



NATIONAL
WILDLIFE
RESEARCH
CENTER

2011 RESEARCH NEEDS ASSESSMENT



USDA-APHIS-WILDLIFE SERVICES

2011 RESEARCH NEEDS ASSESSMENT



USDA/APHIS/WILDLIFE SERVICES
NATIONAL WILDLIFE RESEARCH CENTER
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EXECUTIVE SUMMARY

The National Wildlife Research Center (NWRC) does not have the resources to address all the listed needs of the Wildlife Services program. Beginning in 1989, the Wildlife Services Management Team determined that a national research needs assessment (RNA) would be conducted every five years. Identified research needs are used by the NWRC Director as principle guidance for prioritization, along with Congressional Directives and Deputy Administrator guidance, in allocating NWRC resources to specific research projects that address the WS Program's priority research needs.

Invitations to participate in the 2011 survey were sent to the directors of the Eastern Region, Western Region, NWRC, and Operational Support Staff as well as to the National Coordinators of the Rabies, Wildlife Disease, and Airport Wildlife Hazards programs. The directors and coordinators were asked to distribute the request throughout their organizations. A similar survey was distributed by the Association of Fish & Wildlife Agencies to Fish and Wildlife Chiefs throughout the US. These external responses were analyzed separately and are included following the internal WS survey.

Previous RNAs solicited the top three research needs of participants. The 2011 RNA incorporated this as the free-response section, but also included thirty-one multiple choice questions. This allows for a more accurate quantification of our customers' perceptions and needs.

In the free response section, respondents were asked to describe their expected top three research needs. Individual respondents' input was reviewed and categorized into a data matrix by broad problem area, research needed, and animal. The multiple choice questions were divided into four broad sections, asking respondents to rate (1) the likely importance of various human-wildlife conflicts during the next five years in terms of impact on production, economics, human health & safety, and/or property damage; (2) their likely involvement as a wildlife professional in various areas of human-wildlife conflicts during the next five years; (3) the likely level of need in their state or region over the next five years for research to develop, improve, and/or evaluate different methods, tools, or information; and (4) the likely importance of consultations and services offered by the NWRC to their job during the next five years.

General conclusions can be drawn from the internal WS survey responses. Invasive species, specifically feral swine, are one of the biggest concerns. Many people requested economic analyses and gave economic assessments a high priority. Non-lethal control methods were requested repeatedly. Genetics and reproductive control were much more important to Research than Operations. Livestock predation was a much bigger concern in the Western Region than the Eastern Region, especially as pertaining to cows and sheep. The Western Region professed a higher need for research into lethal predator control options like toxicants and shooting. Game animals were also considered more important in the Western Region. Cormorants, feral swine, and deer were animals that the Eastern Region rated of higher concern. Western respondents placed more importance on the services and consultations offered by the NWRC.

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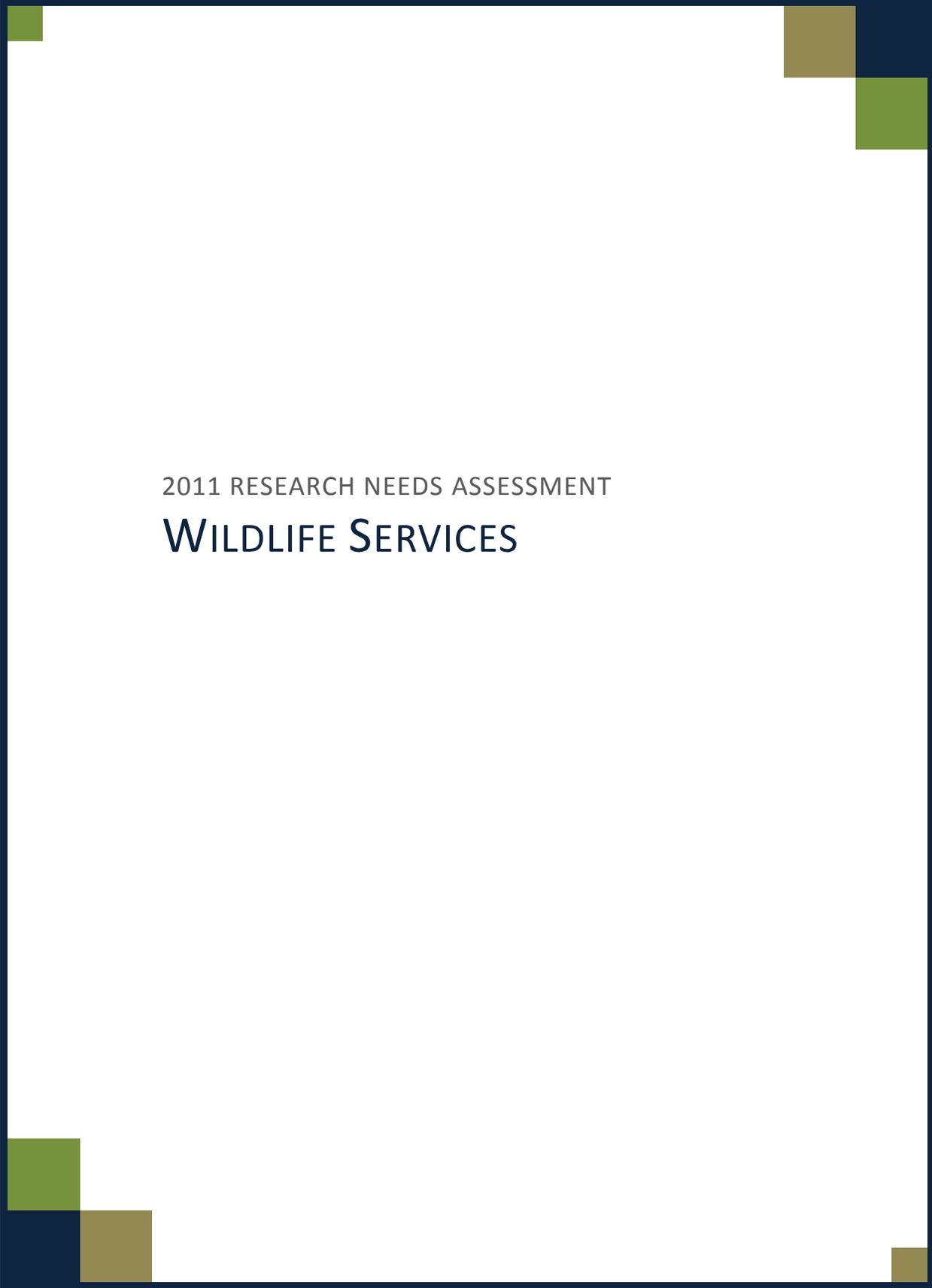
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2011 RESEARCH NEEDS ASSESSMENT
WILDLIFE SERVICES

BACKGROUND

The mission of USDA APHIS Wildlife Services (WS) is to provide Federal leadership and expertise to resolve wildlife conflicts to allow people and wildlife to coexist. In support to this mission, the WS National Wildlife Research Center (NWRC) applies scientific expertise to the development of practical methods to resolve these problems and to maintain the quality of the environments shared with wildlife (USDA, 2011).

Beginning in 1989, the WS Management Team determined that a national research needs assessment would be conducted every five years. For the first assessment, a survey of all WS State Directors resulted in a list of research needs and priorities based on species and affected resource groups (Packham and Connolly, 1992). In 1991, the WS Program convened an “Expert Panel” of stakeholders in science, industry, agriculture, and the environment in Denver, Colorado to identify research approaches to address the wildlife damage problems and needs identified in the 1989 survey. In 1996, 2001, and 2006, three additional WS program-wide Research Needs Assessments were completed (Bruggers et al., 2002; Clark et al., 2006). These Research Needs Assessments (RNA) guide the WS Methods Development research planning and have been used by the NWRC Director for guidance, along with Congressional Directives, Deputy Administrator input, input from external sources, and input from stakeholder groups, in allocating NWRC resources to specific research projects that address the WS Program’s priority research needs.

As part of the process to improve and strengthen its research and better align the research with WS Program and customer needs, the NWRC reorganized its research efforts in 1996 into individual multiyear, multidisciplinary projects. These research projects address specific areas related to research priorities identified by the RNA process. Projects are of three to five years duration and have clearly stated goals and objectives, projected milestones, expected outputs, periodic reviews, and annual progress updates (e.g. NWRC Annual Highlights Report and Annual Report of NWRC for Government Performance and Reporting Act).

Previous Research Needs Assessments solicited the top three research needs of participants. The 2011 RNA incorporated this as the free-response section, but also included thirty-one multiple choice questions. This allows for a more accurate quantification of our customers’ perceptions and needs.

In early March 2011, invitations to participate in the survey were sent to the directors of the Eastern Region, Western Region, NWRC, and Operational Support Staff as well as the National Coordinators of the Rabies, Wildlife Disease, and Airport Wildlife Hazards programs. The directors and coordinators were asked to distribute the request throughout their organizations. By May 2nd, 86 usable replies had been received.

The survey consisted of five demographic questions, a free-response section where respondents were asked to describe their top three research needs, and 31 multiple choice questions about human-wildlife conflicts and NWRC services. A copy of this survey can be found in Appendix A.

DEMOGRAPHICS

At the beginning of the survey, respondents were asked to answer five questions about their employment, geography, and age. Eight-six respondents participated in this section.

I am Employed by:

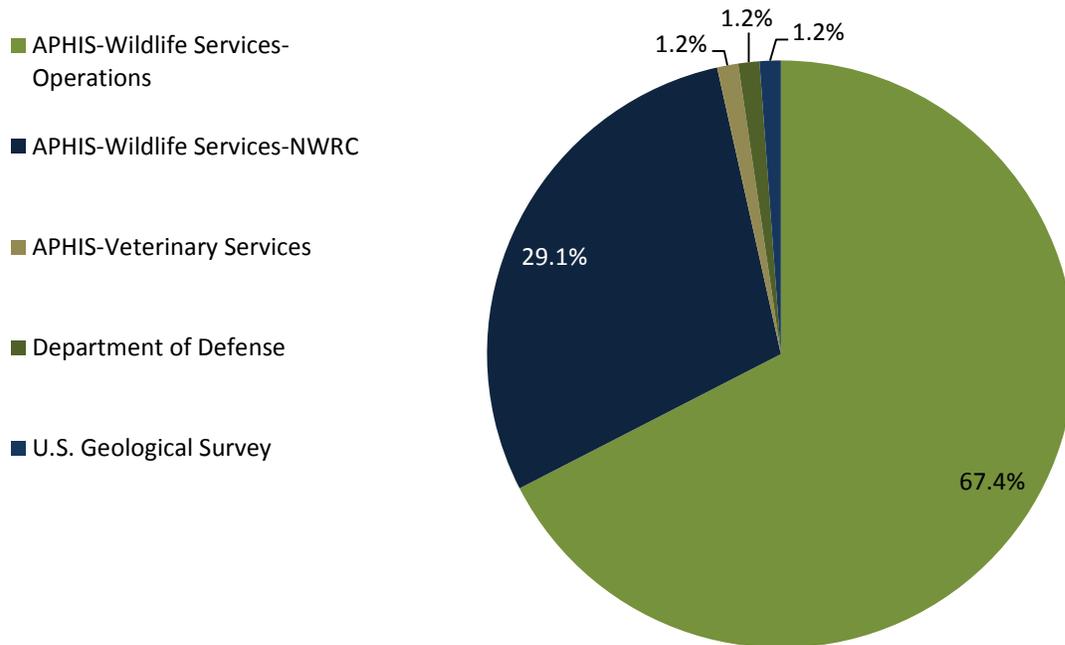


Figure 1: The employment distribution from the WS survey

The majority (67%) work for Wildlife Services- Operations. Of the respondents, 25 work at the National Wildlife Research Center. One reply each was received from Veterinary Services, the Department of Defense, and the U.S. Geological Survey. No replies were received from the Agricultural Research Service, Animal Care, Biotechnology Regulatory Services, Plant Protection and Quarantine, the Bureau of Land Management, the National Oceanic and Atmospheric Administration, the National Park Service, or the U.S. Fish and Wildlife Service.

Which of the Following Best Describes Your Principal Job?

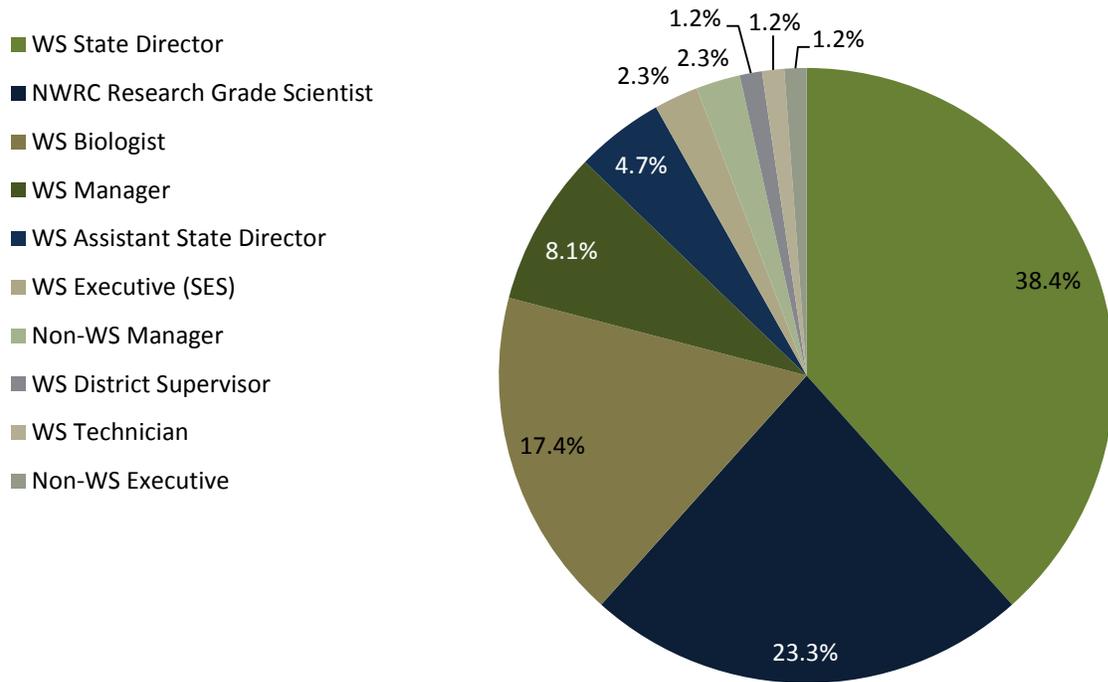


Figure 2: The job distribution from the WS survey

The most common job was Wildlife Services State Director, followed by National Wildlife Research Center Research Grade Scientist, then Wildlife Services Biologist. Of the respondents, 8 Wildlife Services Managers, 4 Wildlife Services Assistant State Directors, 2 Wildlife Services Executives, 2 Non-Wildlife Services Managers, 1 Wildlife Services District Supervisor, 1 Wildlife Services Technician, and 1 Non-Wildlife Services Executive also replied. No replies were received from Non-National Wildlife Research Center Research Grade Scientists, Non-Wildlife Services Biologists, and Non-Wildlife Services Technicians.

Geographic Data

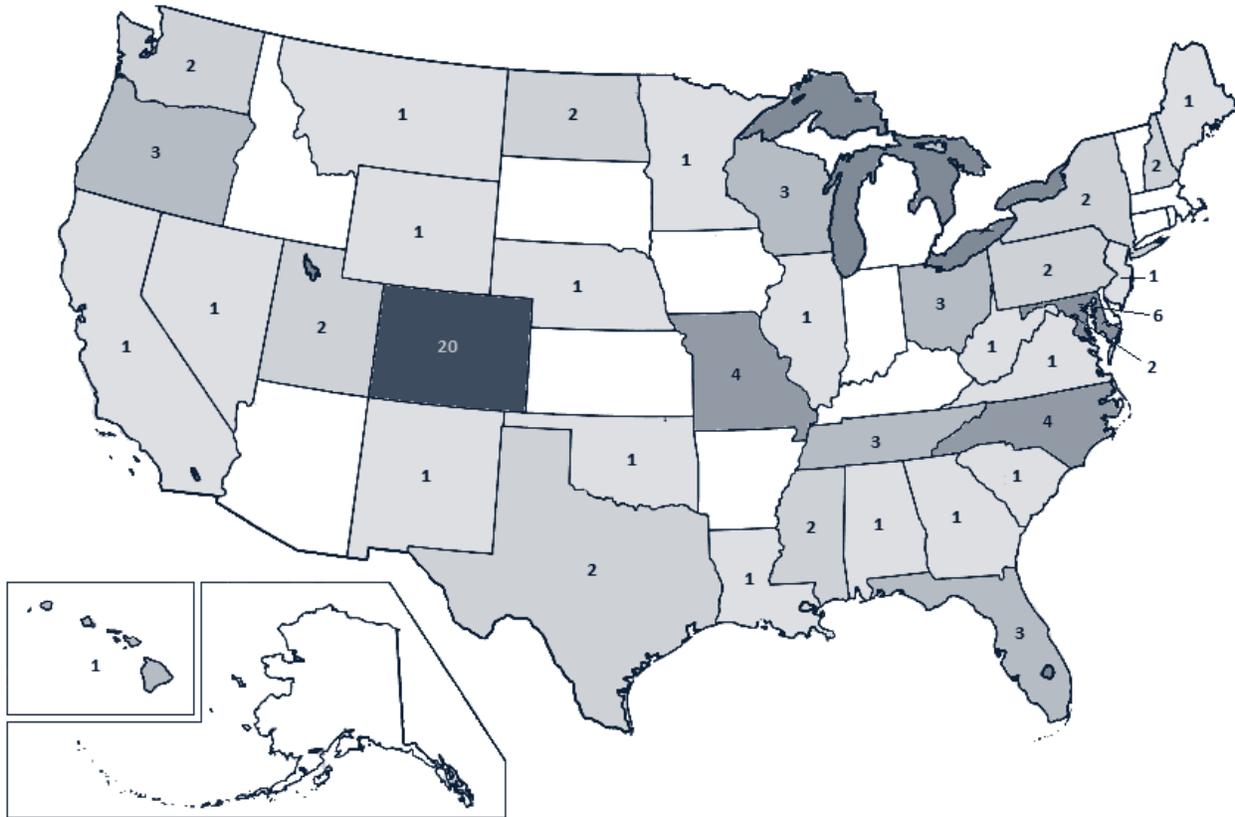


Figure 3: Map showing the number of surveys received from each state

Eighty-six respondents supplied their ZIP code. One of the given codes was invalid, consisting of only four digits. These ZIP codes were each correlated with a state. The most surveys were received from Colorado (20), followed by Maryland (6). At least one survey was received from every state except Alaska, Idaho, Arizona, South Dakota, Kansas, Arkansas, Michigan, Indiana, Kentucky, Delaware, Connecticut, Rhode Island, Massachusetts and Vermont. Two surveys were received from Washington DC.

Region

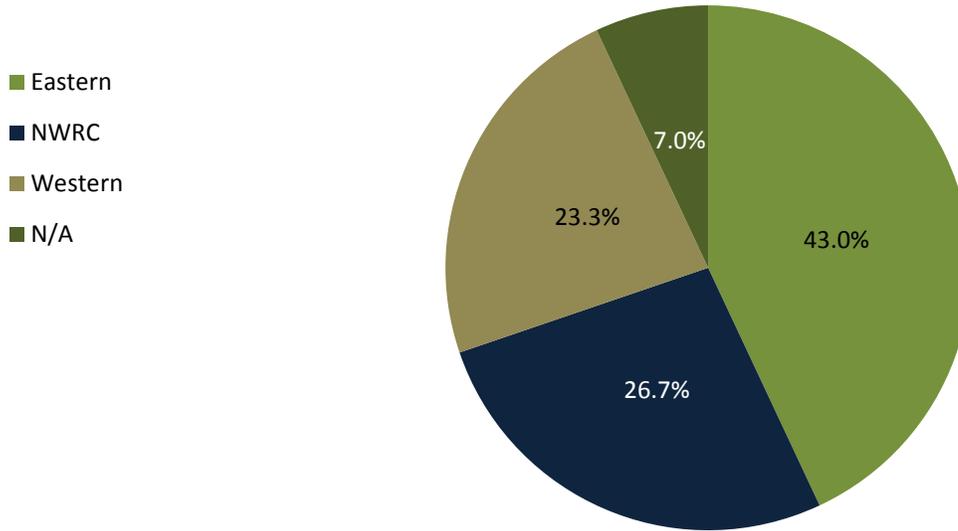


Figure 4: Regional distribution of WS survey respondents

Respondents were asked to indicate whether they were part of the Eastern Region, Western Region, or the NWRC. If they were not a part of Wildlife Services, they were told to choose N/A.

