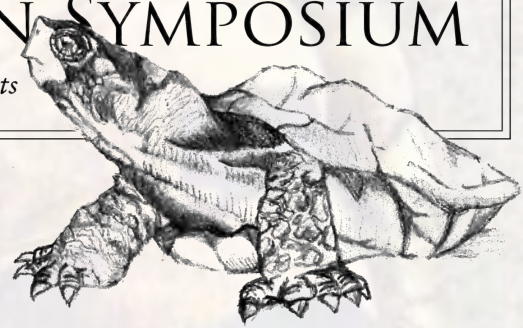




Blanding's & Wood Turtle
CONSERVATION SYMPOSIUM

October 2016 • Westborough, Massachusetts



Post-Symposium Survey Report



Table of Contents

Symposium Synopsis...	3
Survey Overview...	4
Wood Turtle Threats and Needed Conservation Actions...	5
Blanding's Turtle Threats and Needed Conservation Actions...	8
Actions needed to achieve conservation objectives...	11

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Symposium Synopsis

On October 3, 2016, 101 turtle conservationists from 58 institutions across the eastern half of the United States and Canada convened at the Massachusetts Division of Fisheries and Wildlife headquarters in Westborough, MA for the first Blanding's and Wood Turtle Conservation Symposium. This event provided a valuable opportunity for Blanding's (*Emydoidea blandingii*) and Wood (*Glyptemys insculpta*) turtle experts to build partnerships and share knowledge—an experience that may lead to a more cohesive approach to the range-wide conservation of these two at-risk species.

Each of two days was devoted to a single species, and broad themes for presentations covered topics such as regional coordination efforts (in the Midwest/Great Lakes, Northeast, and Canada), population assessment techniques, law enforcement, management, and genetics. The first day was topped off with an inspiring keynote address by Dr. Justin Congdon from the Savannah River Ecology Laboratory. In total, 44 speakers made presentations.

In addition to presentations, breakout sessions scheduled throughout each day provided an informal forum for attendees to brainstorm methods for tackling pertinent challenges to the conservation of these species. Discussion topics included the potential for inter-region collaboration, methods to effectively counter poaching and black market pressure on wild populations, genetics considerations in turtle conservation, prioritized land conservation, habitat management, and population management.

We hope and anticipate that this conference will lead to renewed coordination within and between management regions, improved conservation and management efforts at priority sites, and informed conservation planning for related species such as the Spotted Turtle (*Clemmys guttata*).

In an effort to gauge the professional opinion and judgment of the Blanding's and Wood Turtle conservation communities, an electronic survey was provided to all attendees as well as those who were unable to attend. The objectives of this survey were to (1) rank the relative urgency of threats facing Blanding's and Wood Turtles, (2) identify and prioritize the actions needed to maintain viable populations of these species, and (3) identify and prioritize actions that will further efforts for inter-regional coordination, the compilation of data, education, and the combating of poaching and trafficking. This document contains a summary of the survey results.



Attendees pose for a group photograph at the 2016 Blanding's and Wood Turtle Conservation Symposium.

Survey Overview

General information

A total of 82 experts from 20 states and Canadian provinces participated in the survey. The average number of years that respondents had worked with Blanding's Turtles and Wood Turtles were 11.4 and 10.5, respectively. Roughly 43% of survey participants did not attend the symposium.

Overall, there was strong support for the symposium as well as the prospect of a follow-up symposium in the coming years. Sixty-five percent of respondents were in favor of another symposium in 2018 and roughly 51% felt that the next symposium should include Spotted Turtle as a focal species, considering the high level of regional coordination for this species and a large amount of overlap in taxonomic experts. Twenty-seven percent of survey participants indicated that Bog and Box Turtle should be considered for inclusion in another symposium; however, a common opinion among respondents was that including more species may dilute the overall effectiveness of the symposium. Bog Turtles are strongly regulated by existing federal and state jurisdictions and thus priority conservation actions and tools available are quite different than other Emydine species; Box Turtles have a comparatively large geographic range and taxing variability/uncertainty.

For each species, respondents were asked to rank threats to that species on a scale of 0 (no threat) to 5 (highest threat) at both the range-wide and local level. Respondents were also given the open-ended opportunity to identify specific threats. Similarly, respondents were asked to prioritize the importance of actions for maintaining viable populations of each species (from 0 [unimportant action] to 5 [very important action]). Finally, respondents were asked to prioritize (on a scale of 0 = lowest to 5 = highest priority) specific next steps for inter-regional coordination, compiling information and data, education, and poaching and trafficking.

