1 Stakeholder perspectives on raptor conservation and falconry in North America

2 Running head: Raptor conservation perspectives

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Abstract

Global raptor conservation depends on non-profit and non-governmental organizations and, fundamentally, members of those organizations. While an organization may have a central mission, internally, its membership can be diverse. This can pose a challenge to a member-driven organization to implement programming and advocacy that reflects its membership's preference and likelihood of supporting those programs. Systematic assessment of members' opinions and preferences is needed to assure alignment with the organization's actions. Using the North American Falconers Association (NAFA) as a case study, preferences and opinions on issues related to raptor conservation were assessed. Based on species, habitat, management, and policy topic areas, results indicate participants define conservation as encompassing both habitat and species. Consensus habitat issues were threats to prairies, sage, and wetlands. Perceived declines in native game bird, waterfowl, and small game mammals were the most salient threats to wildlife. Tied to these concerns of habitat and species was access to land to practice falconry. Overall, participants prefer that organizational resources are used to support habitat conservation and facilitate falconers' access to those habitats. For non-governmental conservation organizations, 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.

Keywords: Birds of prey, Falconer, Human dimensions, Conservation social science, Public opinion research

Introduction

Raptor populations, globally, face challenges posed by human persecution, anthropogenic disturbance to habitat, prey availability, and environmental pollution, as well as the zeitgeist of executive or legislative environmental policy (in)action (Donazar et al. 2016, McClure et al. 2018, Buechley et al. 2019). The conservation of raptors relies on coalitions of public and private stakeholder groups to mitigate conflict and reach consensus (Redpath et al. 2013). Crucial to coalition-building is that the opinions, preferences, and beliefs of stakeholders are known or somehow apparent (Dayer et al. 2020). Systematic efforts that lead to the identification of similarities or differences among stakeholders may lead to coordinated conservation actions or contribute to big tent conservation aspirations (Wondolleck and Yaffee 2000, Guerrero et al. 2015). Falconers and falconry organizations are a stakeholder group within the raptor conservation network whose spectrum of beliefs and policy support are relatively unexplored (Cooper et al. 2015, Wilkins et al. 2019). Yet, like other bird conservation stakeholders, falconers are crucial to wildlife conservation and management.

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). In North America, falconry dates to the early twentieth century (Fuentes 1920). Following a period of popularity and formal regulation, the North American Falconers Association (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 quarry subject to varied conservation challenges.

Unique among hunting sports, falconry is recognized as a culture, built and sustained by local ecological knowledge through interactions with varied species and habitats (United Nations Educational, Scientific and Cultural Organization 2010). Accordingly, falconers can serve as a “canary” for environmental change given their propensity to spend substantial time on-the-ground scouting, training, and hunting for various species in various habitats. Moreover, many quarry species falconers pursue are considered bioindicator species (Carew et al. 2013). These traits situate falconry and its organizations at a unique nexus of conservation. As such, surveys of falconers, like those enrolled as members of NAFA, could therefore be used to identify priorities for conservation. However, falconers’ 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 conservation organization should support (Kenward 2009).

Falconry, like other hunting sports in North America, operates within a public trust-based wildlife management framework (Organ et al. 2012). Within this framework, human dimensions research and public involvement are essential components (Decker et al. 2012, Sandbrook et al. 2013). That research may investigate in-group/out-group dynamics (Buijs et al. 2012), inter- and intra-group relationships (Lute and Gore 2014), sociocultural shifts (Manfredo et al. 2020), and relevancy maintenance (Association of Fish and Wildlife Agencies, 2019). Non-governmental conservation organizations (NGCOs) that work with hunters and non-hunters to sustain and improve natural resources can use human dimensions assessments to understand membership segments and typologies (Stem et al. 2005, Sandbrook et al. 2019). Such assessments aid an organization to align its conservation goals and investments with the conservation preference and priorities of its membership, who, ultimately, provide essential monetary and non-monetary capacity.

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 falconry. That objective is guided by research questions related to issues of wildlife habitat, quarry species, land access, and conservation policy: (a) how do North American falconers define conservation (b) how do North American falconers rank the importance of general conservation topics and policy issues, (c) how do North American falconers 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 to NGCOs a systematic evaluation to assess the homo- or heterogeneity of their membership in relation to conservation priorities and initiatives.