Age

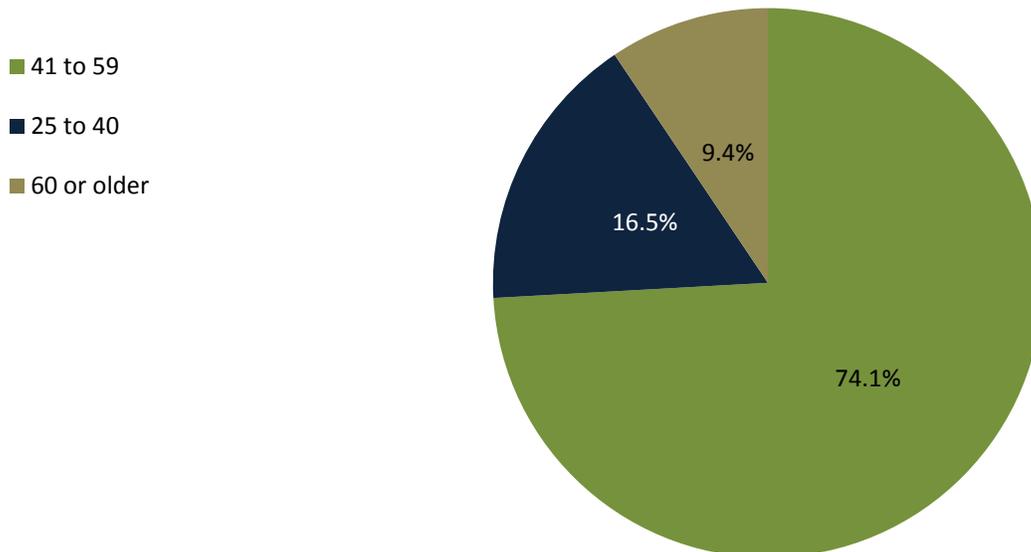


Figure 5: Age distribution of WS survey respondents

Respondents were asked to describe their age. The majority were between 41 and 59. No respondents were younger than 25.

TOP THREE RESEARCH NEEDS

Respondents were asked to describe their expected top three research needs over the next five years in their state or region. Each respondent could enter three research requests, but not all chose to do so. A total of 208 research requests were received from 76 survey participants. Individual respondents' input was reviewed and categorized into a data matrix. Data were categorized by broad problem area, research needed, and animal. Methodology from the 2006 Research Needs Assessment Report was used, but more categories were added to better describe the contents of the responses (Clark et al., 2006). The categories described below are not mutually exclusive, so replies were often labeled with more than one category.

Broad Problem Areas

- **Aquaculture Protection:** Anything involving the protection of aquacultures and fisheries, including protection from predation.
- **Aviation:** Anything involving airports or airplanes.
- **Crop Protection**
- **Dairies/Feedlots:** Anything having to do specifically with dairies or feedlots.
- **Disease-Livestock:** Disease issues involving livestock.
- **Disease-Rabies:** Issues involving rabies.
- **Disease-Zoonoses:** Issues involving zoonotic diseases.
- **Disease-Other:** All issues involving disease that did not fit in one of the other disease categories.
- **General:** Requests that were too general to classify as anything more specific. Examples include requests for economic analyses to justify programs and a request for more up-to-date statistics.
- **General Conflict:** Responses that request information, not damage management, about wildlife conflicts in general.
- **General Damage Management:** Requests for new damage management methods or for damage management in general.
- **Human Safety Protection:** Issues involving human safety that do not have to do with disease or aviation.
- **Invasive Species:** Any request involving an invasive species.
- **Natural Resource Protection:** Issues with resources such as timber, endangered species, or game species.
- **Predation:** Any predation issues having to do with livestock or poultry. (Predation involving other species is categorized as "Aquaculture Protection" or "Natural Resource Protection.")
- **Property Protection:** Issues involving human property.
- **Miscellaneous:** Anything that did not fit in another category.

Research Needed

- **Baits/Lures** and attractants.
- **Capture Methods** including traps.
- **Contraception**
- **Damage Analysis:** Research that would determine the extent of damage or the impact of a damaging species.
- **Damage Management Methods:** Requests for new methods of damage management, damage management in general, or methods not covered in any of the other categories.
- **Delivery Systems**
- **Ecological Information**
- **Economic Assessments**
- **Evaluations:** Of technology or program/damage management method efficacy. Also includes risk assessment requests.
- **Genetics:** Requests specifically involving genetics or DNA.
- **Habitat Alteration**
- **Hazing Methods**
- **Non-Lethal Methods** in general.
- **Population Control** in general.
- **Repellents**
- **Surveillance Methods**
- **Toxicants**
- **Vaccines**
- **Other Research:** Research-related requests that did not fit in any other category.
- **Other:** Miscellaneous non-research requests, like updating manuals or collecting statistics.

These categories are not mutually exclusive. For example, some respondents may have cited the need for a specific type of toxicant for a specific species. However, program delivery for a toxicant would involve not only development of the toxicant, but it would also involve other categories not specifically mentioned (e.g. lures to attract the target, baits to deliver the toxicant to the target, development of a delivery system, ecological information for NEPA considerations, and possibly an economic evaluation of need, efficiency, and benefit-cost analysis). Additional research category items such as registration support, prototyping, and technology transfer are also needed for effective and complete program delivery. In summary, although a specific research need is mentioned, other research and non-research investments are needed for complete program delivery to be achieved.

Requests by Problem Area

This table contains the number of surveys requesting research involving each topic, broken down by first, second, and third research need. The total number of responses does not add up to 208 since some requests could be classified as two different topics and some people requested more than three things.

Table 1: Number of research requests by broad problem area

| | First | Second | Third | Total |
|------------------------------------|-------|--------|-------|-------|
| Aquaculture Protection | 2 | 1 | - | 3 |
| Aviation | 6 | 7 | 8 | 21 |
| Crop Protection | 5 | 3 | - | 8 |
| Dairies/Feedlots | 1 | 3 | 1 | 5 |
| Disease-Livestock | 1 | 1 | - | 2 |
| Disease-Rabies | 1 | 2 | 1 | 4 |
| Disease-Zoonoses | 2 | 1 | 2 | 5 |
| Disease-Other | 1 | 4 | 2 | 7 |
| General | 4 | - | 2 | 6 |
| General Conflict | 4 | 5 | 5 | 14 |
| General Damage Management | 14 | 12 | 21 | 47 |
| Human Safety Protection | - | - | 1 | 1 |
| Invasive Species | 18 | 17 | 5 | 40 |
| Natural Resource Protection | 4 | 2 | 4 | 10 |
| Predation | 10 | 12 | 4 | 26 |
| Property Protection | 1 | - | 2 | 3 |
| Miscellaneous | 3 | 5 | 5 | 13 |

Requests for general damage management were the most common, followed by requests involving invasive species. Predation and aviation safety were also seen as important issues.

Requests by Research Needed

Table 2 contains the number of surveys requesting research involving each type of research needed, broken down by first, second, and third research need. The total number of responses does not add up to 208 since some requests could be classified as two different types of research, some requests did not specify a type of research, and some people requested more than three things.

Table 2: Number of research requests by type of research needed

| | First | Second | Third | Total |
|----------------------------------|-------|--------|-------|-------|
| Baits/Lures | 1 | 1 | - | 2 |
| Capture Method | - | 2 | 2 | 4 |
| Contraception | - | 2 | 1 | 3 |
| Damage Analysis | 3 | 3 | 1 | 7 |
| Damage Management Methods | 17 | 13 | 8 | 38 |
| Delivery System | 2 | 4 | 1 | 7 |
| Ecological Information | 4 | 2 | 4 | 10 |
| Economic Assessment | 6 | 6 | 7 | 19 |
| Evaluation | 7 | 4 | 7 | 18 |
| Genetics | 2 | 1 | 1 | 4 |
| Habitat Alteration | 2 | 3 | - | 5 |
| Hazing Methods | 4 | - | 2 | 6 |
| Non-Lethal Methods | 2 | 7 | 6 | 15 |
| Population Control | 2 | 1 | 1 | 4 |
| Population Modeling | 6 | 6 | 1 | 13 |
| Repellent | 1 | - | 1 | 2 |
| Surveillance Method | 2 | 1 | 2 | 5 |
| Toxicant | 8 | 6 | 3 | 17 |
| Vaccine | - | 2 | - | 2 |
| Other Research | 5 | 9 | 11 | 25 |
| Other | 2 | - | 1 | 3 |

Damage management methods in general and economic assessments were the most requested research needs. Evaluations, toxicants, non-lethal methods in general, population models, and ecological information were also requested often.

Requests by Animal

Some reports specifically mentioned animals. Feral swine were mentioned the most, followed by birds and then beavers. The total number of responses does not add up to 208 since some requests mentioned several animals and some requests did not mention an animal.

Table 3: Number of research requests by animal

| Animal | Number of Requests |
|-------------------------|--------------------|
| Feral Swine | 29 |
| Birds (General) | 13 |
| Beaver | 11 |
| Coyote | 8 |
| Blackbird | 6 |
| Wolves | 6 |
| Brown Tree Snake | 5 |
| Starlings | 5 |
| T&E Species (General) | 5 |
| Vultures | 5 |
| Bear | 4 |
| Crows | 3 |
| Deer | 3 |
| Reptiles (General) | 3 |
| Turkey | 3 |
| Atlantic Brant | 2 |
| Bats | 2 |
| Birds of Prey (General) | 2 |
| Canada Geese | 2 |
| Cormorants | 2 |
| Eagles | 2 |
| Geese | 2 |
| Nutria | 2 |

| Animal | Number of Requests |
|--------------------------|--------------------|
| Pigeons | 2 |
| Ravens | 2 |
| Sage Grouse | 2 |
| Amphibians | 1 |
| Big Game (General) | 1 |
| Canines (General) | 1 |
| Carnivores (General) | 1 |
| Corvids (General) | 1 |
| Feral Cats | 1 |
| Gulls | 1 |
| Mesocarnivores (General) | 1 |
| Mountain Lions | 1 |
| Piping Plover | 1 |
| Prairie Dogs | 1 |
| Raccoons | 1 |
| Rodents (General) | 1 |
| Salmonids | 1 |
| Sandhill Cranes | 1 |
| Skunks | 1 |
| Sparrows | 1 |
| Ungulates (General) | 1 |
| Woodpeckers | 1 |

Other Topics

Several other topics were repeated often enough to deserve special mention. A specification of damage or control in urban areas appeared ten times. Four requests each were received for risk assessments and studies on the effects of relocating animals. Three requests mentioned nighttime roosting birds.

MULTIPLE CHOICE METHODS

The multiple choice questions were divided into four broad sections, asking respondents to rate:

- The likely importance of various human-wildlife conflicts during the next five years in terms of impact on production, economics, human health & safety, and/or property damage.
- Their likely involvement as a wildlife professional in various areas of human-wildlife conflicts during the next five years.
- The likely level of need in their state or region over the next five years for research to develop, improve, and/or evaluate different methods, tools, or information.
- The likely importance of consultations and services offered by the NWRC to their job during the next five years.

Most questions also contained an “Other” option where respondents could write in to specify answers not given as part of the survey. Answers where more than one respondent gave the same reply are detailed below.

All questions from the Importance and Involvement sections of the survey in which less than 50% of respondents replied “Minimal” or “Not” were broken down by region. One of the survey questions asked respondents to specify whether they were part of the Eastern Region, Western Region, or National Wildlife Research Center. Respondents could also answer “N/A,” but those who did so were discarded from this part of the analysis. Respondents were also asked to provide their principle job. Those who answered Eastern or Western Region and “WS State Director,” “WS Assistant State Director,” “WS Biologist,” or “WS District Supervisor” as their employment were left in the analysis. Those who specified another job were discarded. All participants who marked “NWRC” as their region were left in the analysis.

All questions from the Importance and Needs sections of the survey were broken down by whether the participant worked in Operations or Research. One of the survey questions asked respondents to specify their current employment. Two of the choices were “APHIS-Wildlife Services-Operations” and “APHIS-Wildlife Services-NWRC.” Respondents were also asked to provide their principle job. Those who answered “APHIS-Wildlife Services-Operations” and “WS State Director,” “WS Assistant State Director,” “WS Biologist,” or “WS District Supervisor” as their employment were categorized as Operations. All who responded they were from the NWRC and specified a job other than “WS State Director” were categorized as Research. Anyone who did not fit one of these descriptions was discarded from this portion of the analysis.

LIKELY FUTURE IMPORTANCE OF HUMAN-WILDLIFE CONFLICT AREAS

Respondents were asked to indicate the likely importance of areas of human-wildlife conflict in their state or region over the next five years in terms of impact on production, economics, human health, human safety, and property damage. They could rate each conflict area “Highly Important,” “Moderately Important,” or “Minimally Important.”

Importance of Predation on...

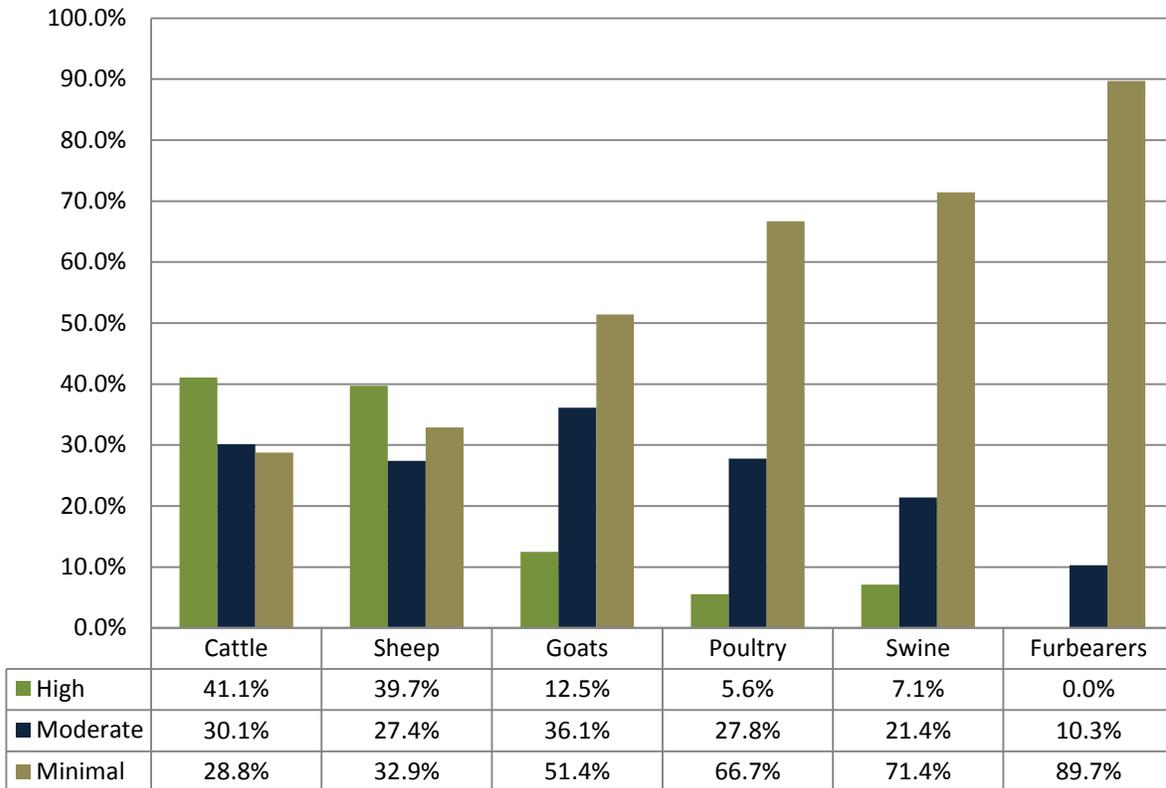


Figure 6: Summary of responses on the importance of predation on different animals

Between 68 and 73 people answered each of these questions. Five people also wrote that predation on pets was important.

Less than 50% of participants responded “Minimally Important” to cattle and sheep predation. Predation was believed to be the most important in the West, with no respondents rating it “Minimally Important.” Predation was also believed to be slightly more important by Operations than by Research.

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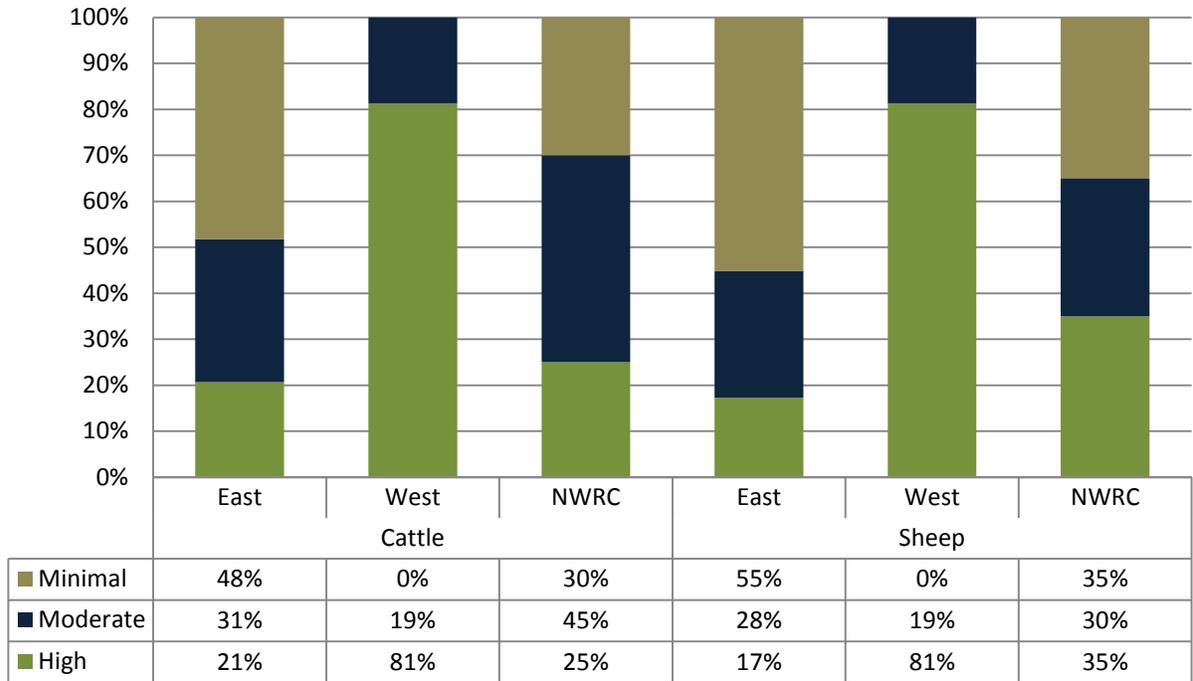


Figure 7: Regional distribution of responses on the importance of predation on different animals

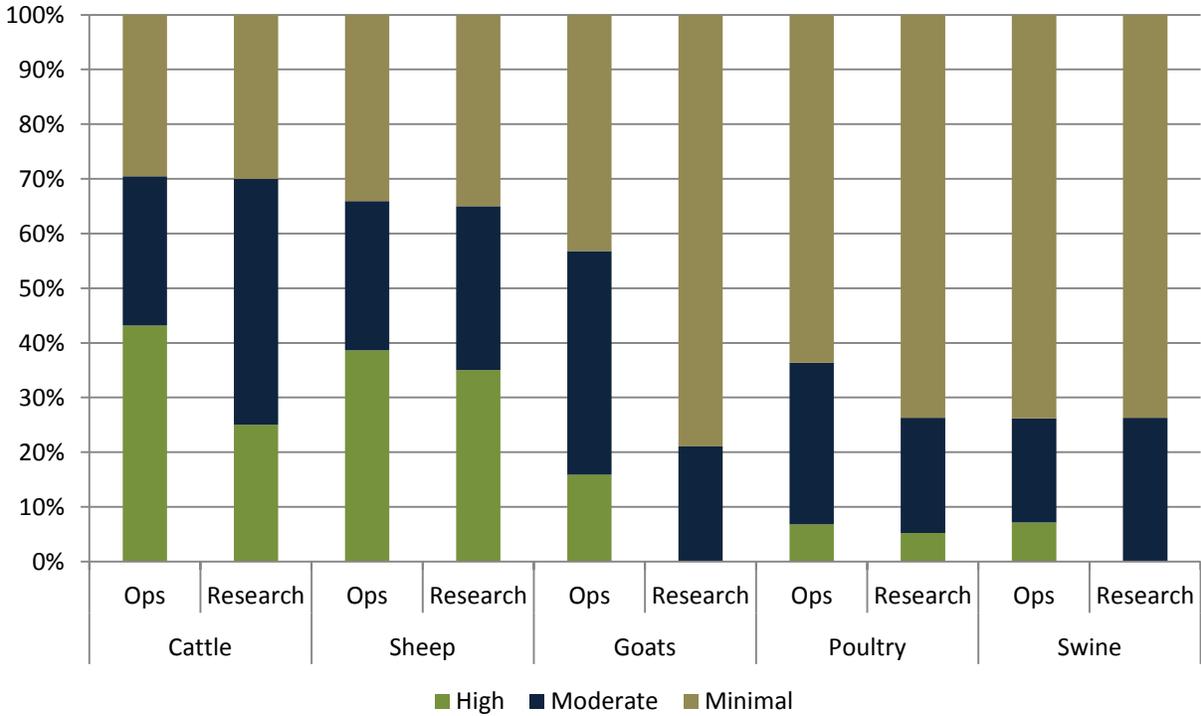


Figure 8: Importance of predation on different animals broken down by Operations and Research

Importance of Wildlife Damage to Crops and Agricultural Commodities

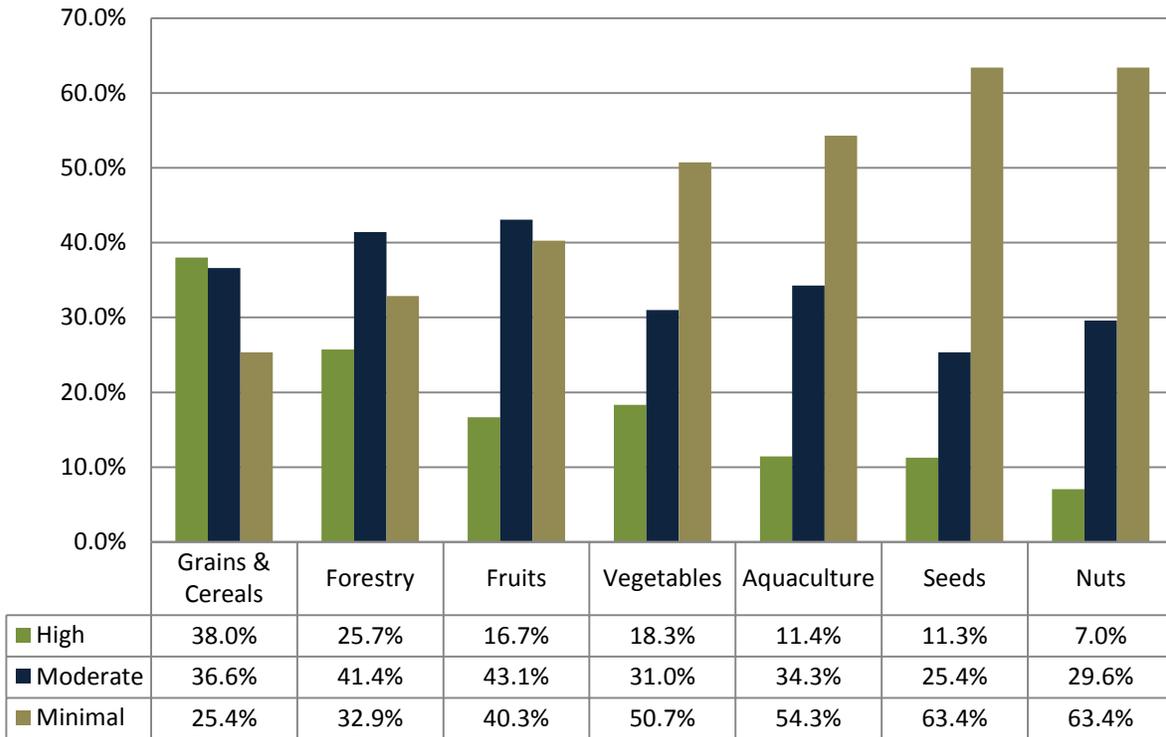


Figure 9: Summary of responses on the importance of damage to crops

Between 70 and 72 people answered the questions in this section. Less than 50% of respondents answered that damage to grain & cereal crops, fruit crops, and forestry was minimally important. People in the East and West viewed grain & cereal crops and fruit crops similarly. Respondents from the NWRC viewed these crops as slightly less important. Forestry was much more important in the East and West than at the NWRC, as more than half of NWRC respondents considered damage to forestry to be minimally important. In general, operations perceived crop damage as more important than researchers did.