Regions

Both Blanding's and Wood Turtle ranges span large portions of eastern North America across differing landscapes with varying anthropogenic pressures. Because of this, we have chosen to examine a portion of the survey results by geographic region in addition to overall trends. We have divided respondents into three regions: U.S. Fish and Wildlife Service (USFWS) and Association of Fish and Wildlife Agencies (AFWA)'s Northeast Region, USFWS/AFWA Midwest Region, and Canada (Table 1).

Table 1. Summary of regions used to examine how survey responses varied throughout each species' range. Northeast and Midwest correspond to U.S. Fish and Wildlife Service (USFWS) and Association of Fish and Wildlife Agencies (AFWA) regions.

	Northeast, USA	Midwest, USA	Canada
States/provinces represented	ME, NH, MA, CT, NY, NJ, PA, MD, VA, WV	OH, IL, WI, MN, MI	ON, QC, NB, NS
# of respondents	43	23	16

Wood Turtle Survey Results

Overall perception of threats.— Results indicate that survey respondents perceive ongoing and additional **habitat loss and degradation** to be the foremost threat to Wood Turtles at both the local and range-wide scales, followed by **elevated anthropogenic mortality** (excluding collection) (Fig. 1). Relative importance among threats was more or less consistent between spatial scales (i.e., local vs. range; this was the case throughout the survey). The notable exception to this pattern was **poaching**, which shifted from fourth in importance at the local scale to third at the range scale—indicating that while conservationists view poaching as a relatively important threat overall, it is perceived to be a considerably greater threat elsewhere than their region of expertise. Climate change and genetic isolation/inbreeding were viewed as the lowest threat to Wood Turtles, but this should be interpreted with the knowledge that these categories ranked the highest in uncertainty, with 40–48% of participants reporting an unknown threat level at both scales (Table 2).

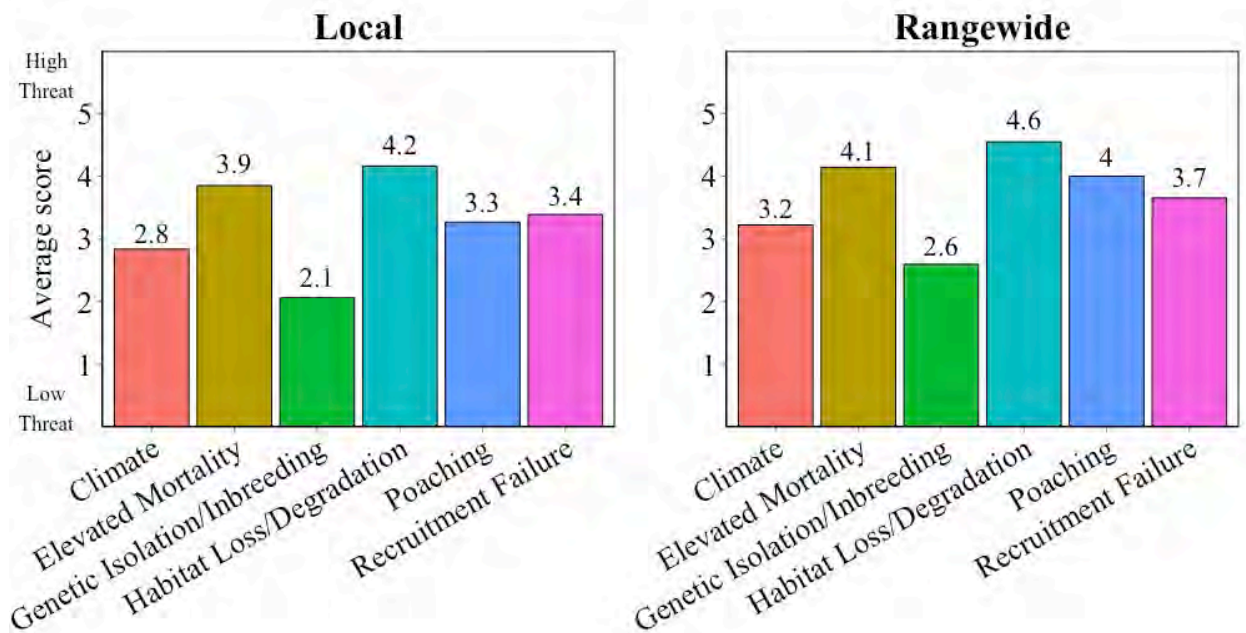


Figure 1. Relative importance of threats to Wood Turtles at local (study area of the respondent) and range-wide scales.

Table 2. Percent of respondents that reported an unknown threat level for each of 6 potential threats to Wood Turtles at both local (study area of the respondent) and range-wide scales.

