitely true)−5 (definitely false). To assess perceptions of land access, participants ranked general access on a 3-point rating scale (great, good, poor). Participants then rated access to the previously measured specific habitat types, 1 (habitat present but not accessible)−10 (habitat present and completely accessible). Next, participants rated their belief that access to sage, desert, private agriculture lands are in decline, 1 (definitely true)−5 (definitely false).

In the next section, participants rated their perception of the prioritization conservation policy issues receive at the federal and state/provincial level, 1 (appropriately prioritized)−10 (critically under-prioritized). Federal-level items were: conservation of raptor species of concern, Greater Sage Grouse, Lesser Prairie Chicken, waterfowl; management of mineral and/or energy development, contaminants, climate change, invasive species, poaching and/or illegal trade in wildlife; funding for state conservation in the Farm Bill. State- and provincial-level items were: conservation of state-listed/species of concern raptor species, small mammal game species, upland bird species, key raptor prey species; management of mineral and/or energy development, residential development, contaminants, poaching and/or illegal trade in wildlife, climate change, invasive species; funding for state agency, conservation in the Farm Bill; private land access, and state land access.

Falconer type was measured as longwinger, austringer, or both (a longwinger flies falcons; austringers fly hawks/buzzards). Geographical information was measured by regional chapter membership and state/province/territory. Regional chapter membership was measured as follows: Northeast (CT, ME, MA, NH, NJ, NY, PA, RI, VT), Southeast (AL, DE, DC, FL, GA, KY, LA, MD, MS, NC, SC, PR, TN, VA, WV), Great Lakes (IL, IN, MI, OH, WI), Central (AR, IA, KS, MN, MO, NE, ND, SD, OK, TX, Mexico), Mountain (AZ, CO, ID, MT, NM, UT, WY), South Pacific (CA, HI, NV), North Pacific (AK, OR, WA), and Canada. Participants then indicated their specific state, province, or territory. Two demographic measures were collected as categorical variables: age (19−24, 25−33, 34−42, 43−49, 50−54, 55−62, >63) and gender (female, male, other).

3. Results

A total of 443 partial-completes or full-completes were returned for an effective response rate of 17.1% (AAPOR, 2016). Participants were primarily male (84.4%), aged 55+ (65.9%), and based in the United States (88.7%). An additional regional bias was observed towards states in mountain (23.0%), central (18.2%), and southeast (16.6%) regions (Table 1). Participants were primarily austringers (40.4%) or both (38.4%). The pattern of self-identified austringer or both followed in most regions but reversed in the mountain region (Table 2).

The majority of participants indicate conservation is the management of both habitat and species (90.1%); few define it as the management of habitat only (8.8%). Many participants indicate their primary conservation concern is habitat (82.3%) followed by prey species (9.2%) and raptors (8.5%); their secondary was prey species (63.2%), raptors (21.3%), and habitat (15.6%).

Participants indicated, based on mean ratings, that native game birds (8.63 ± 1.74) were the most important wildlife conservation issue, followed by waterfowl (7.65 ± 2.24), small game mammals (7.10 ± 2.54), raptors (6.65 ± 2.70), and nonnative game birds (4.94 ± 2.88). Statistically significant differences among importance ratings were observed, based on Kendall's coefficient of concordance ($W = 0.35$, $\chi^2_4 = 604.15$, $P < .001$). Post-hoc comparisons (Dunn's test) observed statistically significant differences between all species except raptors and small game mammals ($\chi^2 = -2.71$, $P = .67$). Comparisons across austringer and longwinger falconer type revealed no differences between species, except raptors ($t_{235} = 3.26$, $P < .001$, 95% CI = 0.47−1.92) (Table 3). In terms of regions, significant differences between raptor ($\chi^2_7 = 25.25$, $P < .001$), small game ($\chi^2_7 = 21.19$, $P = .003$), and waterfowl ($\chi^2_7 = 19.07$, $P = .008$) ratings based on region were observed using Kruskal−Wallis test procedures.

Table 1
Distribution of age, gender, region, state, and falconer type in the winter 2018 NAFA membership survey sample.