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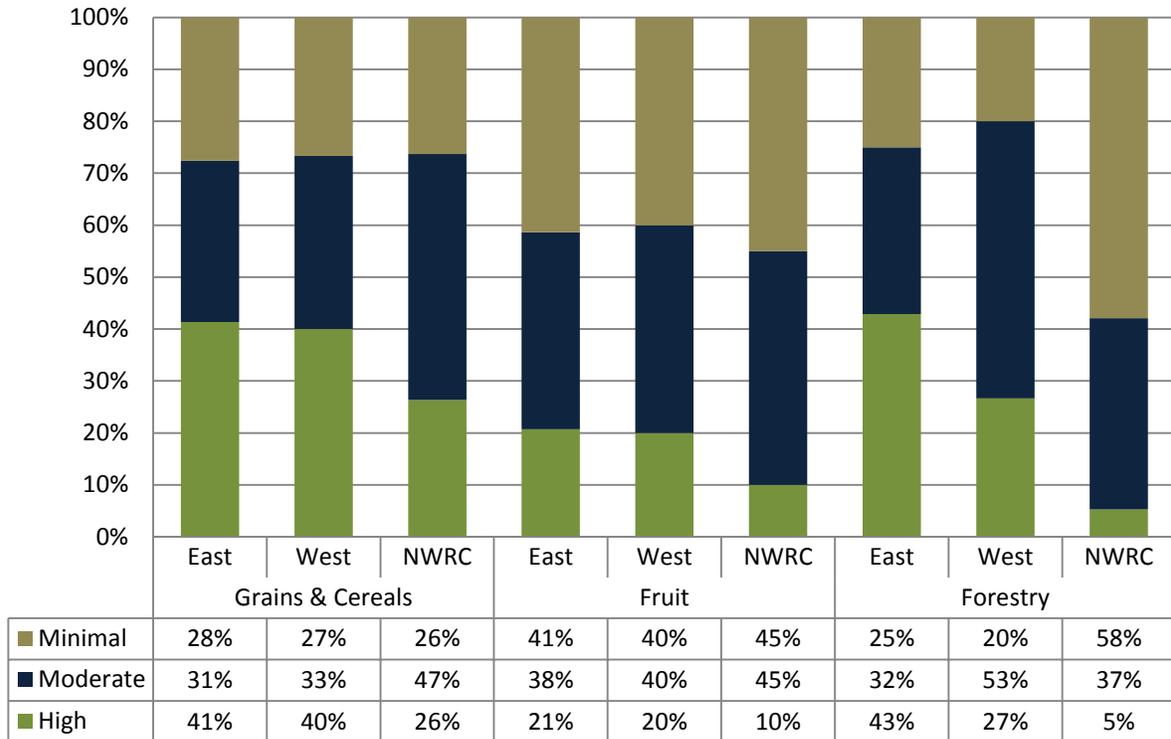


Figure 10: Regional summary of responses on the importance of damage to crops

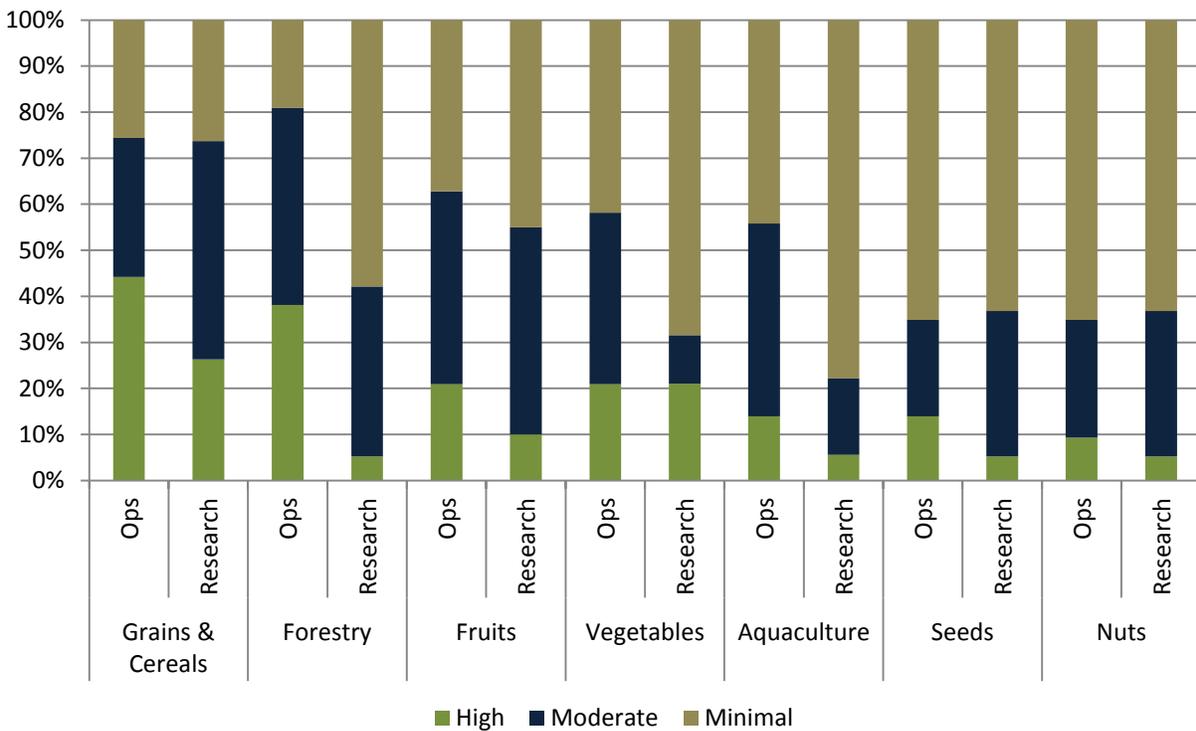


Figure 11: Importance of crop damage broken down by Operations and Research

Importance of Wildlife Disease Issues Impacting...

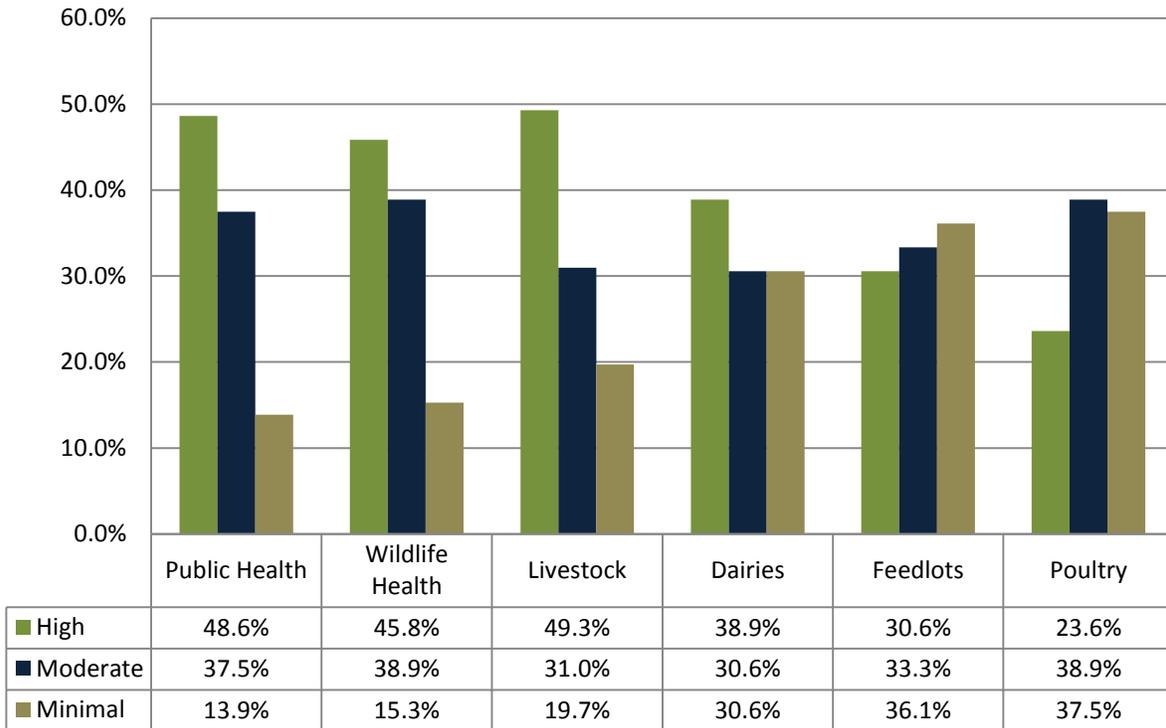


Figure 12: Summary of responses on the importance of wildlife disease impacts

71 to 72 people answered the questions in this section. All wildlife disease issues were believed to be minimally important by less than 50% of respondents. Respondents from all regions responded similarly to disease issues impacting dairies, but opinions on the other issues varied widely. The West put the highest importance on issues impacting livestock, feedlots and wildlife health. Over half of Easterners also rated issues impacting livestock as highly important, but half rated feedlots as minimally important. Respondents from the NWRC put less importance on public health than the other regions.

Issues impacting public health, livestock, and dairies were seen as more important in Operations. Issues impacting feedlots and poultry were viewed as more important by Research. Issues impacting wildlife health were viewed similarly by Operations and Research.

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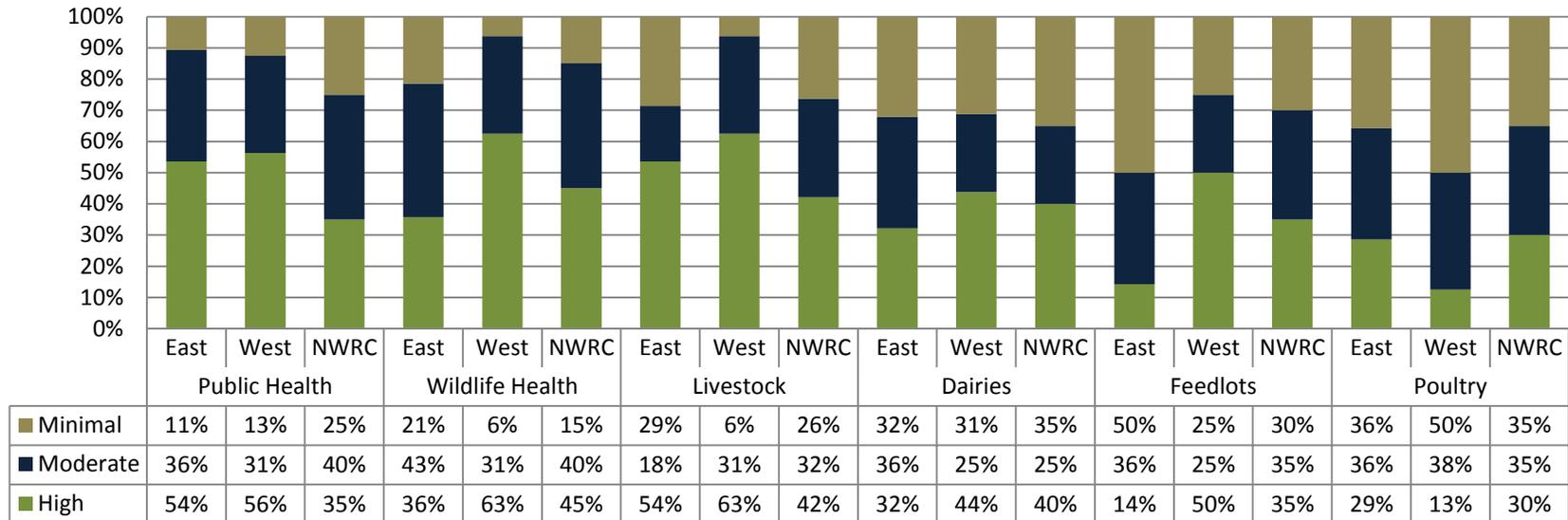


Figure 13: Regional distribution of responses on the importance of wildlife disease impacts

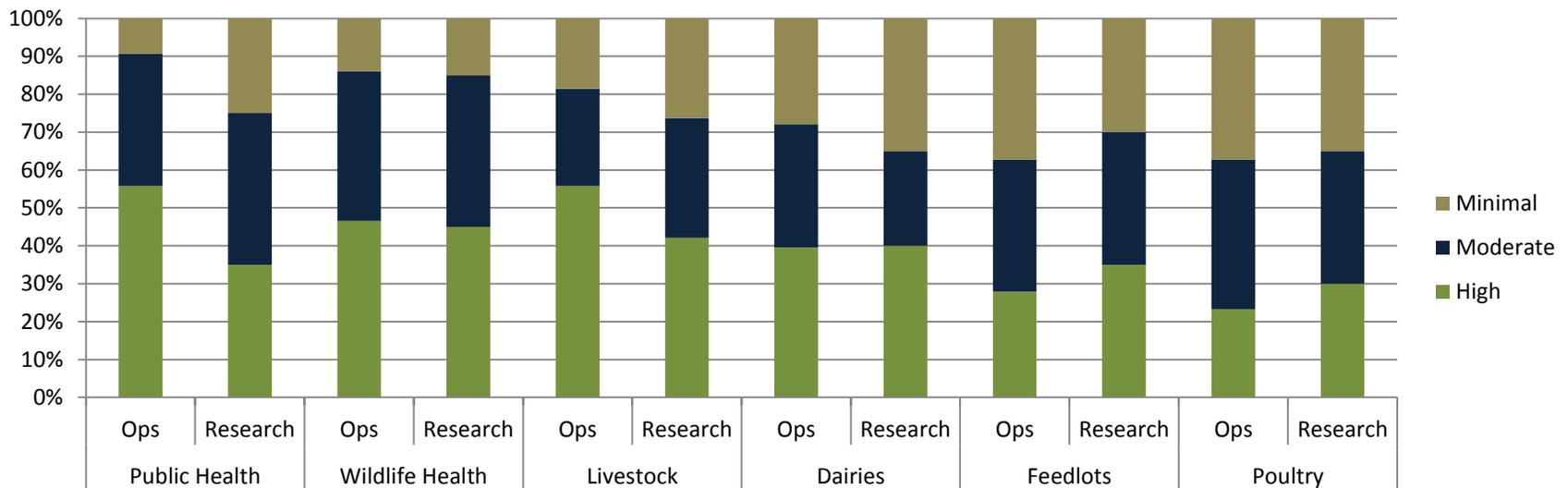


Figure 14: The importance of wildlife disease impacts broken down by Operations and Research

Importance of Wildlife Impacts on Other Wildlife

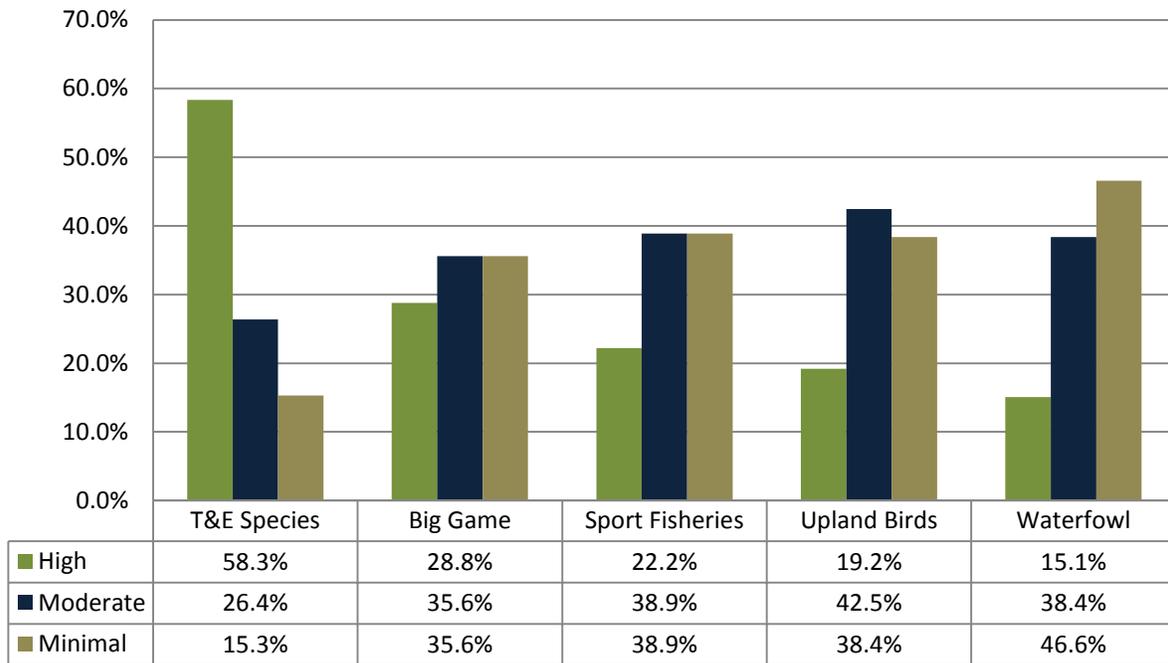


Figure 15: Summary of responses on the importance of wildlife impacts on other wildlife

72 to 73 people answered the questions in this portion of the survey. All topics were believed to be minimally important by less than 50% of survey respondents. All regions had similar opinions on the importance of wildlife impacts on sports fisheries. Big game was considered most important in the West and least important in the East. Fewer Easterners rated threatened and endangered species “Highly Important,” but more Westerners rated them “Minimally Important.” Easterners also saw waterfowl and upland birds as less important.

Operations and research viewed most issues similarly. Sport fisheries were considered slightly less important by research. Research perceived upland birds and waterfowl as more important than operations.