Scale	Climate	Elevated Mortality	Genetic Isolation/Inbreeding	Habitat Loss/Degradation	Poaching	Recruitment Failure
Local	0.43	0.04	0.41	0.07	0.25	0.17
Range-wide	0.4	0.13	0.48	0.07	0.21	0.27

Regional perceptions of threats.— Binning perceptions of threats by region of expertise shows that overall, throughout the range, most threats are viewed with the same relative degree of importance, regardless of region (Fig. 2). One clear exception is recruitment failure, which appears to be considered a greater threat in midwestern states than the rest of the species range.

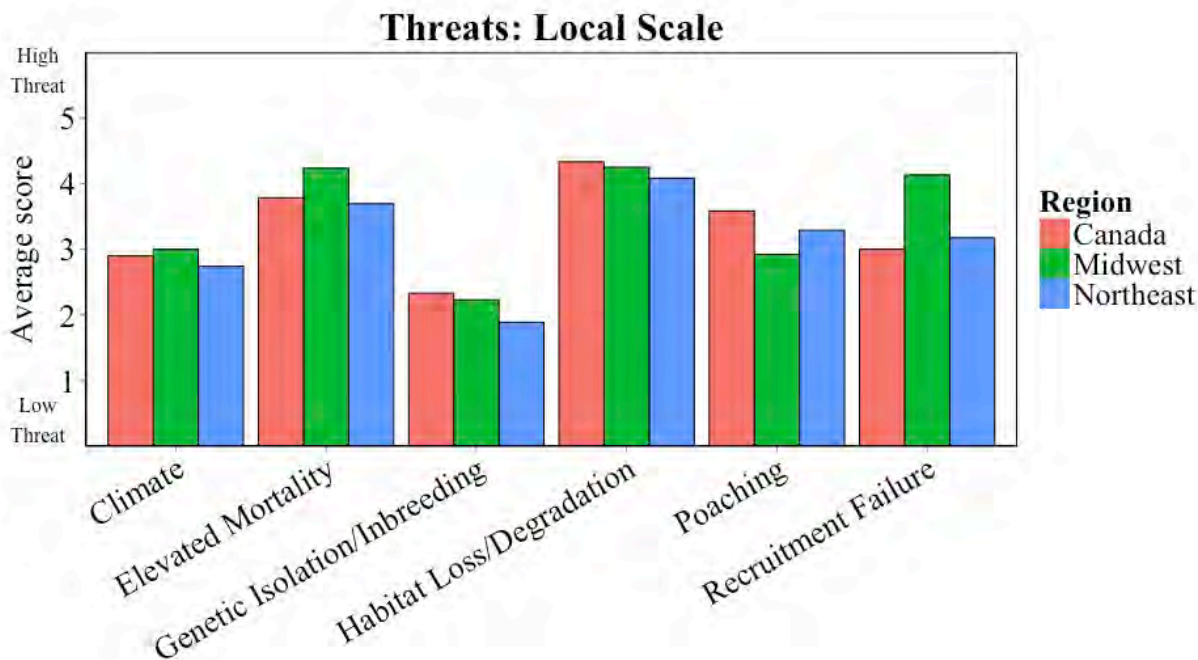


Figure 2. Relative importance of threats to Wood Turtles at the local (study area of the respondent) scale separated by region.

Specific threats highlighted by respondents.— When asked to list specific threats within or in addition to the broad categories described above, respondents identified the following: forestry operations, aggregate extraction, regulatory incompetence, meso-predators, river flow alterations, nesting habitat loss, and agriculture.

Conservation actions needed.— Overall, **land protection** was viewed as the most important action needed to support the persistence of Wood Turtle populations, regardless of scale (Fig. 3). This is consistent with the general perception that habitat loss is the greatest threat to Wood Turtle populations throughout the range. **Technical assistance** (to key landowners) ranked as the second most important action, followed by **riparian restoration**. Notably, repatriation/reintroduction and headstarting were ranked as considerably lower priorities at both scales, indicating a prevailing opinion that—except in extreme cases—stopgap measures to boost recruitment may distract from other conservation measures with more permanent effects. Clearly, however, population management may be a necessary component to preserve imperiled unique lineages and boost recruitment as management challenges are addressed.