Response variable	Response category	Count	Percentage
Age ($n = 437$)	19–24	5	1.1
	25–33	34	7.8
	34–42	41	9.4
	43–49	38	8.7
	50–54	31	7.1
	55–62	120	27.5
	63+	168	38.4
Gender ($n = 437$)	Male	369	84.4
	Female	66	15.1
	Other	2	.5
Falconer type ($n = 391$)	Austringer	158	40.4
	Longwinger	83	21.2
	Both	150	38.4
Region ($n = 439$)	Mountain (US)	101	23.0
	Central (US/Mexico)	80	18.2
	Southeast (US)	73	16.6
	Great Lakes (US)	50	11.4
	Northeast (US)	46	10.5
	S. Pacific (US)	36	8.2
	N. Pacific (US)	34	7.7
	Canada	19	4.3

Table 2
Geographic distribution of falconer type by NAFA region ($n = 391$).

Region	Austringer	Longwinger	Both
Northeast	20	7	16
Southeast	36	5	18
Great Lakes	31	2	9
Central	29	11	33
Mountain	17	36	41
South Pacific	11	6	16
North Pacific	10	5	14
Canada	4	11	3

Table 3
Mean rating of most important wildlife conservation issue by falconer type ($n = 391$).

Species[a]	Both	Austringer	Longwinger
Native game birds	8.7	8.5	9.0
Waterfowl	7.6	7.8	7.8
Others	7.1	6.9	6.8
Small game mammals	6.9	7.6	6.6
Raptors	6.6	7.2[b]	6.0[b]
Non-native game birds	4.8	5.1	4.9

[a] Rating scale is 1 not important – 10 extremely important.
[b] Statistically significant difference at the P < .001 level.

In terms of general prey groups, results indicate that participants believe grouse (1.57 ± 0.71), rabbit (0.19 ± 1.05), and duck (2.55 ± 0.99) populations are in decline, with pairwise mean comparison indicating statistically significant differences among each pair. In terms of specific prey species, based on mean ratings, participants perceived sage (8.37 ± 1.88) and sharp-tailed grouse (7.94 ± 2.03) and the greater (8.29 ± 2.04) and lesser prairie chicken (8.41 ± 2.06) populations declining more steeply as compared to other game bird, rabbits/hares, and rodent prey species (range = 7.14–3.86). No significant differences were observed between region or falconer type.

Related to habitat, mean response ratings indicate that tallgrass prairie (8.45 ± 1.89), shortgrass prairie (8.33 ± 1.90), wetland (8.24 ± 2.03), and sagebrush (8.07 ± 2.17) are the most important habitat issues to participants. Statistically significant differences among ratings of importance were observed, based on Kendall's coefficient of concordance ($W = 0.22$, $\chi^2_8 = 664.05$, $P < .001$). Regional differences were observed in terms of the importance of wetland ($\chi^2_7 = 15.90$, $P = .026$), sagebrush ($\chi^2_7 = 15.77$, $P = .027$), desert shrublands ($\chi^2_7 = 20.23$, $P = .005$), deciduous forests ($\chi^2_7 = 32.16$, $P < .001$), temperate forests ($\chi^2_7 = 23.47$, $P < .001$), and private agricultural habitats ($\chi^2_7 = 28.09$, $P < .001$). Perceptions that specific habitats are in decline indicate that prairies (1.37 ± 0.64) are believed to be experiencing the most decline, followed by wetlands (1.60 ± 0.82), small ponds (1.88 ± 0.97), and forests (1.95 ± 0.98) (Table 4).

Table 4
Mean rating and standard deviation of wildlife habitat importance by regional NAFA chapter. Wetland and agriculture are single indicators, all other categories are composite scores derived from multiple specific items aggregated to the general habitat type ($n = 417$).