2011 Research Needs Assessment

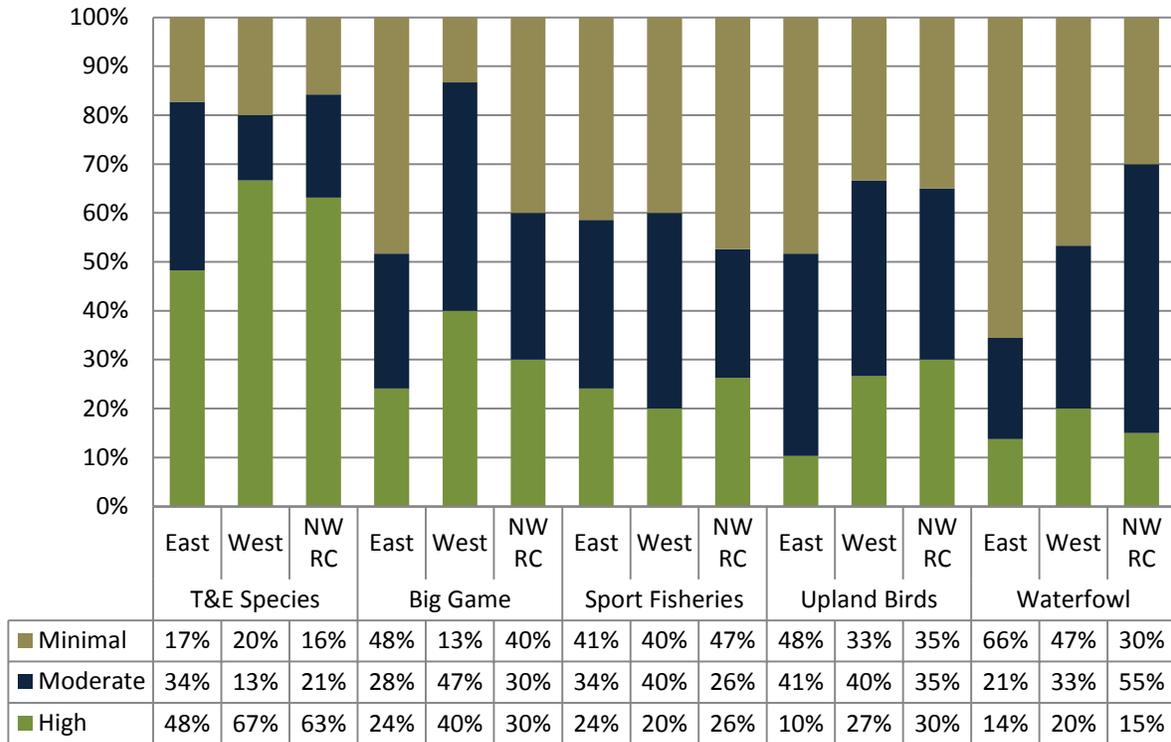


Figure 16: Regional distribution of responses on the importance of wildlife impacts on other wildlife

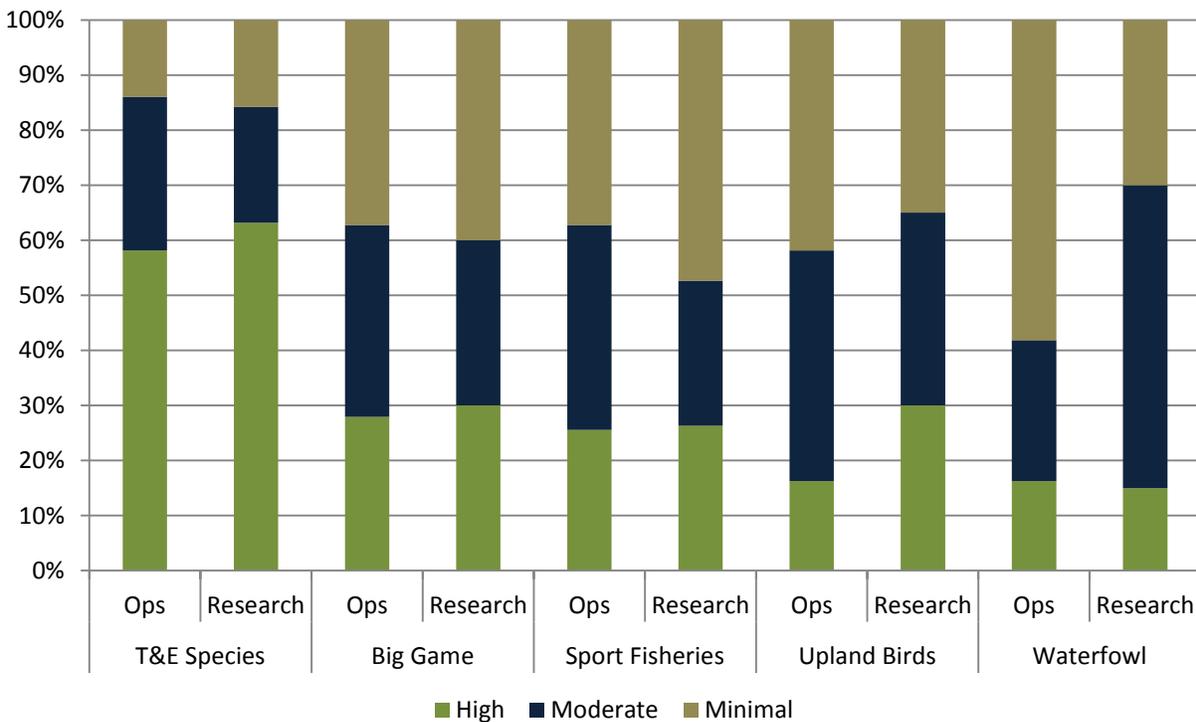


Figure 17: Importance of wildlife impacts on other wildlife broken down by operations and research

Importance of Wildlife Impacts on...

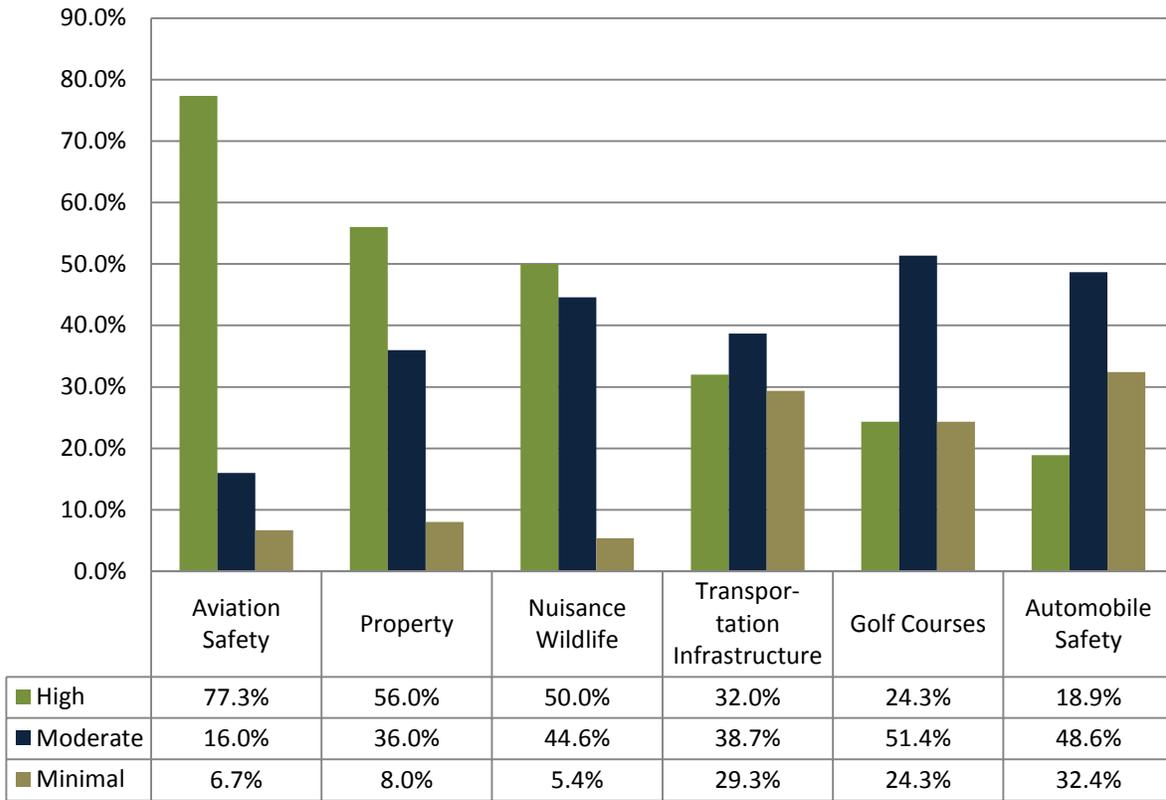


Figure 18: Summary of responses on the importance of wildlife impacts

74 to 75 people answered these questions. All topics were believed to be minimally important by less than 50% of respondents. Aviation safety and wildlife impacts on property were considered less important at the NWRC than in other regions. Nuisance wildlife and automobile safety were regarded as more important by researchers, while the other topics were considered more important by Operations.

2011 Research Needs Assessment

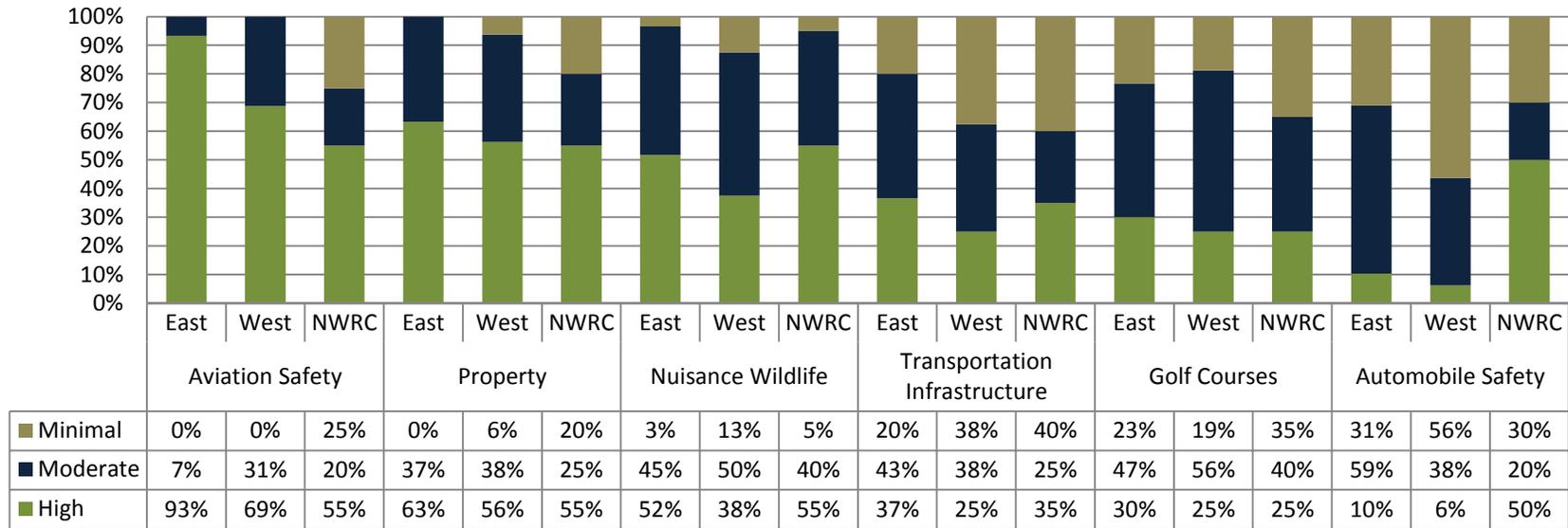


Figure 19: Regional distribution of responses on the importance of wildlife impacts

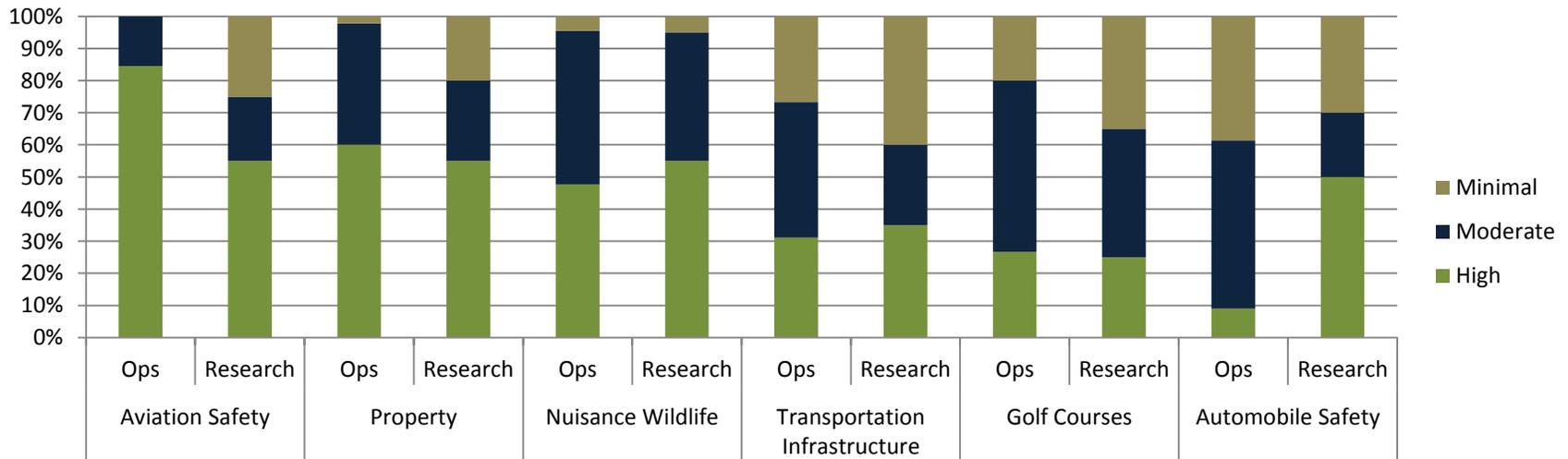


Figure 20: The importance of wildlife impacts broken down by Operations and Research

LIKELY FUTURE INVOLVEMENT IN HUMAN-WILDLIFE CONFLICT AREAS

Respondents were asked to indicate their likely involvement in a variety of areas of human-wildlife conflict in their state or region during the next five years. They could rate their involvement as “Major,” “Moderate,” or “Minimal.”

Involvement with Predation on Sheep by...

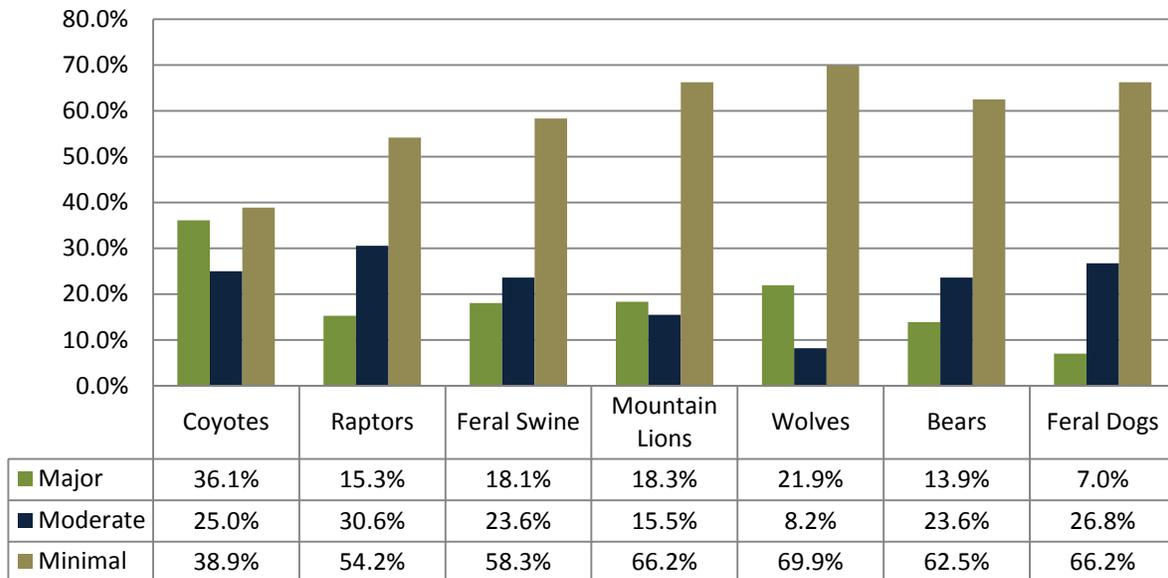


Figure 21: Respondents’ expected future involvement working on sheep predation by each of these predators

Between 71 and 73 people answered this question. Two people expected to be involved with black vulture predation. Less than 50% of respondents believed they would be minimally involved with sheep predation by coyotes. This was considered much more important in the West than in other regions.

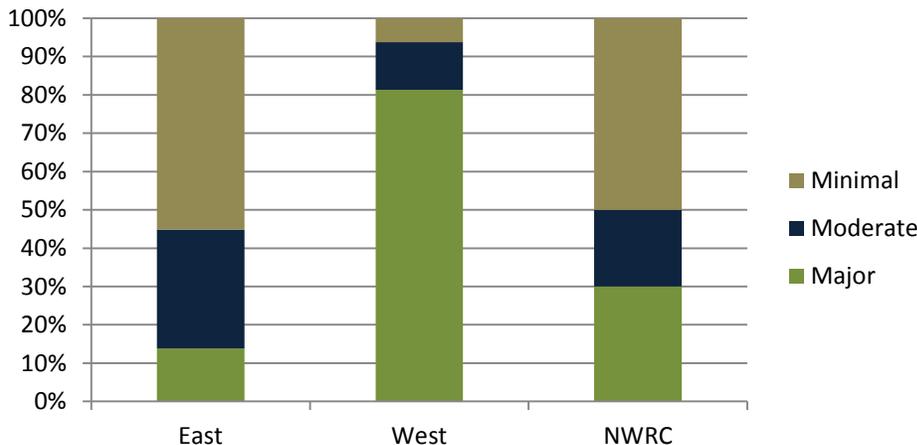


Figure 22: Regional distribution of responses on involvement with predation on sheep by coyotes

Involvement with Predation on Cattle by...

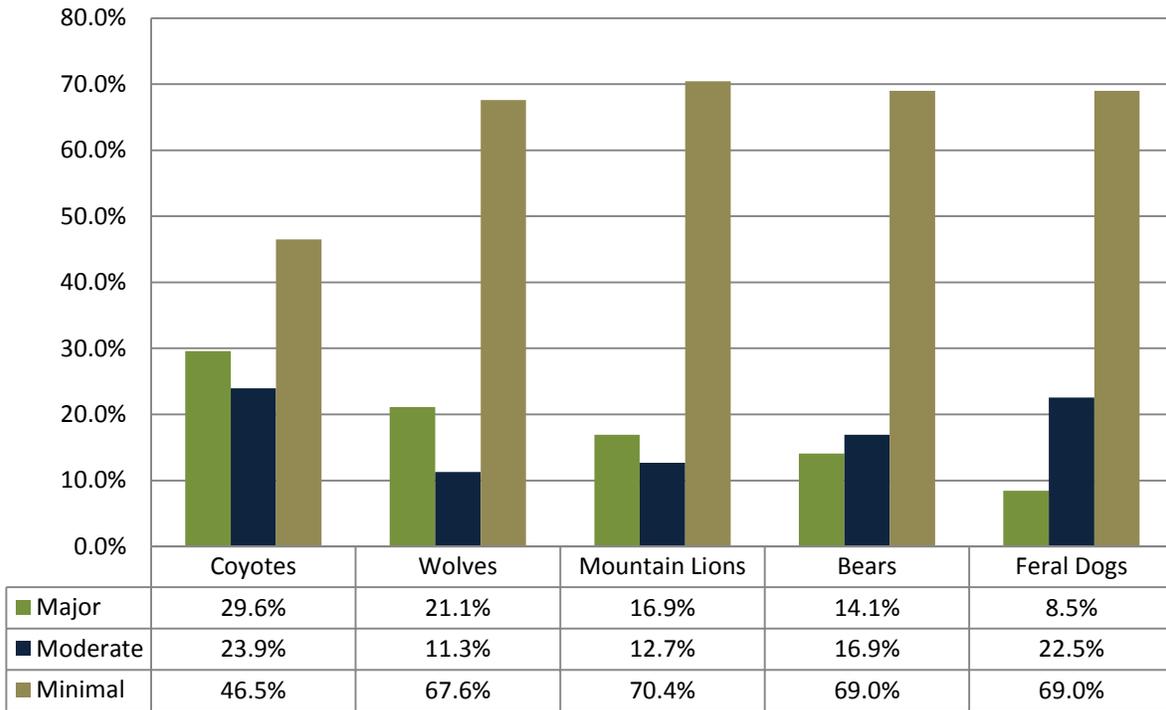


Figure 23: Respondents' expected future involvement working on cattle predation by each of these predators

71 people answered this question. Eight people expect to be involved with black vulture predation. Less than 50% of respondents believed they would be minimally involved with cattle predation by coyotes. This was considered much more important in the West than in other regions.