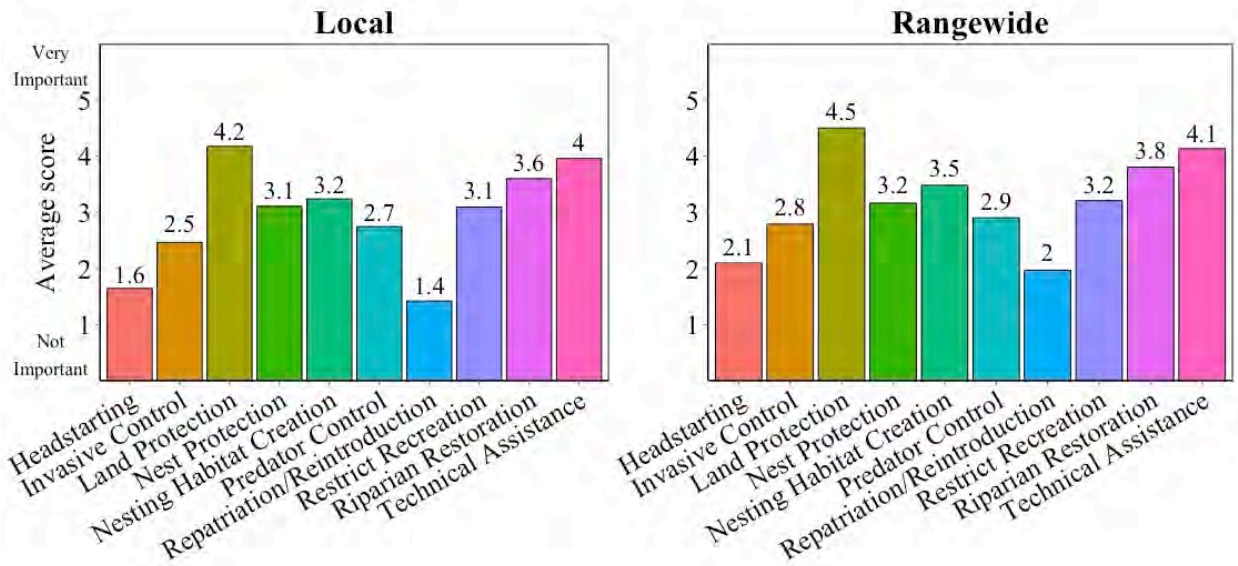


Figure 3. Relative importance of actions needed to maintain viable Wood Turtle populations at local (study area of the respondent) and range-wide scales.

Conservation actions needed by region.— Views of the importance of conservation actions varied considerably among regions (Fig. 4). Northeastern and Canadian respondents viewed land protection as the most important action needed while midwestern respondents ranked nesting habitat creation and nest protection as most important. Nest-related actions (protection and habitat creation) and predator control were considered greater priorities in the Midwest than the rest of the range. Though consistently ranked lower than the other actions, northeastern states appear to view headstarting and repatriation/reintroduction as lower priorities than the remainder of the range.

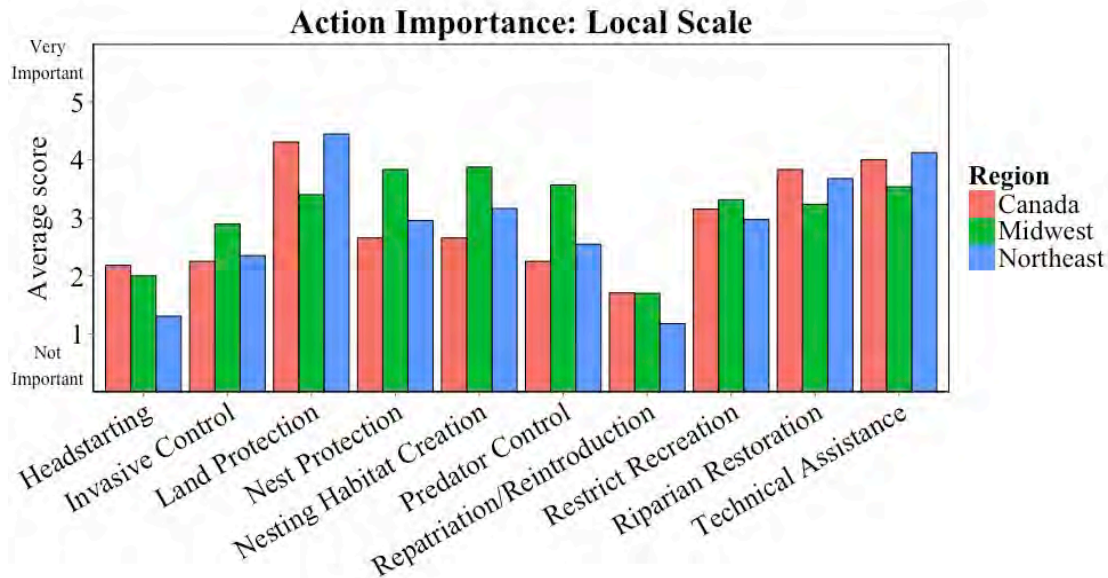


Figure 4. Relative importance of actions needed to maintain viable Wood Turtle populations at the local (study area of the respondent) scale separated by region.