Region[a]	Prairies[b]	Forests[c]	Wetlands	Desert[d]	Agriculture
Northeast	8.3 (2.0)	7.4 (2.2)	8.0 (2.3)	7.5 (2.3)	7.0 (2.7)
Southeast	8.4 (1.8)	7.9 (1.8)	8.6 (1.7)	7.9 (2.1)	7.0 (3.0)
Great Lakes	8.1 (1.6)	6.4 (2.1)	7.5 (2.4)	6.8 (2.3)	5.4 (2.9)
Central	8.5 (1.7)	6.6 (2.5)	8.1 (2.3)	7.5 (2.2)	5.0 (3.0)
Mountain	8.6 (1.7)	7.0 (2.2)	8.5 (1.8)	8.2 (1.9)	5.5 (3.0)
South Pacific	8.2 (1.9)	7.5 (2.4)	8.9 (1.9)	8.0 (2.3)	6.3 (2.9)
North Pacific	8.4 (1.8)	6.4 (2.2)	8.1 (1.9)	7.9 (1.8)	5.3 (2.9)
Canada	8.2 (2.2)	5.9 (2.8)	7.8 (1.7)	6.3 (2.7)	4.7 (3.7)

[a] Rating scale is 1 not important – 10 extremely important.
[b] Composite of short grass prairie and tall grass prairie items.
[c] Composite of deciduous forest, temperate conifer forest, and boreal forest items.
[d] Composite of sagebrush/shrub-steppe (high desert) and desert/mesic shrub (low desert) items.

Perceptions of access to hunting lands were rated by many participants as "good" (51.3%), few as "great" (11.7%), and over one-third rating as "poor" (36.8%). Prairie habitat access (2.07 ± 0.64) was perceived to be in the most decline, followed by sagebrush (2.22 ± 1.02), agricultural lands (2.45 ± 1.03), and upland desert landscapes (2.35 ± 1.20). Responses indicate that tallgrass prairie (3.83 ± 2.62), boreal forest (4.23 ± 2.87), shortgrass prairie (4.27 ± 2.67), and desert shrubland (4.29 ± 3.11) are considered the least accessible habitat. Statistically significant differences among ratings of accessibility were observed ($W = 0.06$, $\chi^2_{10} = 189.07$, $P < .001$). Post-hoc comparison by region followed a trend of the habitat's general presence in the region.

Participants ranked all conservation policy issues at the federal level above the mid-point on the 10-point response scale (x = 6.53). The highest ranked issues were management of contaminants (7.30 ± 2.78), conservation of sage grouse (7.10 ± 2.77), climate change (7.03 ± 3.22), conservation of lesser prairie chicken (6.98 ± 2.80), and management of invasive species (6.91 ± 2.78). At the state/provincial level, participants also ranked all issues above the mid-point (x = 6.21). The highest ranked issues at the state/provincial level were housing development (7.13 ± 2.92), management of contaminants (6.87 ± 2.86), private land access (6.78 ± 2.76), funding of state agencies responsible for wildlife management (6.62 ± 2.75), and climate change (6.45 ± 3.18). No statistically significant regional or falconer type differences were observed.

4. Discussion

To understand a membership-based NGCO, this research used NAFA as a case study to assess members' views on conservation issues relevant to raptor conservation and falconry—wildlife habitat, quarry species, land access, and conservation policy. Results indicate NAFA members believe conservation encompasses both habitat and species but are most concerned about habitat conservation, first and foremost. In relation to both importance and prioritization of habitat, the prominence of prairies, sagebrush, and wetlands are concomitant with the interaction between regional geography and prey species. As a hunting sport, quarry—and by association habitat—is of utmost importance as it is the core of the relationship and experience falconers seek with a wild raptor. That is also reflected in a primary concern for native bird, waterfowl, and small mammal conservation rather than raptors. Results also reveal notable differences among falconer types and geographic regions, which provides insight for a membership-based NGCO with continental-wide operations.

Overall, members appear to recognize the important connection between habitat and prey. This is a critical finding as a preference for prey species would necessitate informing members about the innate role habitat plays in sustaining wildlife. Instead, the NGCO can directly engage with their membership to develop habitat conservation and management initiatives, knowing members understand the benefit wildlife (prey species) will receive as a result (Jenkins, 2003). Interestingly, prey conservation is of greater concern to study participants than raptor conservation. One could assume NAFA members prefer raptor-focused conservation but instead prefer to conserve raptors via the indirect route of habitat- and prey-focused conservation. For example, grouse, rabbits/hares, and waterfowl species are of greater concern than raptors, due to these species' importance as a quarry and the nature of falconry as a hunting sport. In some sense, a prey focus broadens an organization's conservation perspective as it does not exclude raptors but allows raptor conservation to be viewed with a different lens; one that includes and prioritizes habitat as well as primary and secondary consumers.