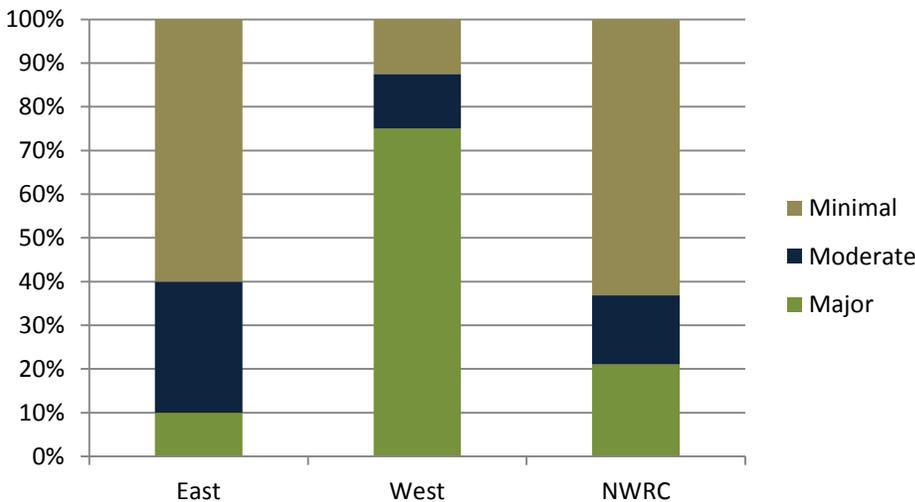


Figure 24: Regional distribution of responses on involvement with predation on cattle by coyotes

Involvement with Livestock Disease Issues

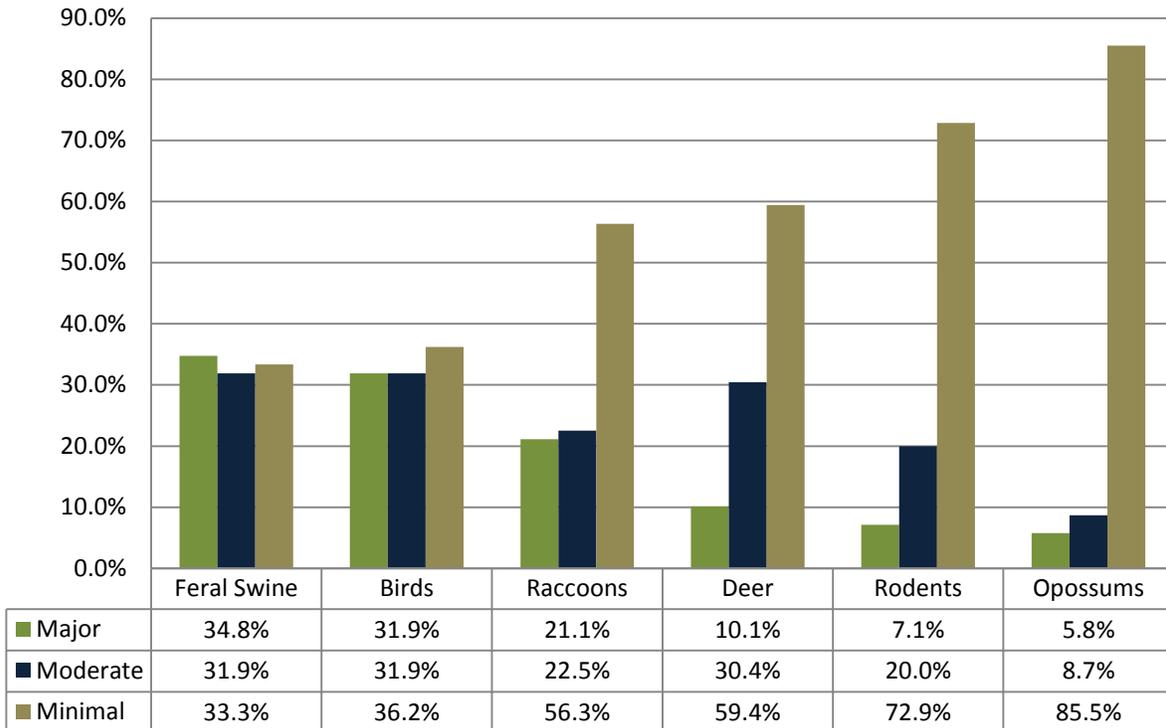


Figure 25: Respondents' expected future involvement working on livestock disease issues

Between 69 and 71 people answered the questions in this portion. Less than 50% of participants responded “Minimal Involvement” to livestock disease issues with feral swine and birds. People from the East expect to be most involved with feral swine, people from the West with birds.

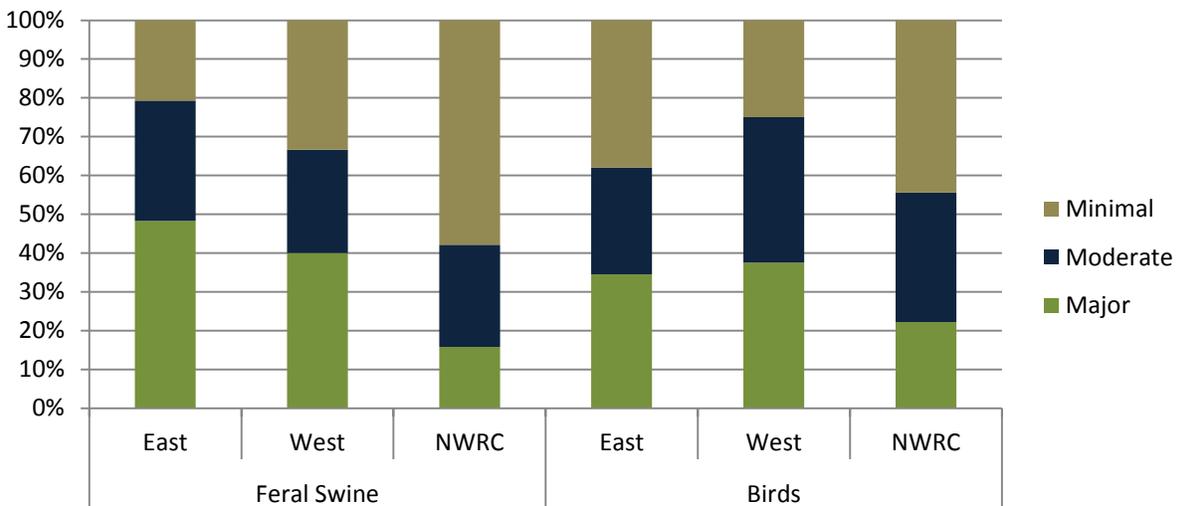


Figure 26: Regional distribution of responses on involvement with livestock disease issues

Involvement with Predation on Poultry by...

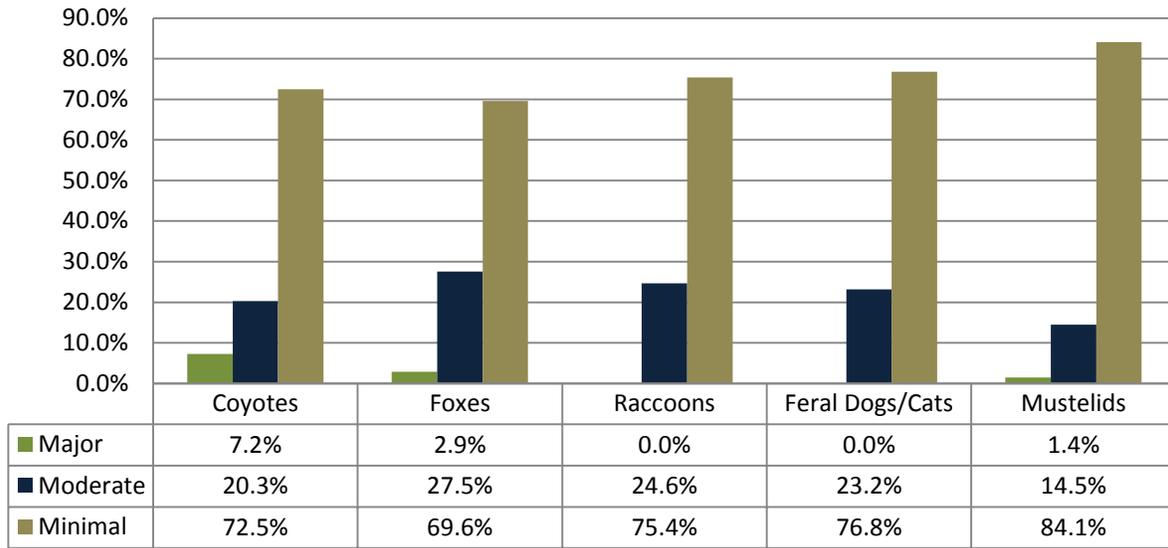


Figure 27: Respondents' expected future involvement working on poultry predation by various predators

69 people answered these questions. More than 50% of respondents expect to be minimally involved with all poultry predators.

Involvement with Poultry Disease Issues

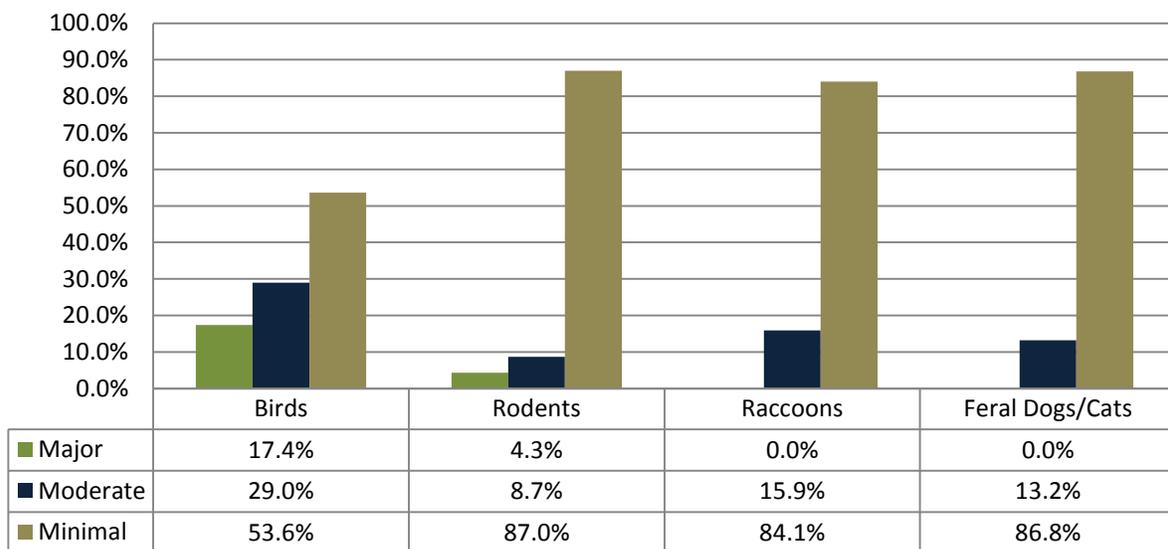


Figure 28: Respondents' expected future involvement working on poultry disease issues

Between 68 and 69 people answered these questions. More than 50% of respondents expect to be minimally involved with all poultry disease issues.

Involvement with Conflicts Concerning Aquaculture & Fisheries

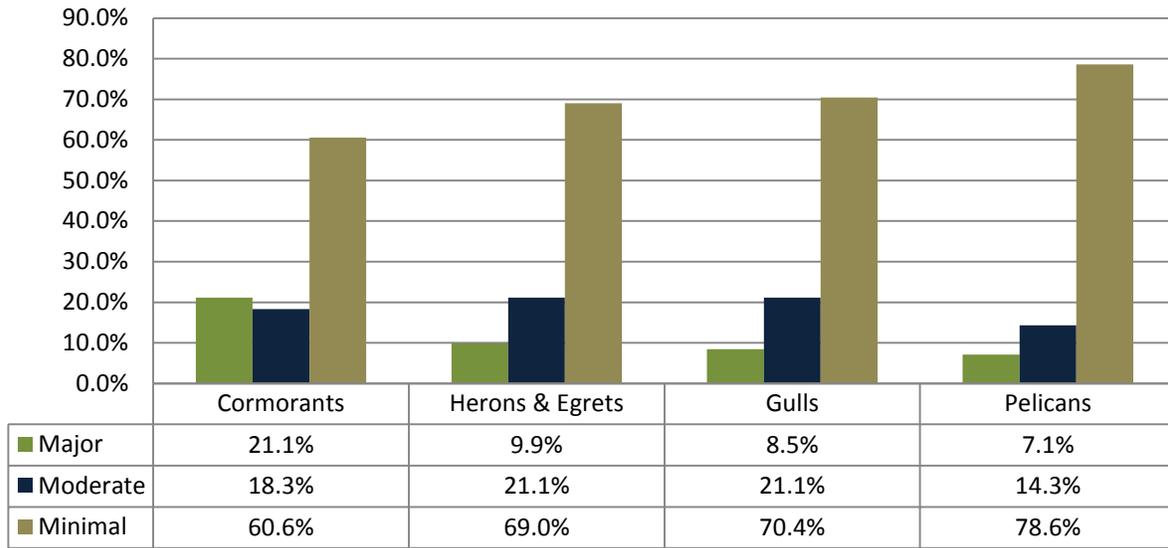


Figure 29: Respondents' expected future involvement working on conflicts concerning aquaculture & fisheries

Between 70 and 71 people answered these questions. More than 50% of respondents expect to be minimally involved with all conflicts concerning aquaculture & fisheries.

Involvement with Conflicts Concerning Fruit Crops

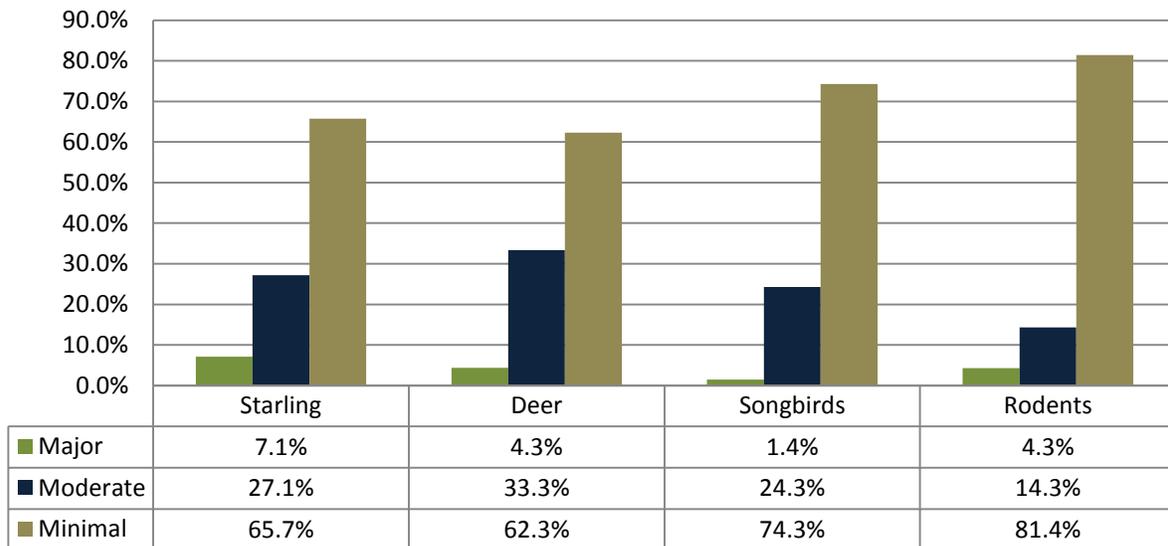


Figure 30: Respondents' expected future involvement working on conflicts concerning fruit crops

Between 69 and 70 people answered these questions. More than 50% of respondents expect to be minimally involved with all fruit crop conflicts.

Involvement with Conflicts Concerning Grain & Cereal Crops

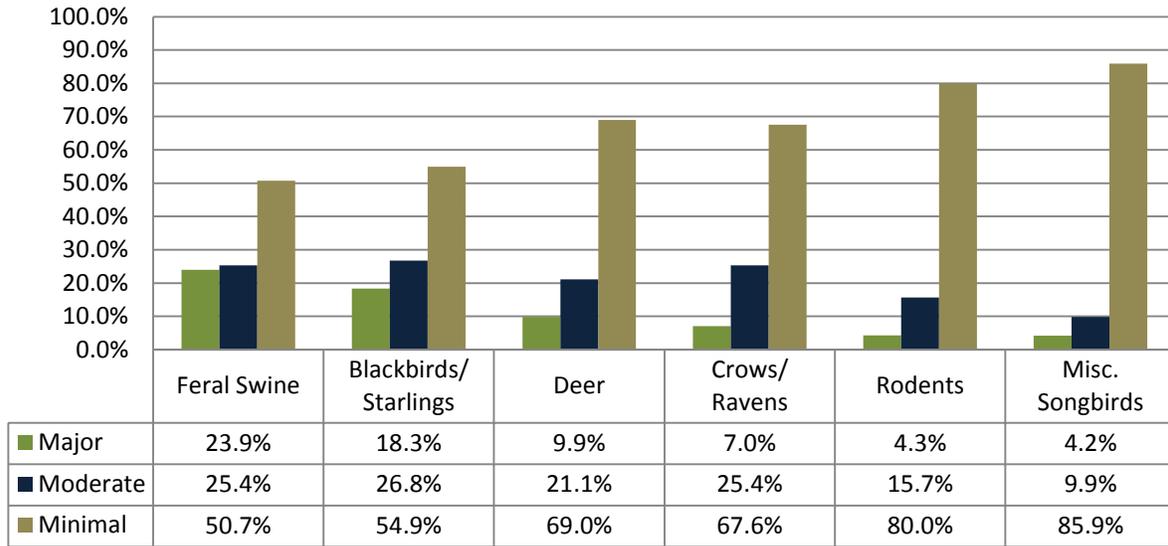


Figure 31: Respondents' expected future involvement working on conflicts concerning grain & cereal crops

71 people answered these questions. Two respondents expect to be involved with Canada geese. More than 50% of respondents expect to be minimally involved with all conflicts concerning grain & cereal crops.

Involvement with Conflicts Concerning Field & Vegetable Crops

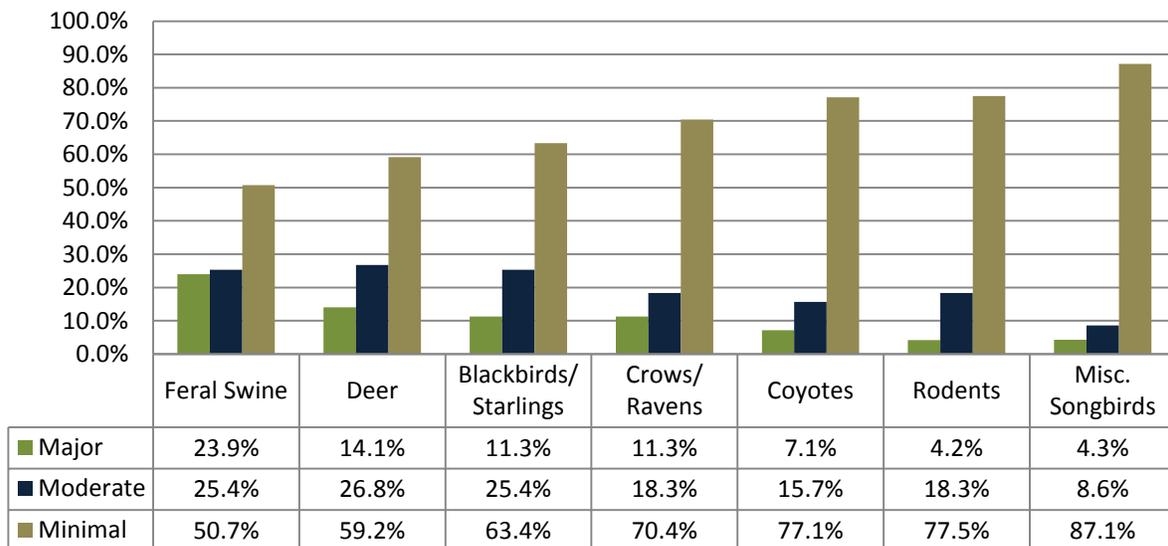


Figure 32: Respondents' expected future involvement working on conflicts concerning field & vegetable crops.

Between 70 and 71 people answered these questions. Two respondents expect to be involved with Canada geese. More than 50% of respondents expect to be minimally involved with all conflicts concerning field & vegetable crops.

Involvement with Conflicts Concerning Habitat Destruction or Degradation

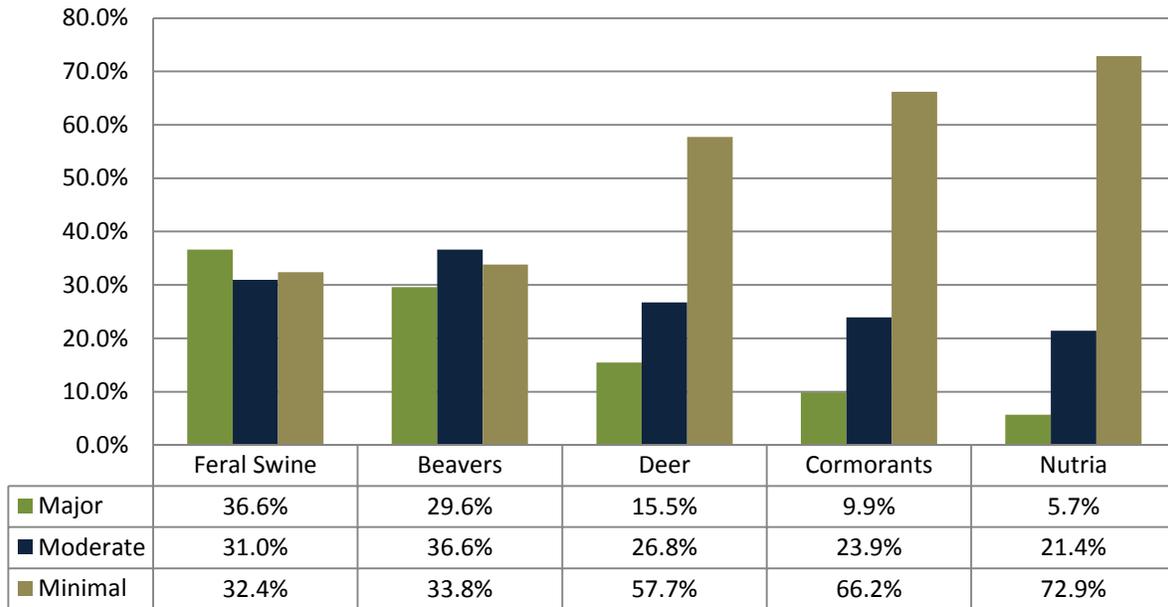


Figure 33: Respondents’ expected future involvement working on conflicts concerning habitat destruction or degradation

Between 70 and 71 people answered the questions in this portion of the survey. Three respondents expect to be involved with Canada geese. Less than 50% of respondents expect to be minimally involved with feral swine and beavers. Those from the East expect to have the most involvement with both habitat issues; those from the NWRC expect the least.