Blanding's Turtle Survey Results

Overall perception of threats.— Among the threats to Blanding's turtles considered, there was a clear division in perceived importance, with **habitat loss**, **elevated mortality**, and to a lesser degree, **recruitment failure**, seen as considerably greater threats than climate change, genetic isolation/inbreeding, and poaching (Fig. 5). In comparing the two species, poaching appears to be of greater concern for Wood Turtles than Blanding's Turtles. Similarly to Wood Turtle, climate change and genetic isolation/inbreeding were the two categories that respondents were the most uncertain about (Table 3).

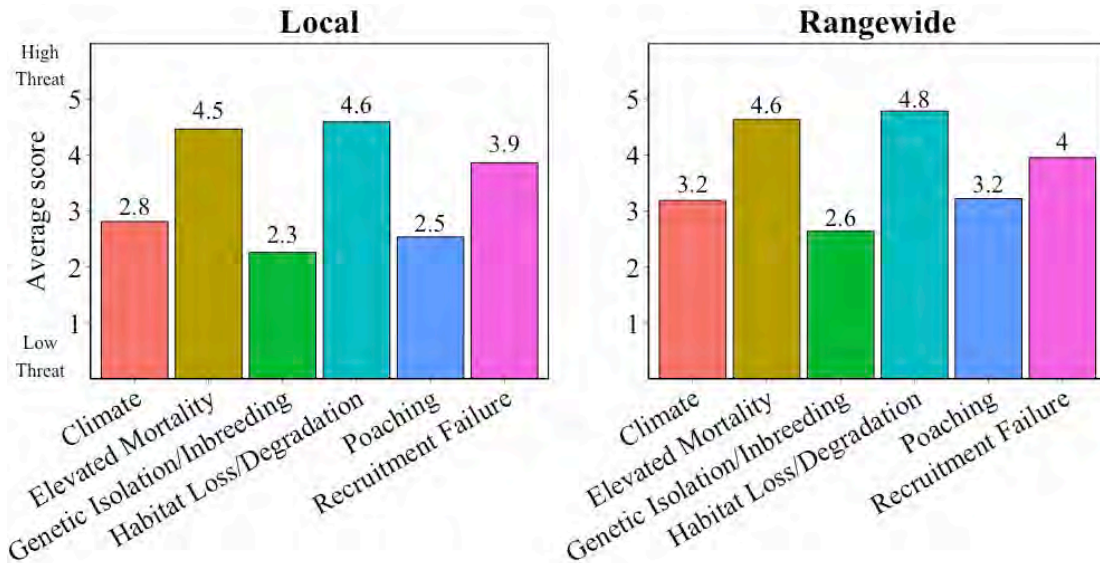


Figure 5. Relative importance of threats to Blanding's Turtles at local (study area of the respondent) and range-wide scales.

Regional perceptions of threats.— Survey respondents from northeastern states and Canada viewed habitat loss as the most important threat to Blanding's Turtles, while elevated mortality was most important in the Midwest (Fig. 6). The Northeast and Midwest appear to view recruitment failure as a greater threat than Canada does.

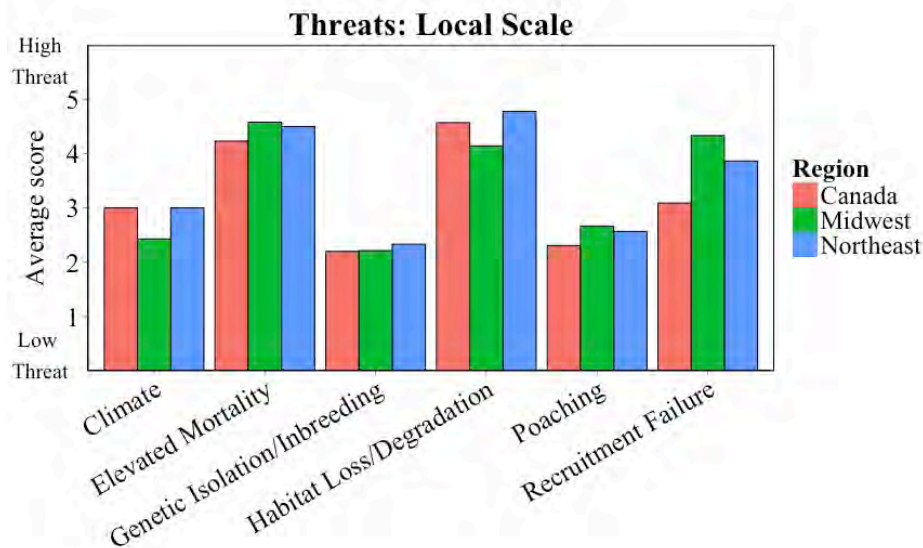


Figure 6. Relative importance of threats to Blanding's Turtles at the local (study area of the respondent) scale separated by region.