Members seem to be aware of the unprecedented loss of prairie, sage, and wetland habitat in North America. Prairie landscapes that intersperse the continent are the least protected biome worldwide, which has resulted in the large-scale loss and desertification of habitats and the species that rely on them (White et al., 2000; Hoekstra et al., 2004; Pennisi, 2019; Rosenberg et al., 2019). The Great Plains have experienced extensive grassland conversion to agriculture and temperate grasslands have suffered greater species "loss" than any other North American biome (Forrest et al., 2004; Laliberte and Ripple, 2004; Drummond and Auch, 2016). Interestingly, no regional difference was observed in terms of the belief that prairie habitat is in decline, whereas other habitats did show reginal differences; that is, prairie habitat was consistently a high concern among all participants. This suggests the importance of prairie habitat to members but also that, perhaps, the

NAFA membership is well-informed about prairie loss. This concern could also be a construct of most participating members residing in NAFA regions that have considerable prairie or remnant habitat, i.e. the Great Lakes, Central, and Mountain regions. In either case, it is potentially indicative of an overarching conservation concern among members that can direct the organization's conservation outreach and programmatic development (Adams et al., 1997).

Tied intrinsically to concerns of habitat loss is access to that habitat for falconry, i.e., hunting. While results suggest many NAFA members feel they have "good" access, over one-third indicated "poor" access. These results mirror trends in actual and perceived access observed among the general hunting population in the United States (Responsive Management and National Shooting Sports Foundation, 2010). One caveat to our interpretation of these results is the potential that participants conflated perceptions of declining access with perceptions of habitat loss. If there are interdependencies between actual and perceived access and habitat loss, there may be a need to prioritize access alongside habitat conservation for falconers. That is, the tractability of issues like habitat conservation or preservation among a specialized interest group is often tied to "what's in it for me" compromises wherein access is the hook that garners support and/or participation (Lindstad, 2018).

In terms of concern for habitat, it is sensible for an organization like NAFA to assume regional distinctions among its members exist. For instance, one could presume habitat conservation preferences for forests in the Northeast or Southeast, agriculture landscapes in the Great Lakes and Central regions, or upland deserts and sagebrush in the Pacific regions and Mexico. However, our results did not detect a discernible or statistically significant pattern of habitat concern by region. Focused, coordinated, regional-specific efforts may not be logistically feasible for a NGCO like NAFA, which is volunteer-based and operates on a negligible budget. In the case of wetlands, while immensely important from an ecological perspective, within the context of falconry they are limited both in terms of the quarry they provide, the falconry species capable of hunting available quarry, and accessibility. As such, the identification of prairie habitat as a consensus concern is an exemplar of the benefit provided by assessment of an NGCO's membership. With that consensus concern identified, the organization can begin to develop strategic conservation programming, partnerships, and investment plans.

In terms of sociodemographics, while participants were skewed towards males over the age of 55, this audience segment represents the largest block of NAFA membership and the United States' general hunter population (Fish and Wildlife Service and Census Bureau, 2016). Though younger male and female demographics exist within falconry, generally, those audiences are likely either not targeted for recruitment or not effectively engaged when they are, resulting in the skewed age structure. However, it should be noted that regulations, financial costs, and time commitments associated with entering falconry disproportionality act as barriers to younger populations (Schroeder et al., 2012; Hinrichs, 2019).