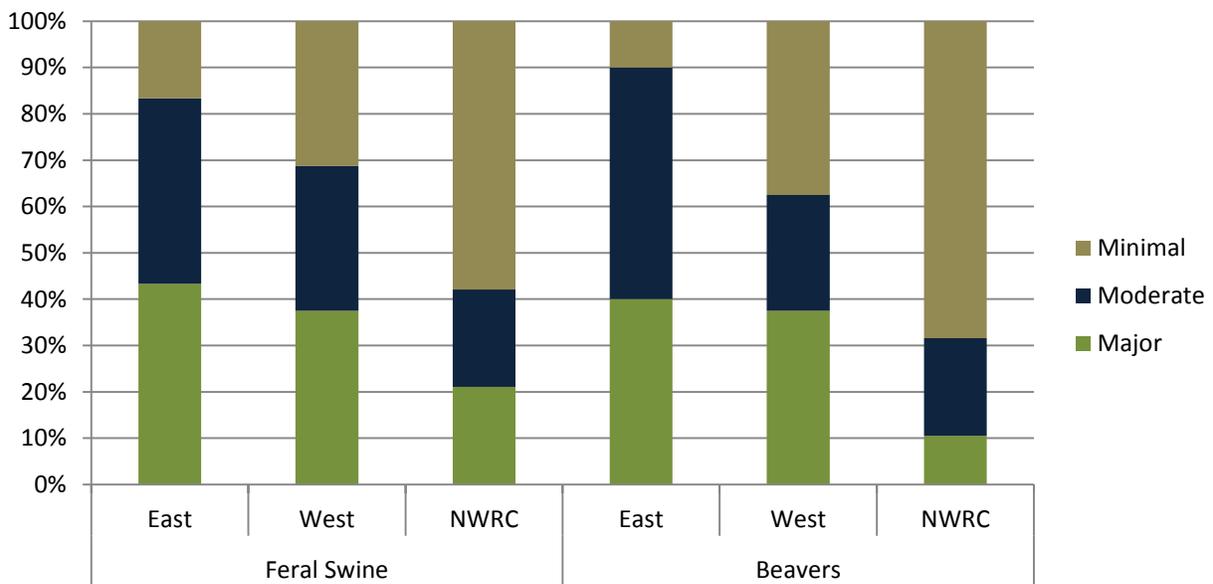


Figure 34: Regional distribution of responses on involvement with habitat destruction/degradation

Involvement with Conflicts Concerning Threatened & Endangered Species

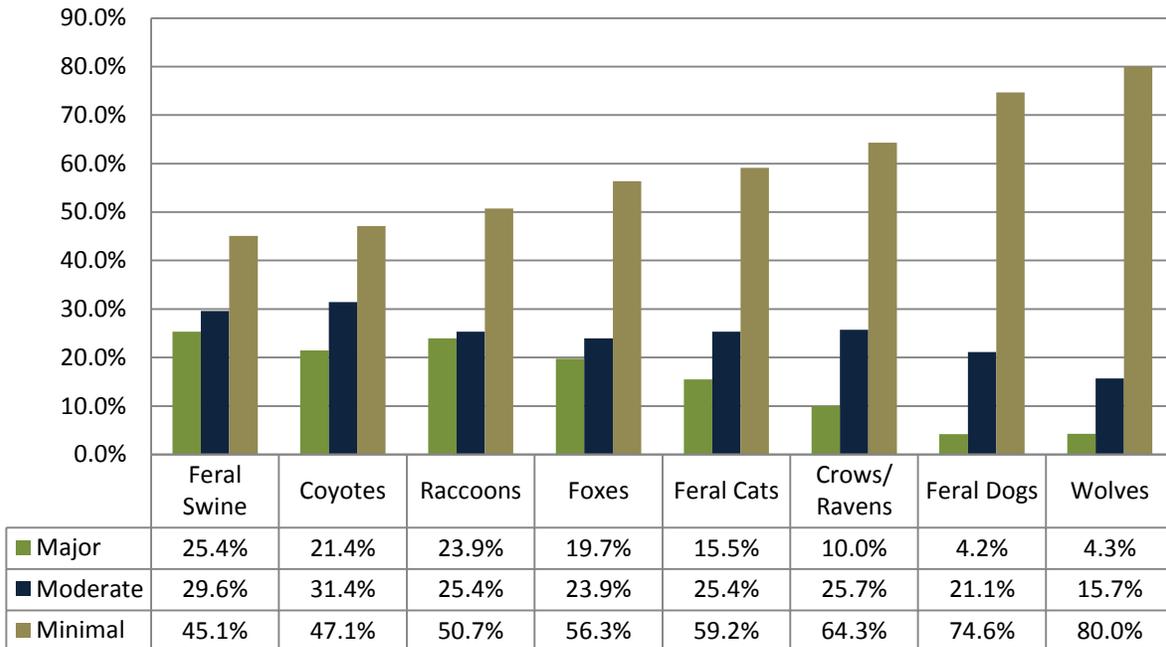


Figure 35: Respondents’ expected future involvement with conflicts concerning threatened and endangered species

Between 70 and 71 people answered these questions. Additionally, four respondents expect to be involved with gulls, three with mongooses, three with rats, and two with brown tree snakes. Less than 50% of respondents expect to be minimally involved with feral swine and coyotes. Those from the East expect to have the most involvement with feral swine, those from the West with coyotes.

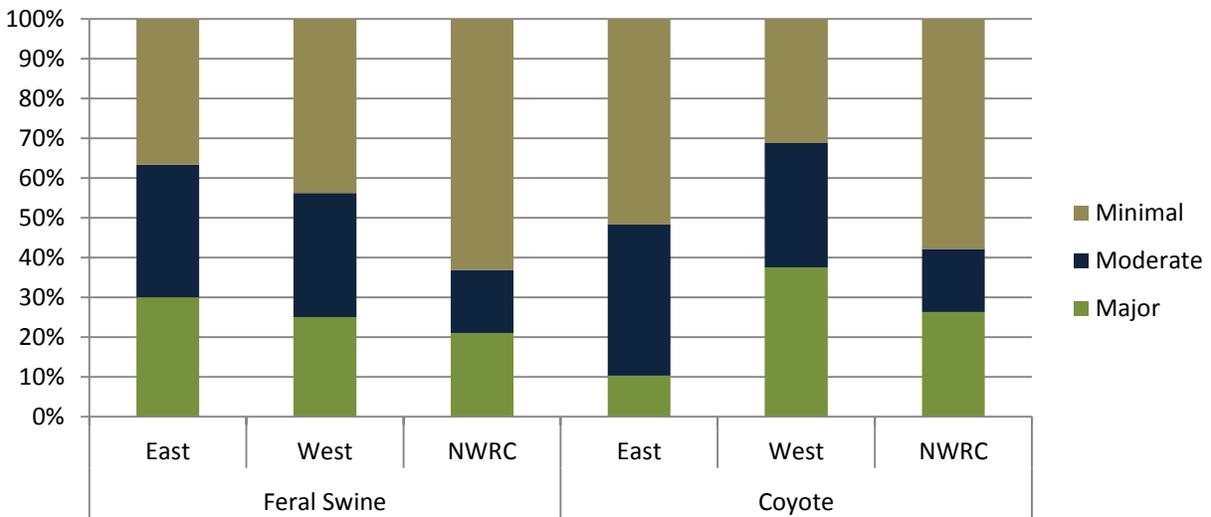


Figure 36: Regional distribution of responses on involvement with conflicts concerning threatened & endangered species

Involvement with Conflicts Concerning Property Damage

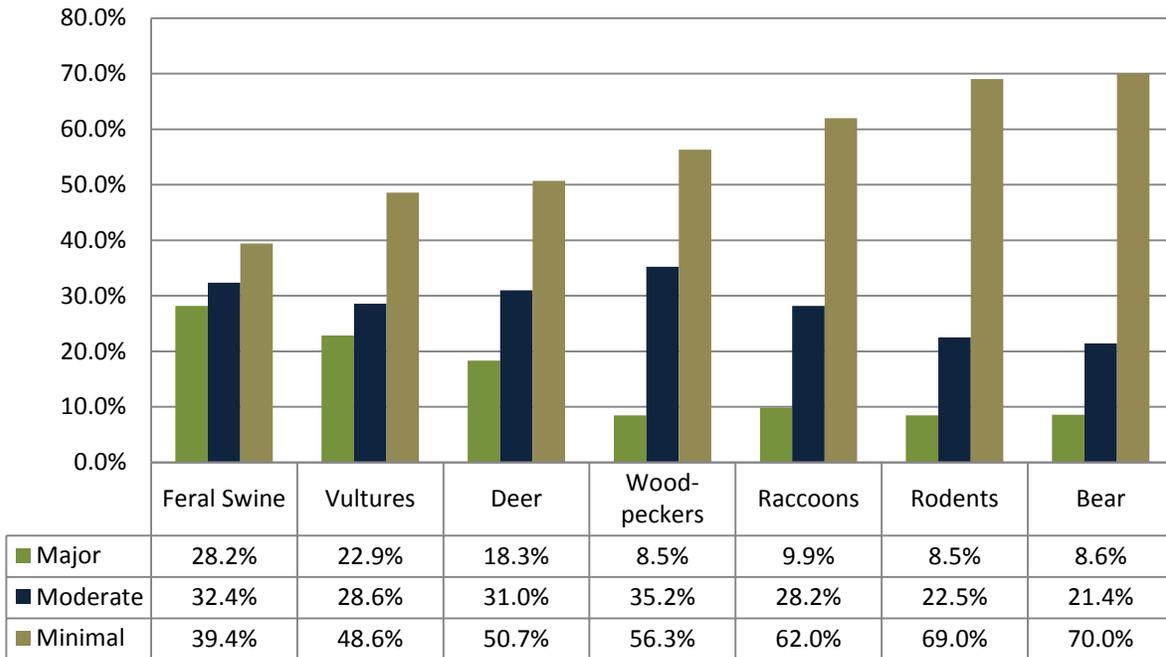


Figure 37: Respondents' expected future involvement with conflicts concerning property damage

Between 70 and 71 people answered these questions. Additionally, two respondents expect to be involved with gulls and two with Canada geese. Less than half of the respondents expect to be minimally involved with feral swine and vultures. People from the East expect to have the most involvement with both of these property damage issues.

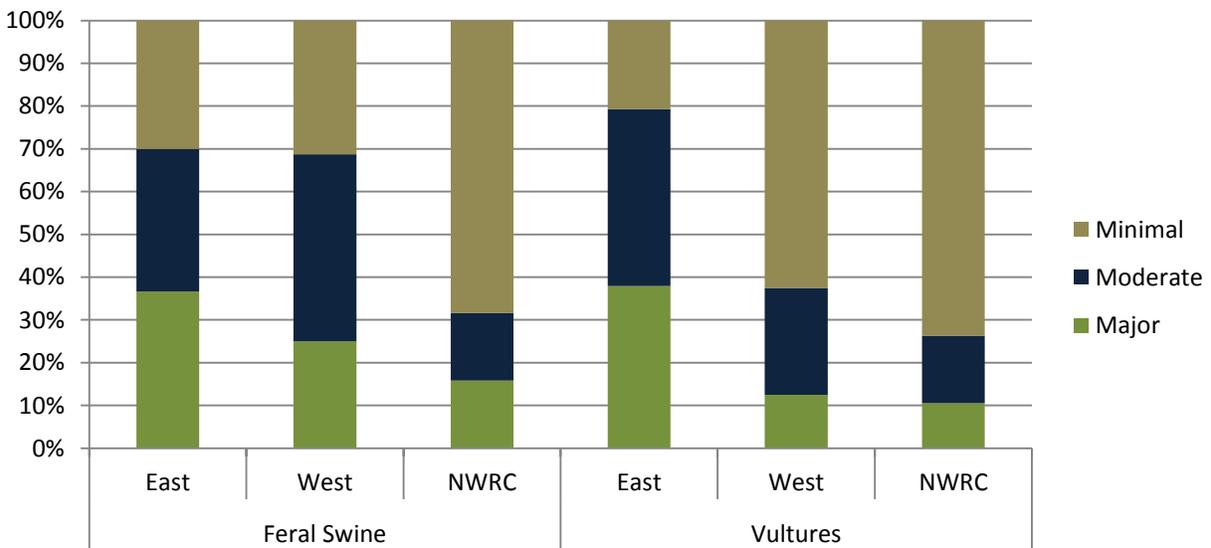


Figure 38: Regional distribution of responses on involvement with human-wildlife conflicts concerning property damage

Involvement with Conflicts Concerning Human Health

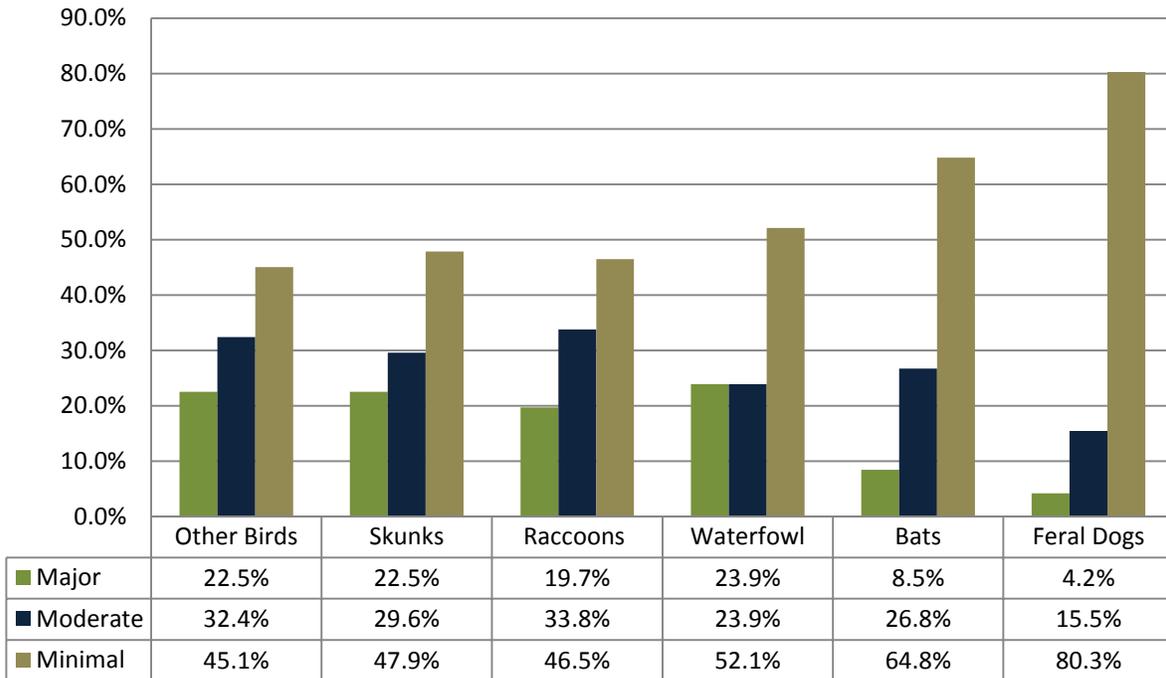


Figure 39: Respondents' expected future involvement with conflicts concerning human health

71 people answered these questions. Additionally, two people expect to be involved with brown tree snakes and two with feral swine. Less than 50% of respondents expect to be minimally involved with birds (excluding waterfowl), skunks, and raccoons. People in the West expect to be the most involved with birds and skunks, people in the East with raccoons.

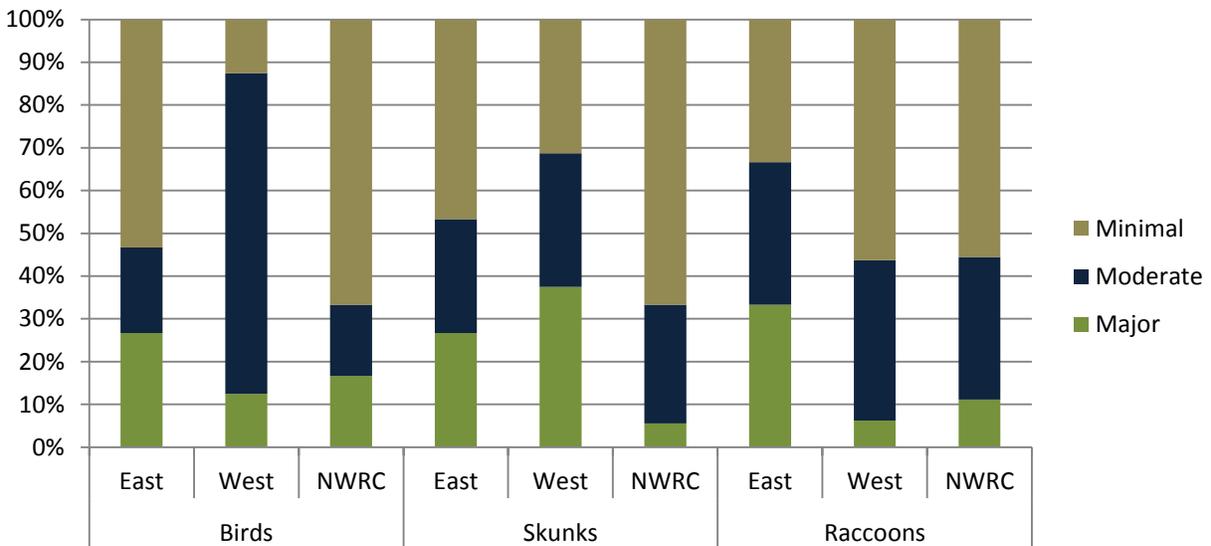


Figure 40: Regional distribution of responses on involvement with conflicts concerning human health

Involvement with Conflicts Concerning Aviation Safety

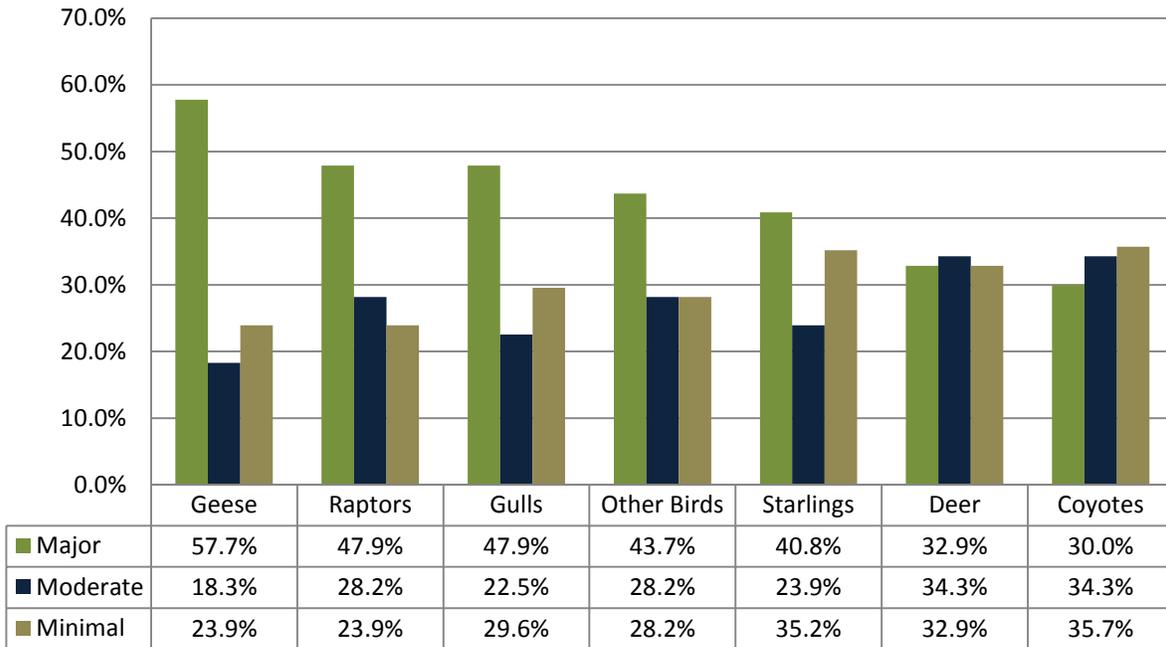


Figure 41: Respondents' expected future involvement with conflicts concerning aviation safety

Between 70 and 71 people answered these questions. Two respondents also expect to be involved with vultures. All of these issues were rated “Minimal Involvement” by less than 50% of respondents. Aviation safety issues were the least important at the NWRC. All issues were the most important in the East except “other birds,” which was slightly more important in the West.