Methods

Participants and Sampling

The target population were members of NAFA. Membership requires a valid email address; as such, the population and sample frame are synonymous this cross-sectional study. Email invitations were sent on 12 December 2018 that included a link to a Qualtrics-hosted questionnaire. After accounting for undeliverable and opt-outs, 2,587 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). A total of 443 partial or full-completes were returned for an effective response rate of 17.1%, based on the definition established by the American Association of Public Opinion Research (AAPOR 2016). The University of Nebraska 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).

Materials and Measures

Participants' preferences and opinions were measured across contemporary topics related to conservation, 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 practices” and “what is the second most important concern in conservation practices”.

The first section of the questionnaire focused on species. Participants were asked rate the importance of wildlife population issues to North American falconers, unipolar scale, 1 (not important)—10 (extremely important): raptor populations, small game mammal populations, nonnative game bird populations, native bird populations, waterfowl populations, other. Participants were then asked to rate their belief that three general prey groups are in decline—grouse, ducks, and rabbits—on a bipolar scale of 1 (definitely true)—5 (definitely false). Next, on a scale of 1 (populations stable)—10 (populations sharply declining), participants asked “what would you say is occurring in each of the prey populations”: 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 were asked rate the importance wildlife habitat issues, unipolar scale 1 (not important)—10 (extremely important): 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 were then asked to rate their belief that four general habitat types are in decline—prairies, wetlands, small ponds, and forests—on a bipolar scale of 1 (definitely true)—5 (definitely false). To understand perceptions of hunting land access, participants were ranked their access to hunting land on a 3-point rating scale (great, good, poor). Participants were then asked to rate the accessibility of the previously measured habitat types, unipolar scale 1 (habitat present but not accessible)—10 (habitat present and completely accessible). Next, participants were

asked to rate their belief that access three general hunting lands are in decline—sage, desert, private agriculture lands—on a bipolar scale of 1 (definitely true)–5 (definitely false).

The next section asked participants to rate the importance of conservation policy issues at the (a) federal government level and (b) state/provincial government level, unipolar scale of 1 (appropriately prioritized)–10 (critically under-prioritized). Federal-level items were: conservation of raptor species of concern, conservation of the Greater Sage Grouse, conservation of the Lesser Prairie Chicken, conservation of waterfowl, management of mineral and/or energy development, management of contaminants, management of climate change, management of invasive species, management of poaching and/or illegal trade in wildlife, funding for state, funding for conservation in the Farm Bill. State- and provincial-level items were: conservation of state-listed/species of concern raptor species, conservation of small mammal game species, conservation of upland bird species, conservation of key raptor prey species, management of mineral and/or energy development, management of residential development, management of contaminants, management of poaching and/or illegal trade in wildlife, management of climate change, management of invasive species, funding for your state agency, funding for conservation in the Farm Bill, private land access, state land access.

Falconer type was measured as longwinger, austringer, or both (longwingers fly falcons like gyrfalcon [*Falco rusticolus*] or peregrine [*Falco peregrinus*]; austringers fly goshawks [*Accipiter gentilis*] or broadwing hawks like red-tailed [*Buteo jamaicensis*] and Harris's hawks [*Parabuteo unicinctus*]). Participants' geographical information was measured via two measures: 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

sociodemographic measures were measured as categorical variables: age (19-24, 25-33, 34-42, 43-49, 50-54, 55-62, >63) and gender (female, male, other). Other sociodemographic measures were not measured (i.e., ethnicity, education, income).

Results

Participants were primarily male (84.4%) and aged 55+ (65.9%). Most participants were US-based (88.7%), with a regional bias towards states in the mountain (23.0%), central (18.2%), and southeast (16.6%) (Table 1). Participants were primarily austringers (40.4%) or both (38.4%), exclusive longwingers were 21.2% of responses. The pattern of self-identified austringer or both followed in most regions but reversed in the mountain region (Table 2).