Conflict or disagreement between falconer types is inevitable as each necessitates a practice focused on specific raptors, quarry, and habitat. Yet, the only observed difference between the two practices, austringer and longwinger, was the importance of raptor conservation. This may be a result of the historic and current protection status each groups' preferred falconry species. Longwingers, who rated raptor conservation as less important, fly falcons, primarily a peregrine in North America, but also the gyrfalcon (*Falco rusticolus*) or prairie falcon (*Falco mexicanus*). The peregrine, in particular, was previously listed as federally endangered, and though delisted, is well-protected at the state and international level. Conversely, austringers may not view their preferred falconry species as having had or having the same protections afforded to longwings. For example, the red-tailed hawk (*Buteo jamaicensis*) or goshawk (*Accipiter gentilis*), common across North America and within falconry, have been historically persecuted and receive limited protection (Bildstein, 2008). These divergent histories and protection statuses offer a plausible explanation, but further investigation is warranted.

4.1. Implications for conservation coalitions

A broad coalition is an imperative to conservation success (Beier et al., 2017). Based on these exploratory results, a multitude of perspectives exist within NAFA such that its conservation orientation cannot be singular—it must be adaptive and responsive to its diverse membership. The implication is that NAFA must support a big tent conservation mindset that encourages a plurality of views, and their expression by its members. This conclusion may also have relevance to or be valid for other NGCOs. While heterogeneity can have its drawbacks for a small NGCO with a specialized membership profile, that heterogeneity should be viewed as an opportunity to synergize its initiatives via partnerships. Given observed preferences for prairie habitat and grouse species, the organization could, for example, partner with the Sage Grouse Foundation, regional Nature Conservancy initiatives, or local Audubon chapters. Concerns for native game bird species, waterfowl, and small game suggest partners like Ducks Unlimited, Delta Waterfowl, Quails Forever, the Rough Grouse Society, or other hunting conservation organizations would be supported by the membership. Given regional distinctions, partnerships beyond the consensus prairie focus may be geographically specific. These could include, for example, regional partnerships between a local NAFA chapter and Ducks Unlimited where waterfowl are a more prominent quarry, Nature Conservancy and Cattlemen's Association in upland rangelands, or timber corporations or family forest owners in forest-dominant regions. While central governance is necessary, semi-independent regional initiatives and partnerships may facilitate effective coalitions among various and differentially oriented conservation organizations (Hine, 1997).

4.2. Limitations and future research

As established quantitative survey research methods were used, limitations should be considered in terms of coverage, sampling, response, and measurement (de Leeuw et al., 2008). Error associated with response and measurement are most

salient. First, the relatively low response rate without a non-response procedure limits understanding of systematic differences between participants and non-participants. Constraints on research logistics specific to time and staff made a non-response effort infeasible. However, given the sociodemographic homogeneity of NAFA members it may be assumed that difference associated with contact and response mode are limited (Couper, 2017). Measurement error associated with questionnaire design or question wording is also worth noting. For example, the survey instrument did not distinguish between wild and trained raptors; doing so may have revealed a higher rate of concern for wild raptors as issues of persecution, poisoning, and habitat loss persist (McClure et al., 2018). Other limitations with measurement may be associated with variation in response scales, i.e., using both 1–10 and 1–5, and their polarity, i.e., using both uni- and bipolar scales. Finally, the presented research is atheoretical, and future research would benefit from a systematic application of theory to connect this work to phenomena observed in other contexts, particularly to understand member segments and typologies (Martin, 2020).

4.3. Conclusion

Any NGCO that endeavors to support conservation on behalf of its members must acquire relevant information about its membership's conservation preferences and understand their views of conservation itself. Our results suggest simple systematic investigations can reveal important areas of consensus and disagreement among dues-paying members. In terms of actionable results, the members survey suggests NAFA can focus conservation effort on prairie habitat as it integrates members' habitat and prey species concerns. Tied to habitat and prey is an identified need for NAFA to support and help members (a) secure access to hunting lands and (b) focus on grouse, waterfowl, and small mammal species conservation. Moreover, given the dearth of conservation efforts directed at rabbits/hares, NAFA may consider their position and take a lead role in the development of conservation initiatives. Collectively, the results of this NGCO members survey identified internal prospects and potential avenues to establish synergistic conservation initiatives, given the broad array of members' concerns, under a big tent of bird conservation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.gecco.2020.e01280.

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