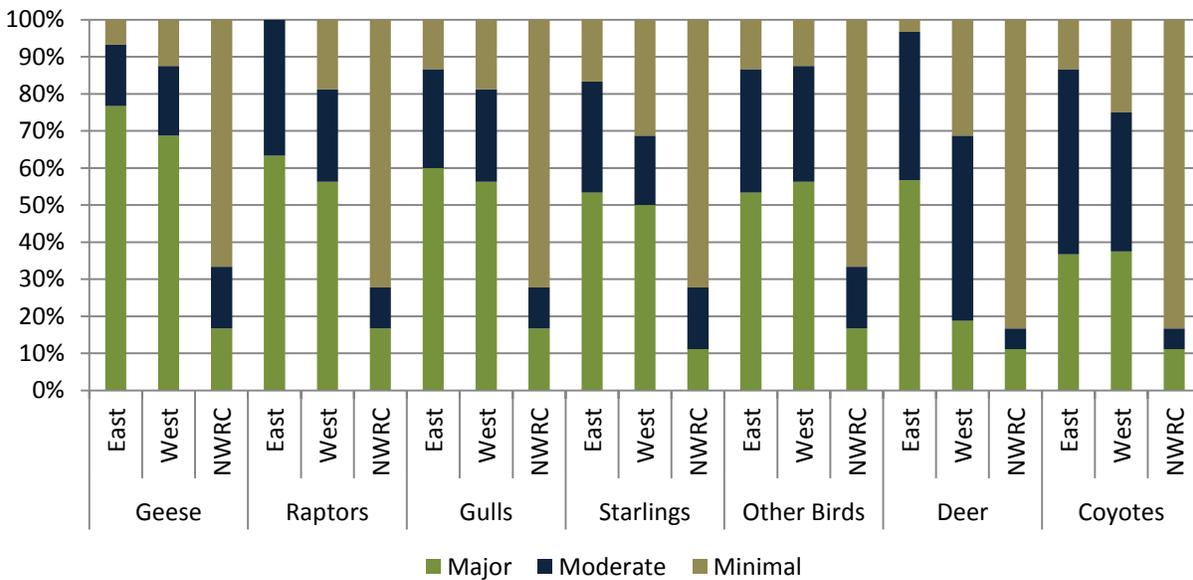


Figure 42: Regional distribution of responses on involvement with aviation safety conflicts

Involvement with Conflicts Concerning the Transportation Infrastructure

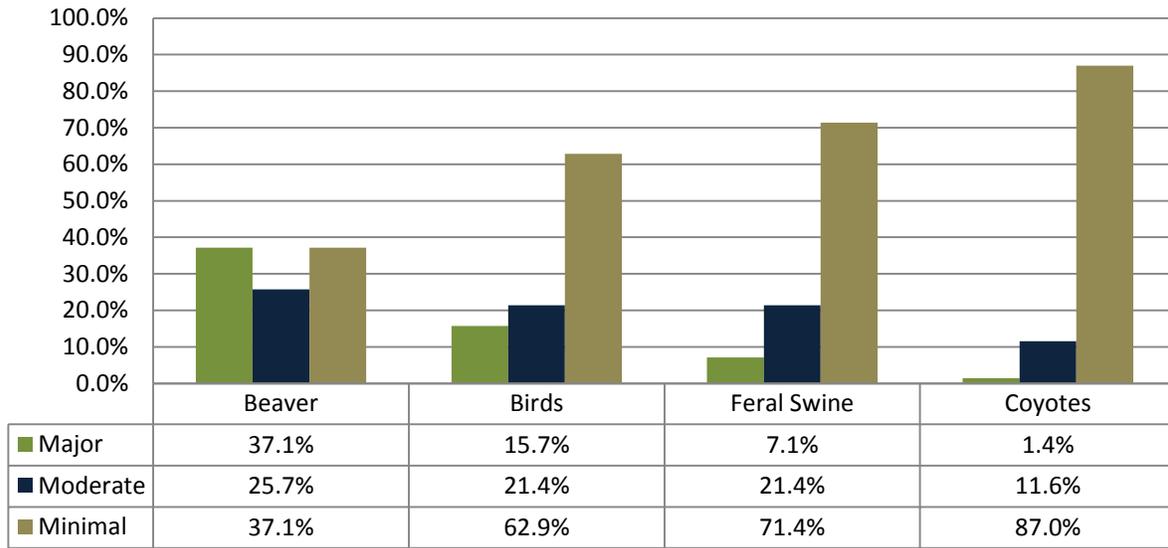


Figure 43: Respondents' expected future involvement with conflicts concerning the transportation infrastructure

Between 69 and 70 people answered these questions. Less than 50% of respondents expect to be minimally involved with beavers. Respondents in the East expect to be the most involved with beavers, respondents from the NWRC the least involved.

Involvement with Conflicts Concerning Automobile Safety

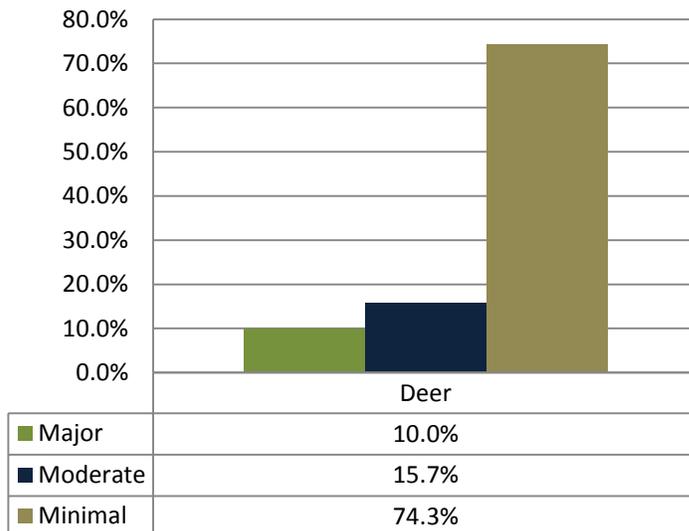


Figure 44: Respondents' expected future involvement with deer and automobile safety

70 people answered this question. Additionally, four people expect to be involved with feral swine and two with geese.

LIKELY FUTURE NEED FOR RESEARCH ON METHODS, TOOLS, AND INFORMATION

Respondents were asked to indicate the likely level of need in their state or region over the next five years for research to develop, improve, and/or evaluate various methods, tools, or information. They could rate each as a “High Need,” “Moderate Need,” or “Minimal Need.”

Need for Predator Management Research

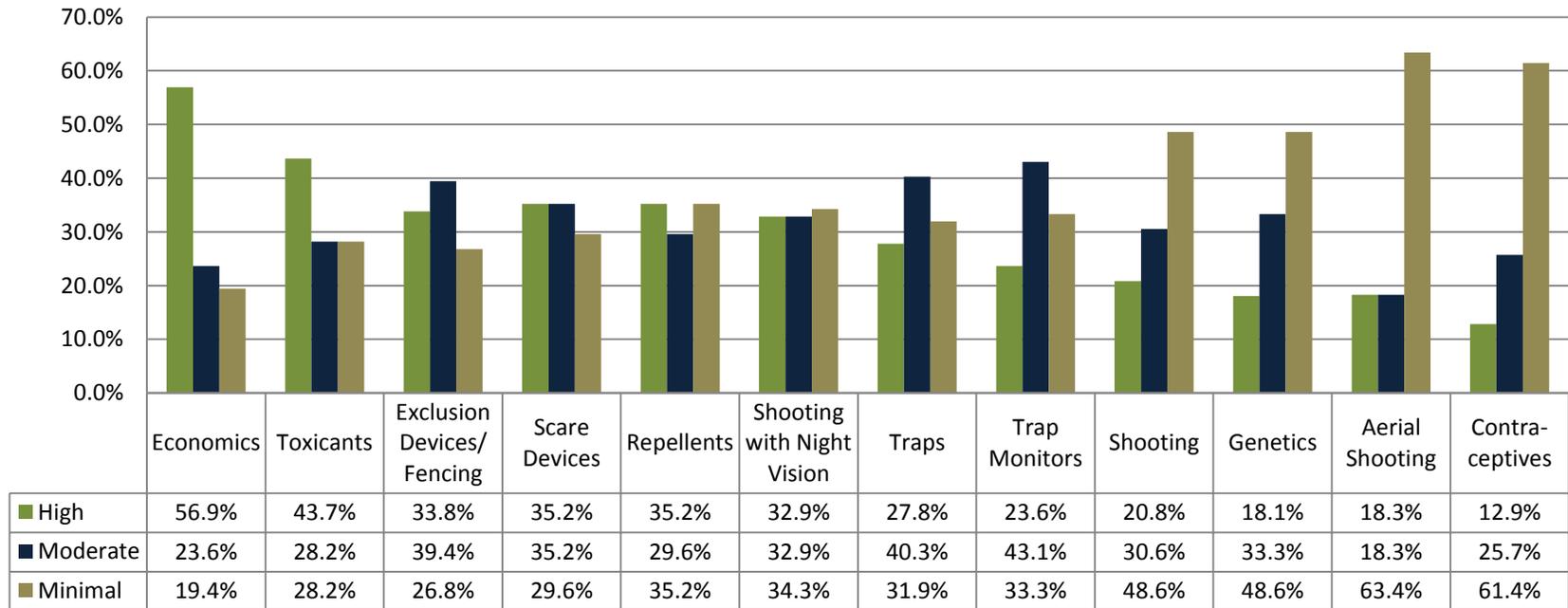


Figure 45: Summary of responses on the likely need for research into predator management

Between 70 and 72 respondents answered this question. In general, Operations believed there was a higher need for lethal control options like toxicants and all types of shooting. Research favored scare devices, repellents, and contraceptives. Both had similar views on repellents and traps. On the pure research side, Operations favored economics while Research favored genetics. The topics are broken into two graphs on the next page for easier viewing.

2011 Research Needs Assessment

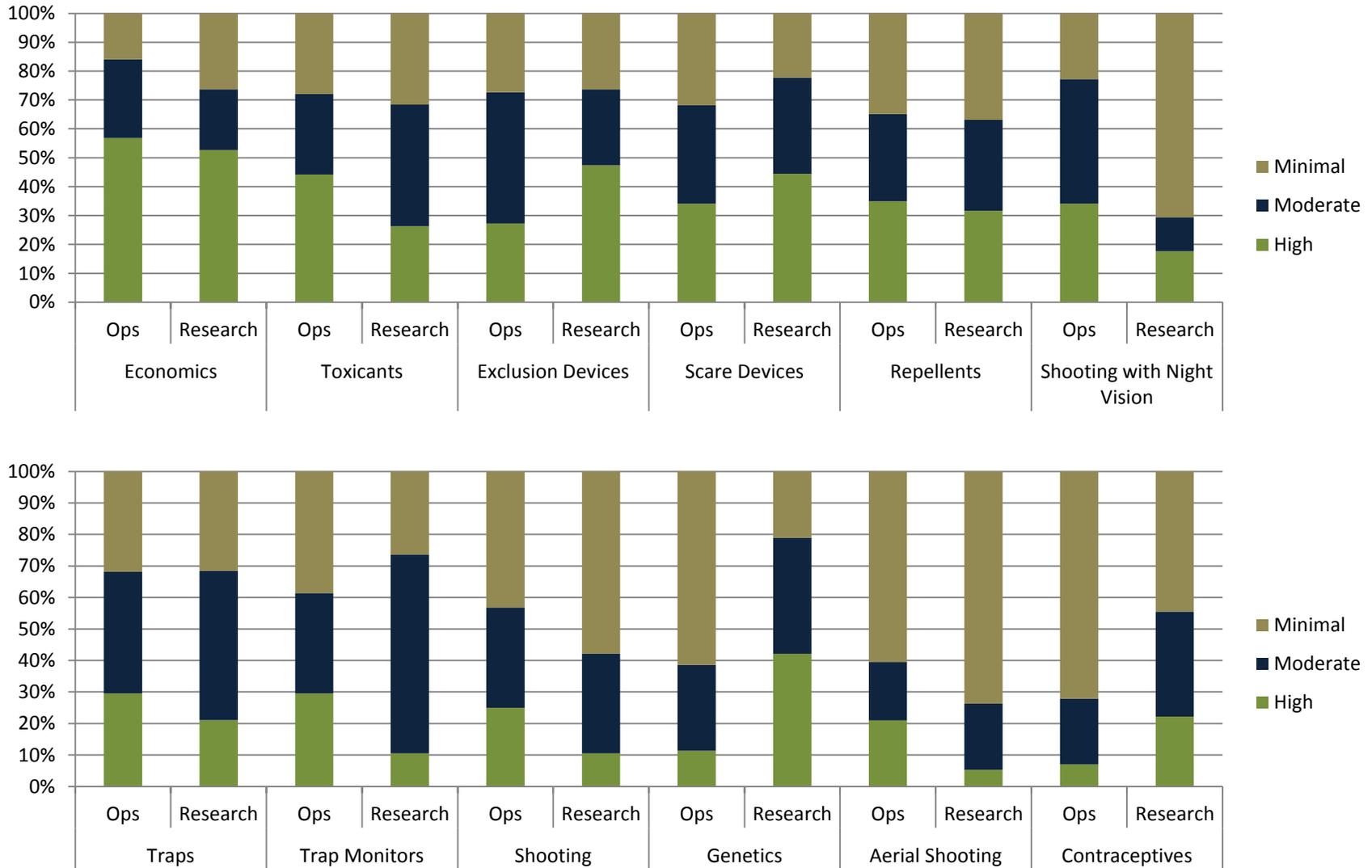


Figure 46: Perceived need for research into predator management, broken down by Operations and Research

Need for Bird Management Research

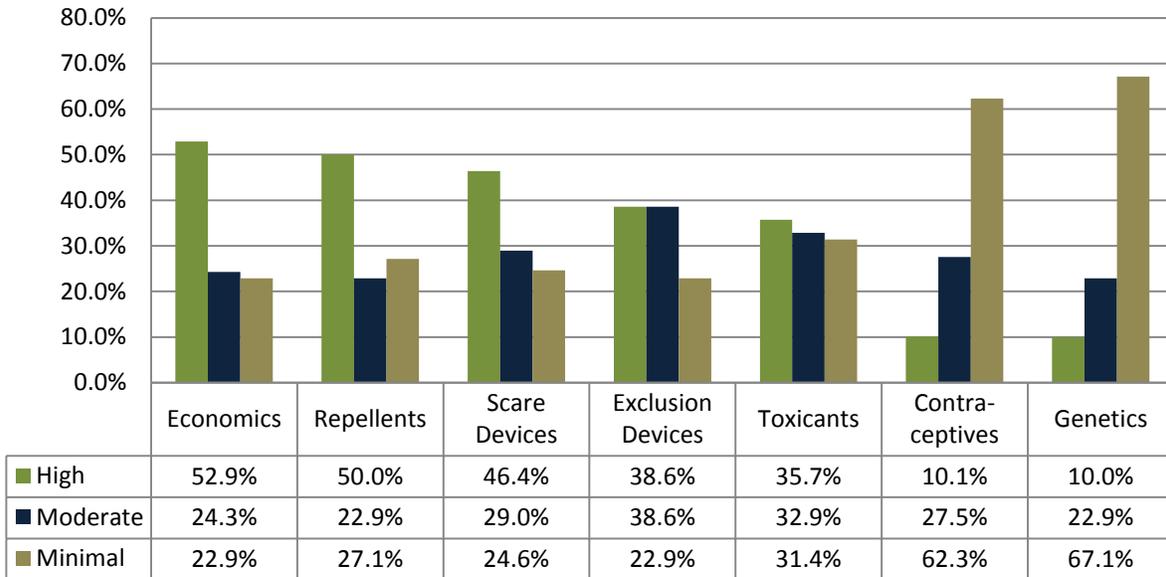


Figure 47: Summary of responses on the likely need for research into bird management

Between 69 and 70 respondents answered this question. Operations perceived more of a need for all bird management research topics except for contraceptives and genetics.

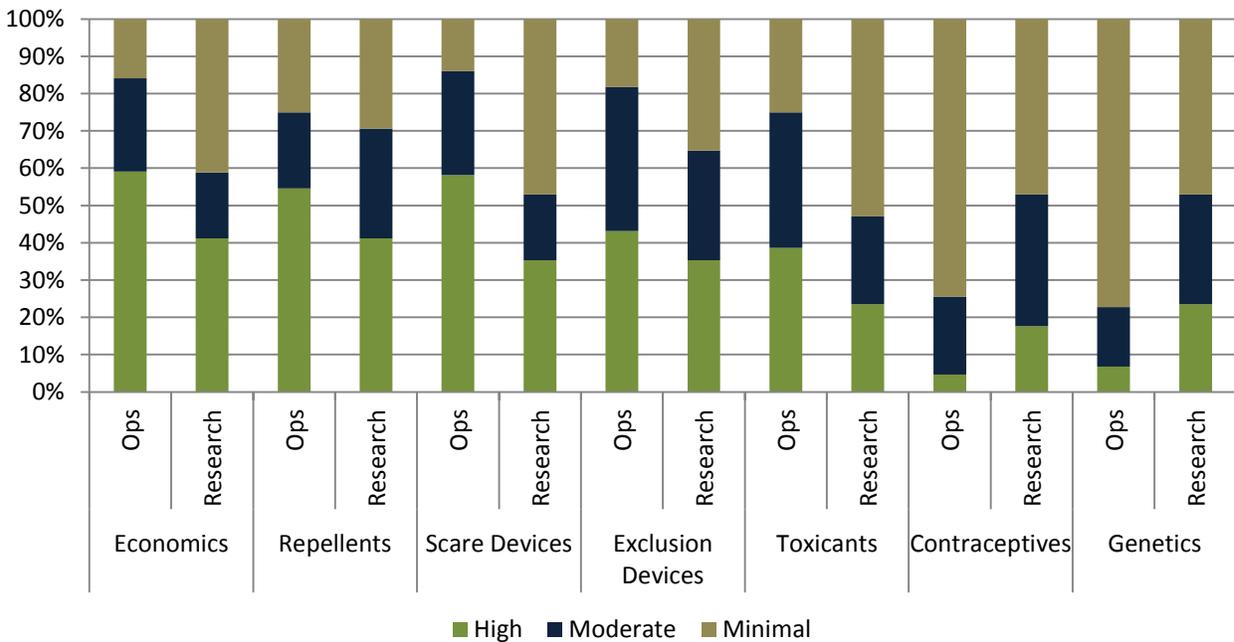


Figure 48: Perceived need for research into bird management methods, tools, and information, broken down by Operations and Research

Need for Deer Management Research

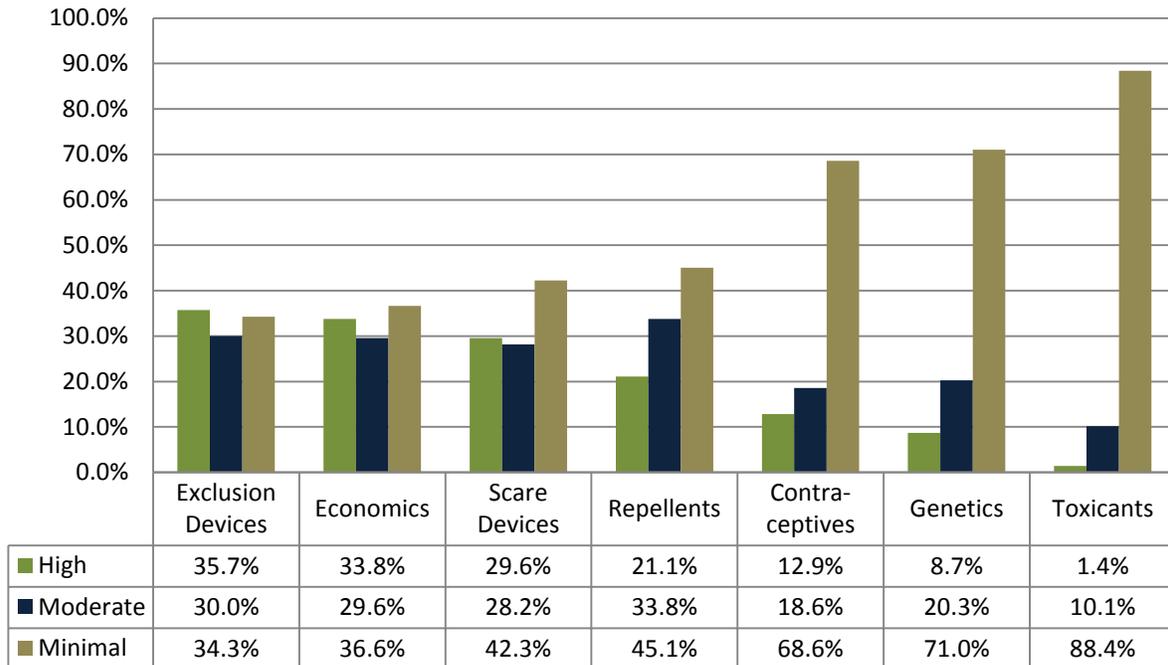


Figure 49: Summary of responses on the likely need for research into deer management

Between 69 and 71 respondents answered this question. Operations believed there would be a higher need for exclusion devices and repellents while Research perceived a higher need for economics, contraceptives, and genetics. Both had similar views on toxicants and scare devices.