Table 3. Percent of respondents that reported an unknown threat level for each of 6 potential threats to Blanding's Turtles at both local (study area of the respondent) and range-wide scales.

Scale	Climate	Elevated Mortality	Genetic Isolation/ Inbreeding	Habitat Loss/ Degradation	Poaching	Recruitment Failure
Local	0.35	0.04	0.36	0.04	0.07	0.14
Range-wide	0.43	0.08	0.44	0.4	0.18	0.18

Specific threats highlighted by respondents.— Lack of viable population size, road mortality, regulatory incompetence, meso-predators, habitat alteration (fragmentation, isolation, lack of protection), insufficient nesting habitat were identified as specific additional threats.

Conservation actions needed.— **Land protection** was the clear favored action for maintaining viable Blanding's Turtle Populations (Fig. 7). This was followed by **technical assistance**, **nesting habitat creation**, and **wetland restoration**. As with Wood turtles, repatriation/reintroduction was viewed as the lowest priority with respect to all actions considered.

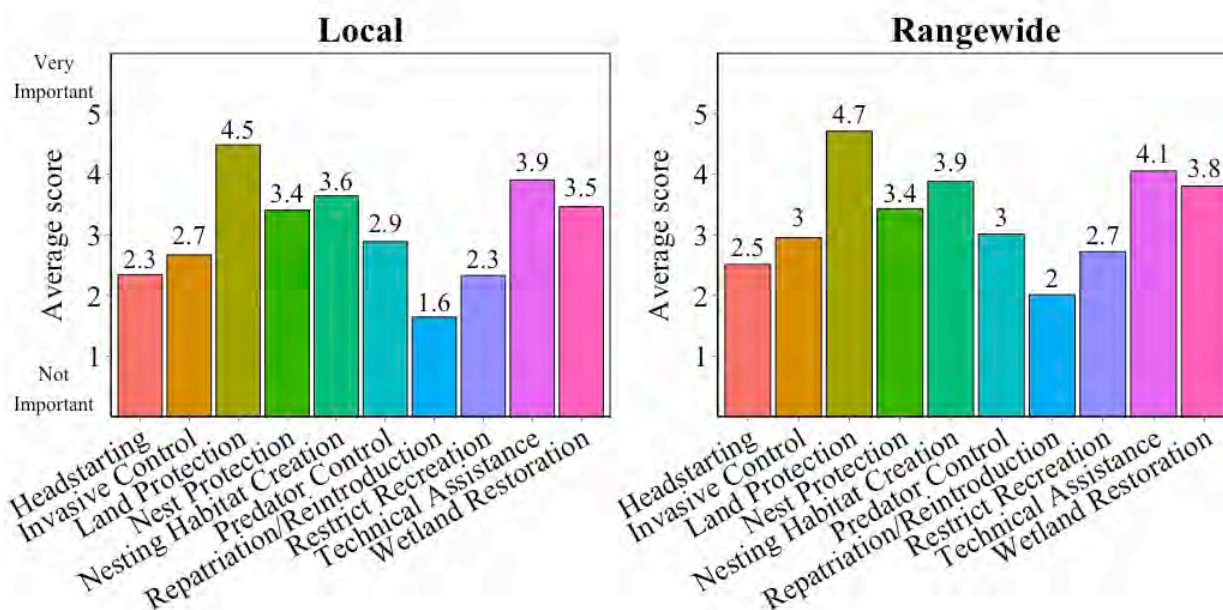


Figure 7. Relative importance of actions needed to maintain viable Blanding's Turtle populations at local (study area of the respondent) and range-wide scales.

Conservation actions needed by region.— In contrast to responses for Wood Turtle, all regions ranked land protection as the most important action needed to maintain viable Blanding's Turtle populations (Fig. 8). Predator control appears to be a considerably higher priority in Midwest.