A large majority of participants define conservation as the management of both habitat and species (90.1%), while 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 non-native game birds (4.94 ± 2.88). Statistically significant differences among participants' ratings of importance were observed, based on Kendall's coefficient of concordance ($W = .35$, $\chi^2_4 = 604.15$, $P < .001$). Post-hoc comparisons (Dunn's test) observed statistically significant differences between all wildlife populations except raptors and small game mammals ($\chi^2 = -2.71$, $P = .67$). Comparisons across austringer and longwinger falconer type revealed no differences between wildlife populations except raptors ($t_{235} = 3.26$, $P < .001$, 95% CI = .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.

In terms of general prey groups, result indicate that participants believe grouse ($1.57 \pm .71$), rabbit ($.19 \pm 1.05$), and duck ($2.55 \pm .99$) 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 ranked 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, lagomorph, and rodent prey populations (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 ($W = .22$, $\chi^2_8 = 664.05$, $P < .001$). 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 ($1.37 \pm .64$) are believed to be experiencing the most decline, followed by wetlands ($1.60 \pm .82$), small ponds ($1.88 \pm .97$), and forests ($1.95 \pm .98$) (Table 4).

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 ($2.07 \pm .64$) 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 ($W = .06$, $\chi^2_{10} =$

189.07, $P < .001$). Post-hoc comparison by region followed a trend of the habitat's general presence in the region.

In terms of conservation policy issues at the federal level, participants ranked all issues above the mid-point of the 10-point response scale ($\bar{x} = 6.53$). Based on mean, 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). Similarly, at the state/provincial level, participants ranked all issues above the mid-point of the 10-point response scale ($\bar{x} = 6.21$). Based on mean, 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 associated with conservation policies ratings were observed.

Discussion

To provide an exploratory assessment of North American falconers' views on conservation issues relevant to the sport of falconry, this study sampled NAFA members to ask various questions about wildlife habitat, quarry species, land access, and conservation policy. In general, results suggest North American falconers believe the idea of conservation encompasses both habitat and species. This belief is reflected in the highest-rated conservation issues—contaminants, sage grouse, prairie chicken, and invasive species—reflecting interactions between species, habitat, and human activity on multiple scales. Yet, results paint a picture of NAFA members being concerned with habitat, first and foremost, followed by species conservation. But this concern focuses on native game birds, waterfowl, and small game mammals prey species conservation rather than raptors, which may seem counterintuitive. In relation to both the most important conservation issues and prioritization of habitat, the prominence of prairies, sagebrush, and wetlands are concomitant with regional differences and

concern for prey species. That is, as a hunting sport, quarry (and by association habitat) is of utmost importance as it forms the crux of the relationship and experience falconers seek with their chosen wild raptor (McGough 2019). Results also reveal notable differences based on either region or falconry practice that provides considerable insight for a member-based conservation organization like NAFA that operates continent-wide.

NAFA members appear to appreciate a connection between prey and habitat (Thomas et al. 2016). This is an important finding; a focus solely on prey would indicate a need to inform the membership on the importance of habitat quality and quantity of prey densities. Instead, conservationist can directly engage with the membership to discuss and develop NAFA initiatives for habitat and ecosystems management (Jenkins 2003). Interestingly, prey conservation is of greater concern than raptor conservation. One could assume NAFA members prefer conservation efforts that are raptor-focused but instead prefer to conserve raptors via an indirect route of prey- and habitat-focused conservation. That is, grouse, lagomorph, 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, this shift to a prey-centric viewpoint broadens an organization's conservation perspective as that focus 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, secondary, and tertiary consumers.

NAFA members seem also to be aware of the unprecedented loss of prairie, sage, and wetland habitat. Prairie landscapes, like those that intersperse the North American 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. el. 2019). The Great Plains have experienced extensive conversion of grassland to agriculture, whereas temperate grassland biomes have suffered greater species "loss" than any other North American biome (Forrest et al. 2004, Laliberte and Ripple 2004, Drummond and Auch 2016). Interestingly, there was no regional difference related

to the belief that prairie habitat is in decline, whereas other habitats did have regional differences; prairie habitat was consistently of high concern among participants. This suggests the importance of prairie habitat to members but also that, perhaps, the NAFA membership is well-informed of prairie habitat loss. This concern could also be a construct of most participating members residing in a NAFA region that has considerable prairie or remnant prairie habitat, i.e. the Great Lakes, Central, and Mountain regions. In either case, it is potentially indicative of an overarching conservation concern among the membership that can direct the organization's conservation outreach and programmatic development (Adams et al. 1997).

In terms of other habitat concerns, 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 organizations like NAFA, which is volunteer-based and operates on a minimal 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 raptor species capable of hunting that quarry, and accessibility. As such, the identification of prairie habitat as a seemingly consensus concern is an exemplar of the benefit provided by membership monitoring and evaluation. With that consensus concern identified, a NGO like NAFA can begin to develop strategic conservation programming, partnerships, and investment plans.

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 U.S. (e.g., 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 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 sociodemographics, while the largest proportion of participants were males over the age of 55, it is representative of NAFA as an organization but also aligns with trends in the US general hunter population (U.S. Fish and Wildlife Service and U.S. 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 a skewed age structure distribution. However, it should be noted that regulations, financial costs, and time commitments associated with entering falconry disproportionality act as barriers to younger populations.

Potential conflict between falconer types was an a priori concern. The only observed difference between the two practices, austringer and longwinger, was the importance of raptor conservation. This may be a result of each groups preferred raptor’s historic and current protection status. Longwingers, who rated raptor conservation as less important, fly falcons, primarily the peregrine. This species was previously listed as federally endangered, and though delisted, is well-protected at the state and international level. Conversely, austringers may not view accipiters or broadwings as having had or having the same protections afforded to longwings. For example, the red-tailed hawk (*Buteo jamaicensis*) or goshawk (*Accipiter gentilis*), two common raptors across North America and within falconry, have been historically persecuted and receive limited protection (Bildstein 2008). These divergent histories and

protection statuses offer a likely explanation; however, there may be others reasons the survey was unable to detect that further explain this difference.

Implications for Big Tent Bird Conservation

A broad conservation coalition is an imperative to success (Beier et al. 2017). A big tent conservation mindset encourages a plurality of views among members. Based on these exploratory results, a multitude of perspectives exist within NAFA such that its conservation orientation cannot be singular and must be adaptive and responsive to the membership. While such heterogeneity has its drawbacks, for NGCOs like NAFA—with an esoteric entrée to membership but continental-wide operations—that heterogeneity should be viewed as an opportunity to synergize its initiatives with appropriate partners. Given observed preferences for prairie habitat and grouse species, this could entail partnerships 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 Duck 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, The Nature Conservancy and a cattlemen's association in upland rangelands, or a timber corporation and family forest owners in the forest-dominant regions. While central governance is necessary, some polycentricity with semi-autonomous regional initiatives and partnerships may facilitate NAFA's big tent aspirations among various and differentially oriented bird conservation organizations (Hine 1977).

Limitations and Future Research

As established quantitative survey research methods were used, limitation 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 questionnaire design or question wording is also worth noting. For example, it should be noted that 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. 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 2019).

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 a simple, systematic investigation can reveal important areas 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 lagomorphs, 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 initiative, given the broad array of members' concerns, under a big tent of bird conservation.

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Tables

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 (<i>n</i> = 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 (<i>n</i> = 437)	Male	369	84.4
	Female	66	15.1
	Other	2	.5
Falconer type (<i>n</i> = 391)	Austringer	158	40.4
	Longwinger	83	21.2
	Both	150	38.4
Region (<i>n</i> = 439)	Mountain (US)	101	23.0
	Central (incl. 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

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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

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

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

^aRating scale is 1 not important – 10 extremely important.^bStatistically significant difference at the $P < 0.001$ level.

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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 ($n = 391$).

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

^aRating scale is 1 not important – 10 extremely important.

^bComposite of short grass prairie and tall grass prairie items.

^cComposite of deciduous forest, temperate conifer forest, and boreal forest items.

^dComposite of sagebrush/shrub-steppe (high desert) and desert/mesic shrub (low desert) items.

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