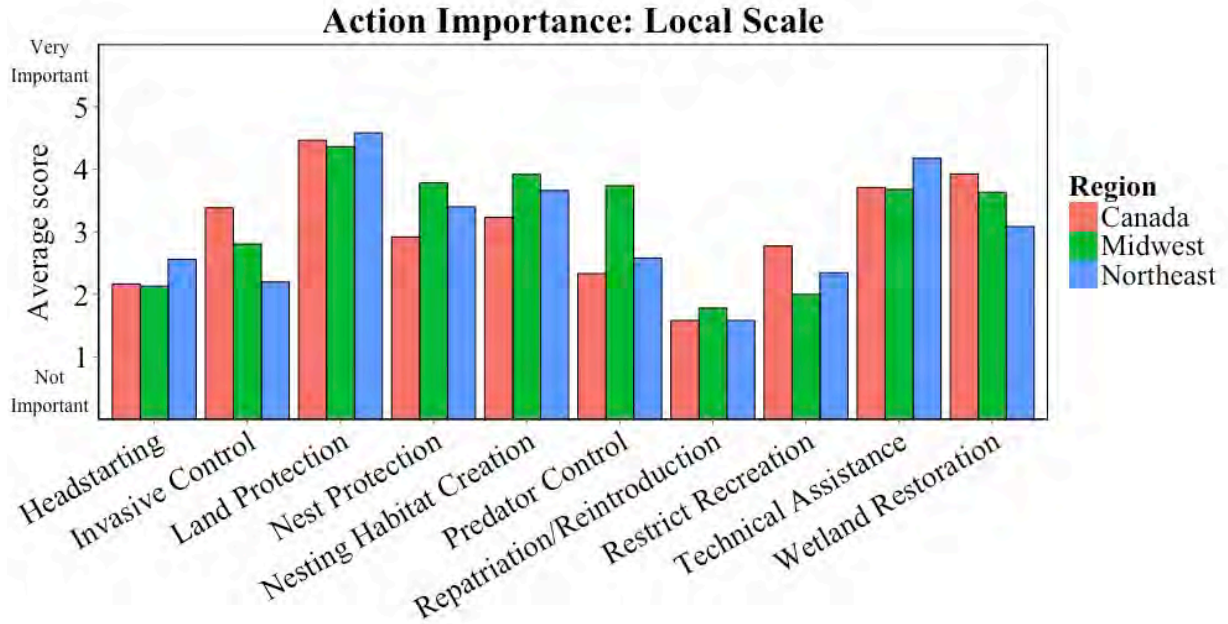


Figure 8. Relative importance of actions needed to maintain viable Blanding's Turtle populations at the local (study area of the respondent) scale separated by region.

Actions Needed to Achieve Conservation Objectives

In reflecting upon the steps that need to be taken in order to more effectively conserve both Blanding's and Wood Turtles, four broad objectives were identified: (1) greater inter-regional coordination, (2) the compilation of information and data for range-wide use, (3) education, and (4) combating poaching and trafficking. Actions for best achieving these objectives were brainstormed and survey respondents were asked to score their relative importance.

Greater Inter-Regional Coordination.— Although overall, survey respondents felt that **range-wide species status assessments** and a general effort to increase **range-wide coordination of efforts** to conserve these species would be most beneficial for achieving this objective, there were several actions that competed for the most important objective including a **list-serv for sharing information** as well as a range-wide **standardized monitoring protocol** (Fig. 9).

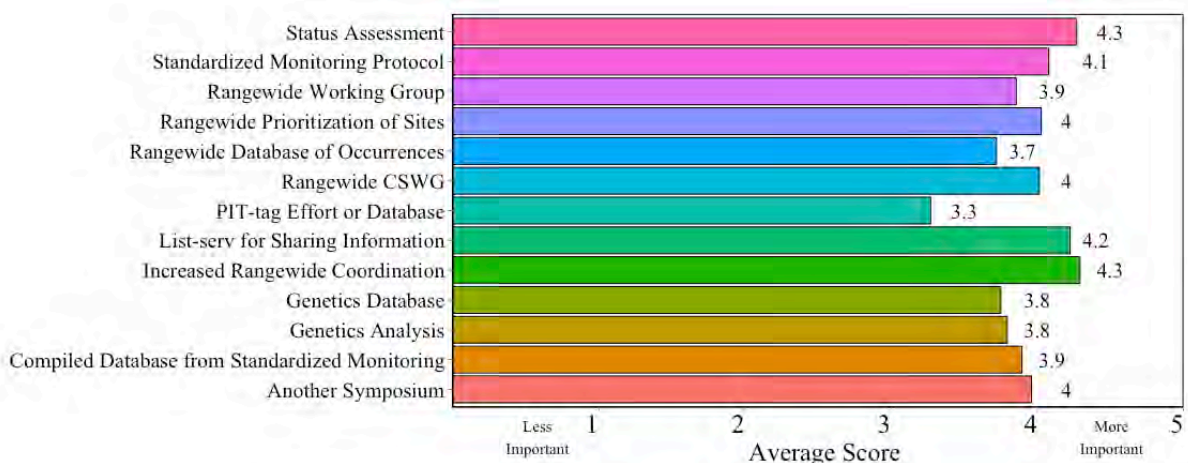


Figure 9. Relative importance of actions needed to achieve greater inter-regional coordination for Blanding's and Wood Turtles.

Compilation of Information and Data.— The gathering of **technical assistance materials for the creation of range-wide habitat management guidelines** was viewed as the most important use of time with regard to compilation information and data throughout the range (Fig. 10).

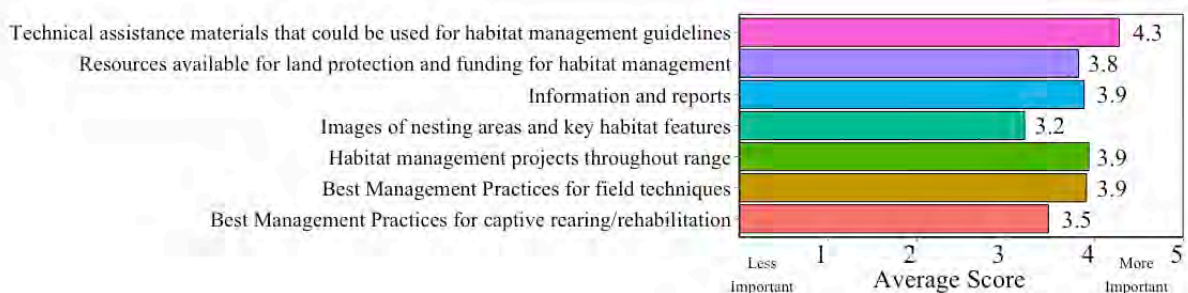


Figure 10. Relative importance of information/data that could be compiled for both Blanding's and Wood Turtles.

Education.— Two clear actions stand out as the most effective with regard to education of turtle conservation issues: **outreach to landtrusts and land purchasing/holding agencies** and **increased outreach to Departments of Transportation** (local AND state; to mitigate known and potential sources of road mortality) (Fig. 11).

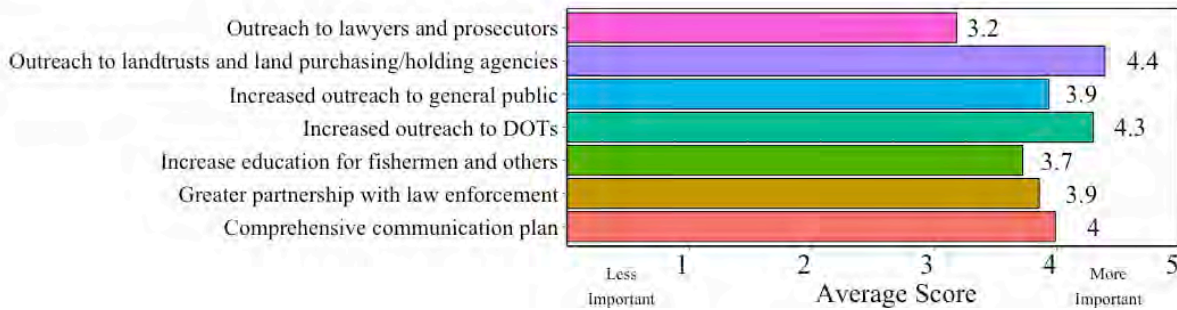


Figure 11. Relative importance of actions needed to improve education for both Blanding's and Wood Turtles.

Combating Poaching and Trafficking.— Among actions considered for combating poaching and trafficking, **advocating for stricter enforcement of existing laws** sticks out as the most important (Fig. 12). This appears to reflect a general agreement that the current legislation and regulations are not utilized to the fullest degree. It is likely that this will require an increased response at the federal level.

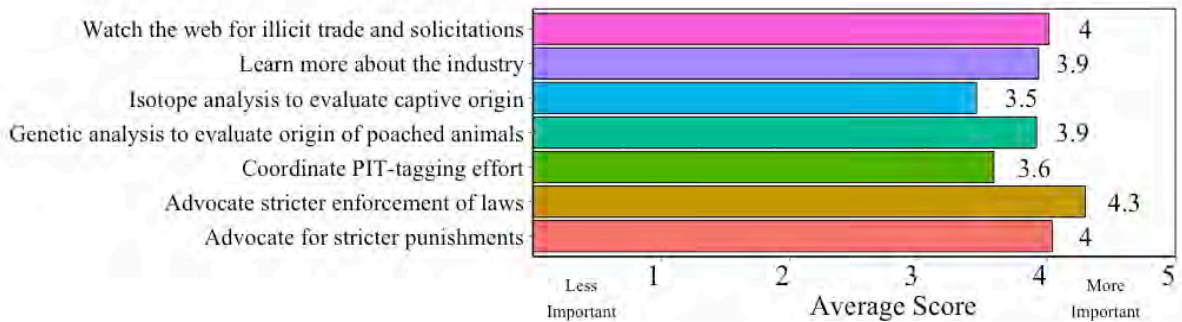


Figure 12. Relative importance of actions needed to better combat poaching of both Blanding's and Wood Turtles.