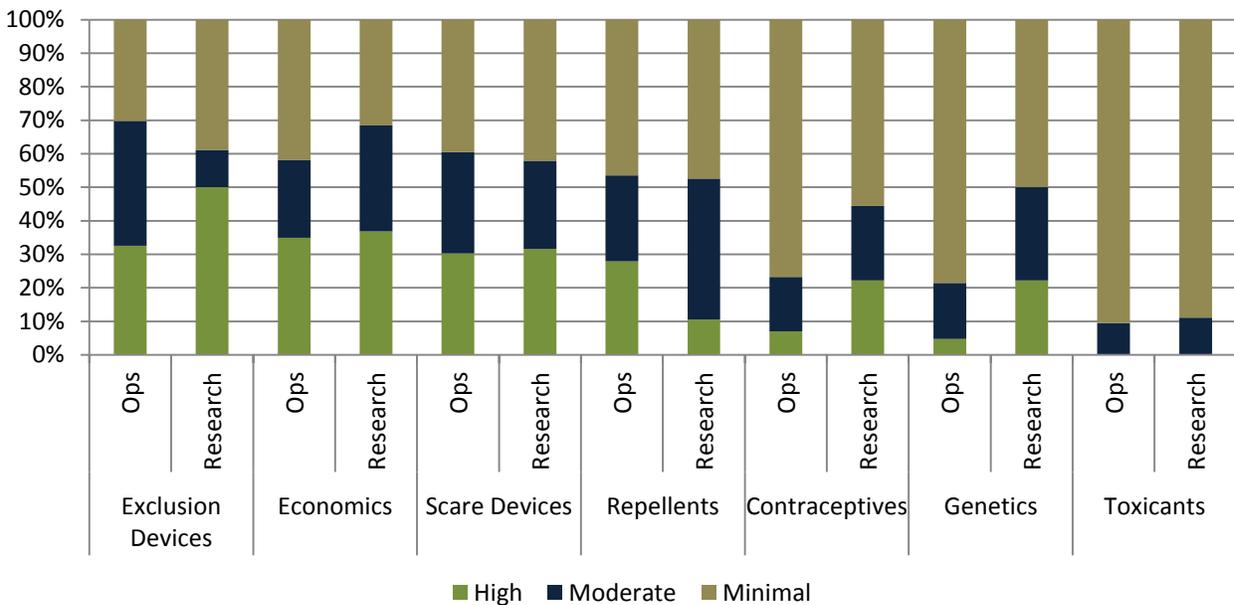


Figure 50: Perceived need for research into deer management, broken down by Operations and Research

Need for Rodent Control Research

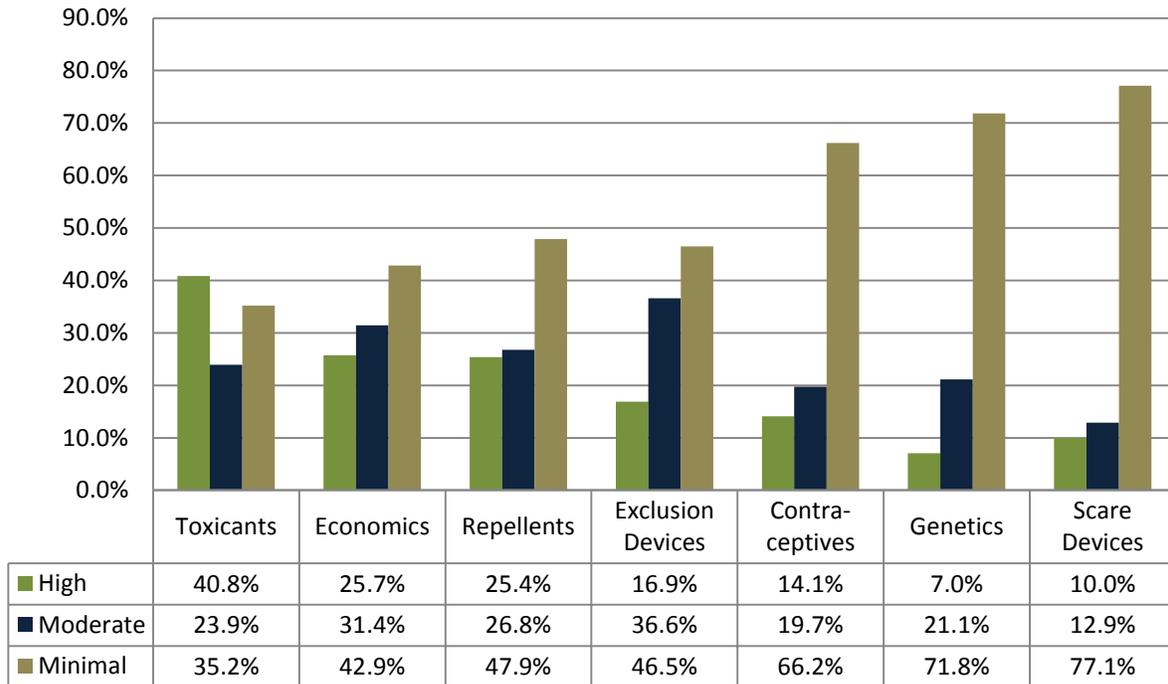


Figure 51: Summary of responses on the likely need for research into rodent control

Between 70 and 71 respondents answered these questions. Research believed there was a higher need for all rodent control research topics than Operations.

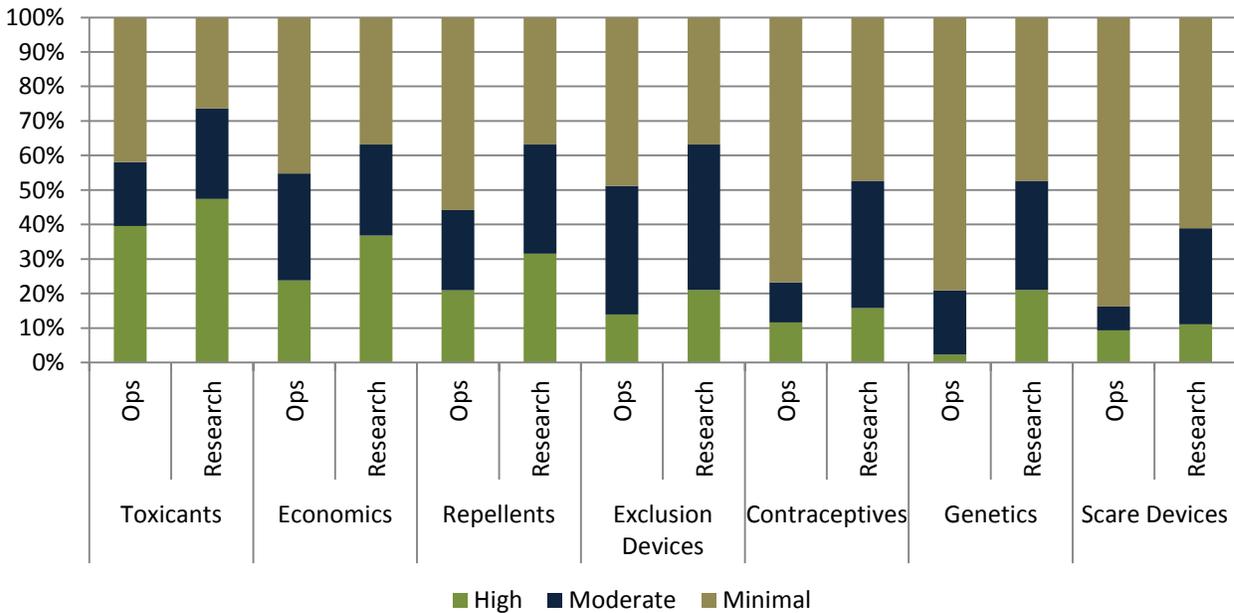


Figure 52: Perceived need for research into rodent control, broken down by Operations and Research

Need for Invasive Species Control Research

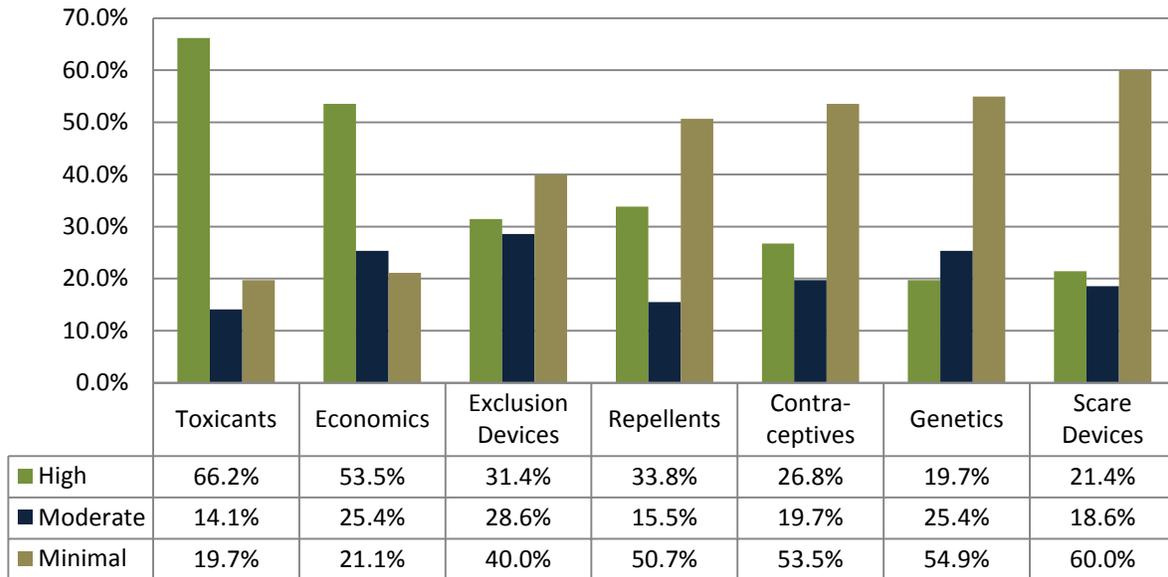


Figure 53: Summary of responses on the likely need for research into invasive species control

Between 70 and 71 respondents answered this question. Two people also believed there was a need to research traps for invasive species. Research believed toxicants, exclusion devices, contraceptives, and genetics were more important than Operations did. Operations and Research had similar views on the other topics.

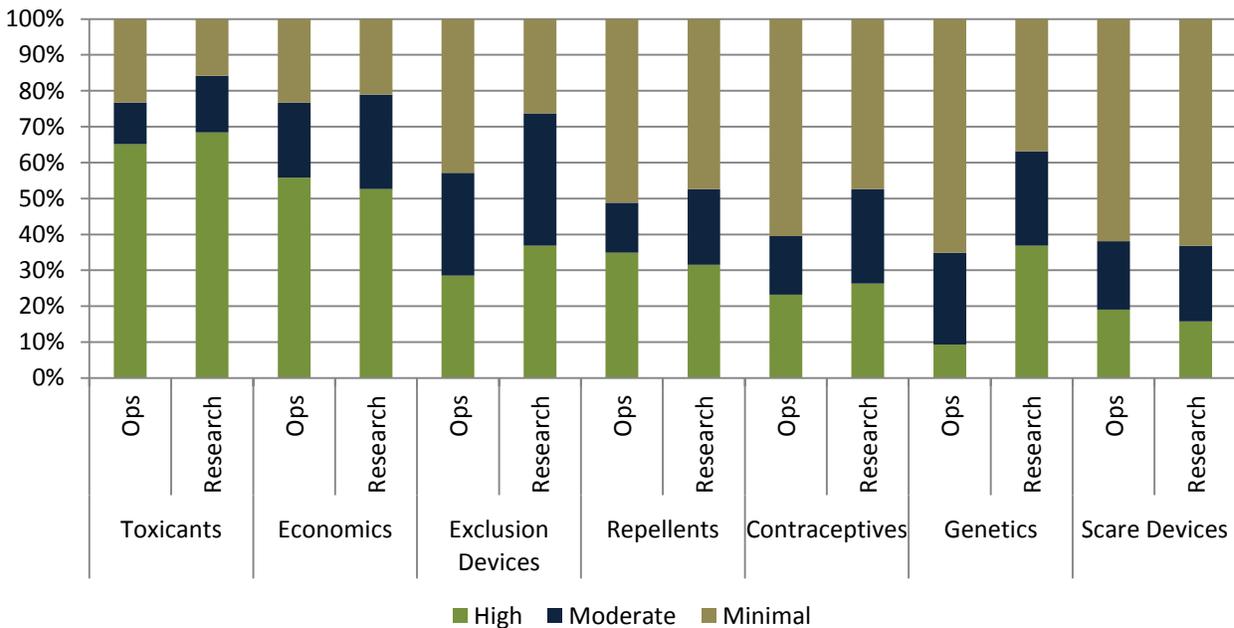


Figure 54: Perceived need for research into invasive species control, broken down by Operations and Research

Need for Reproductive Control Research

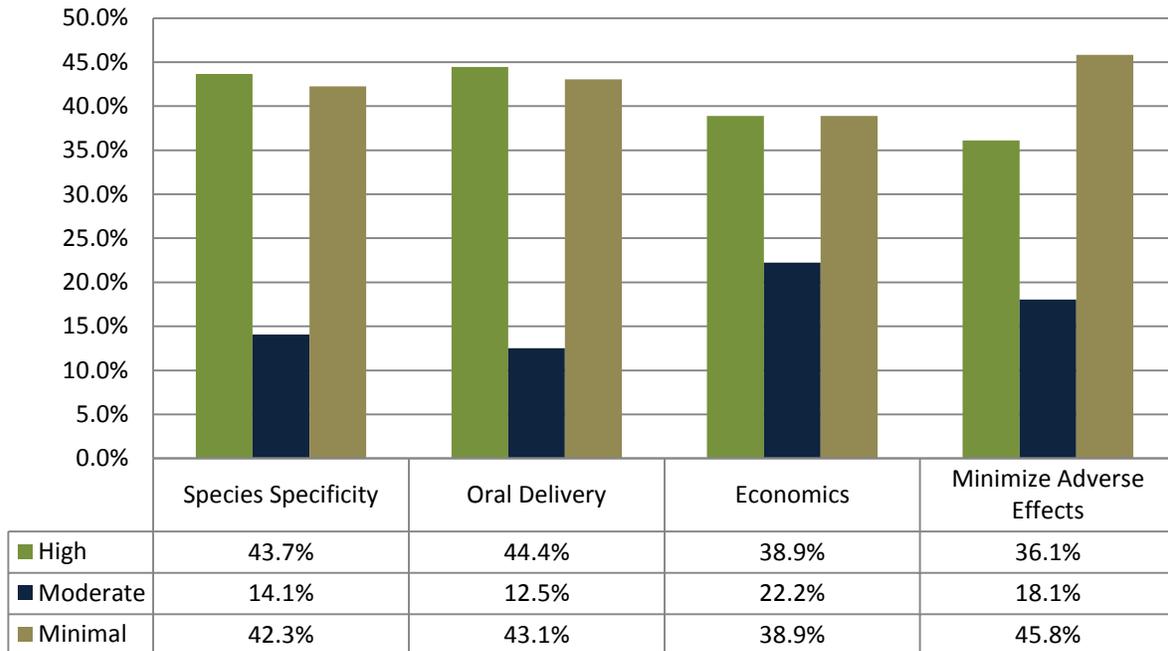


Figure 55: Summary of responses on the likely need for research into reproductive control

Between 71 and 72 respondents answered this question. Research believed there was a higher need for all reproductive control research topics than Operations.

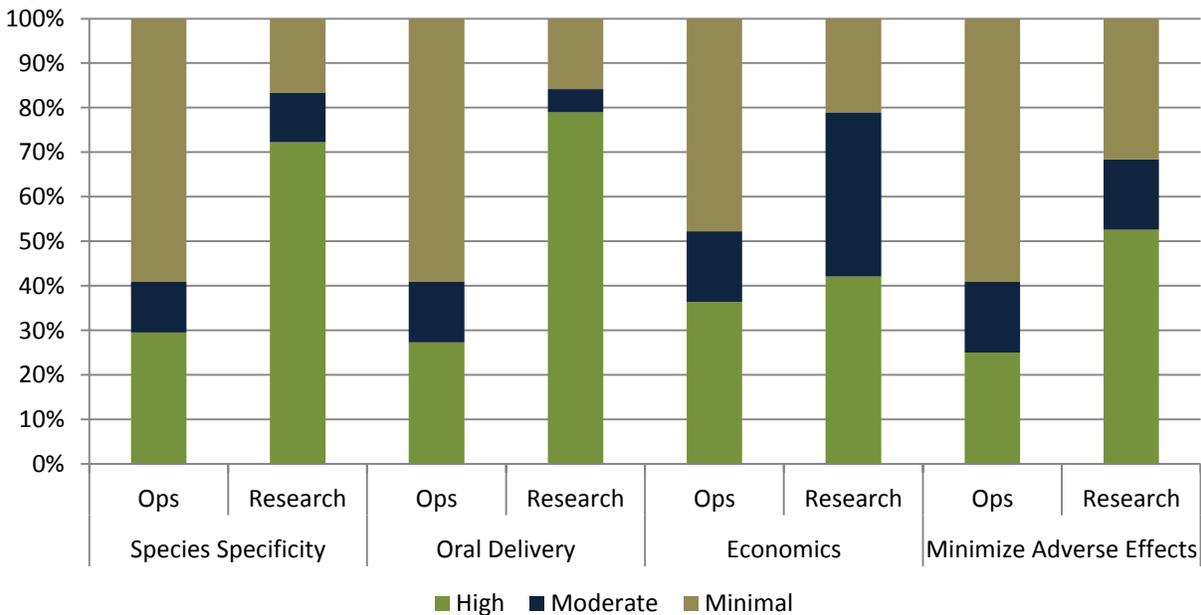


Figure 56: Perceived need for research into reproductive control, broken down by Research and Operations

Need for Wildlife Disease Management Research

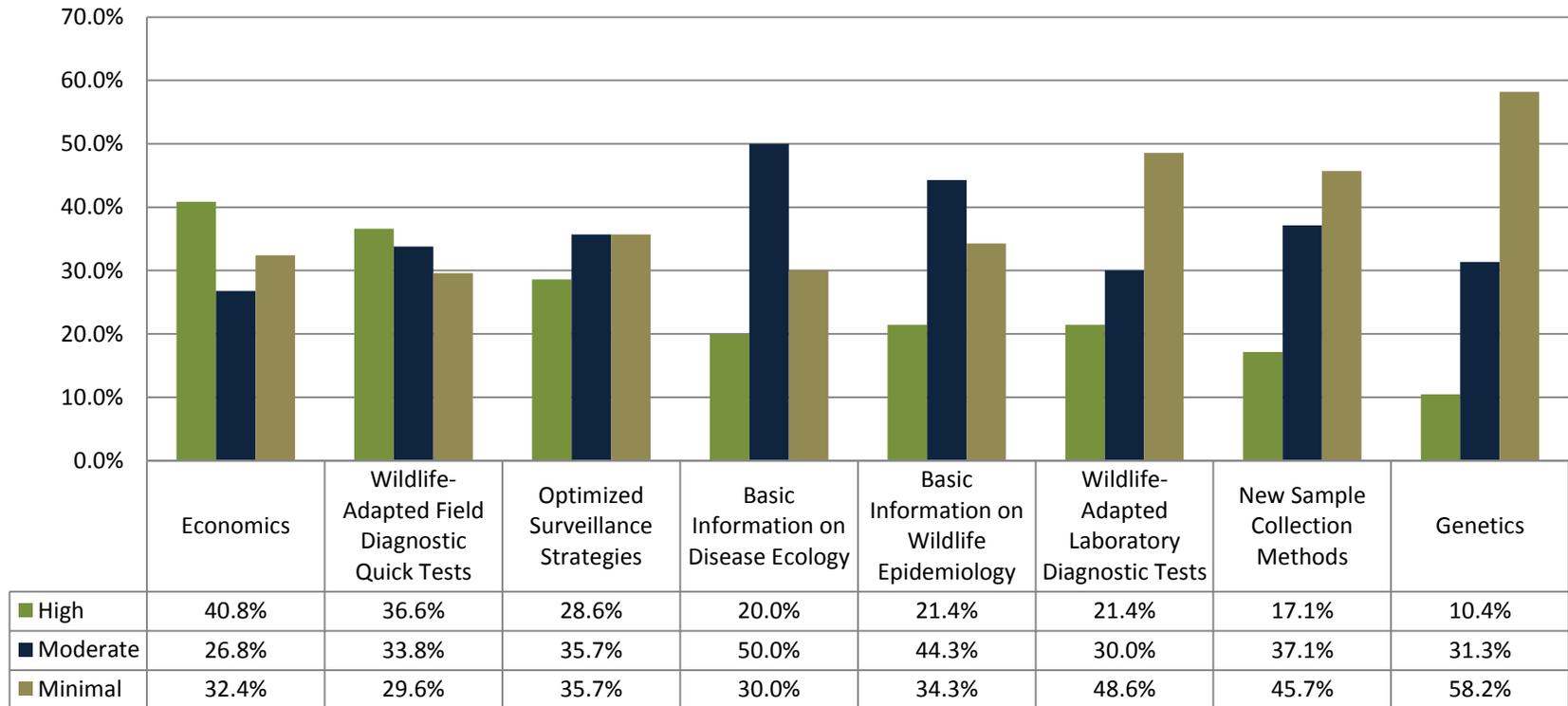


Figure 57: Summary of responses on the likely need for research into wildlife disease management

Between 67 and 71 respondents answered these questions. Operations had a higher need for wildlife-adapted field diagnostic quick tests. Research and Operations had similar views on the economics of wildlife disease management. Research had a higher need for all other topics.

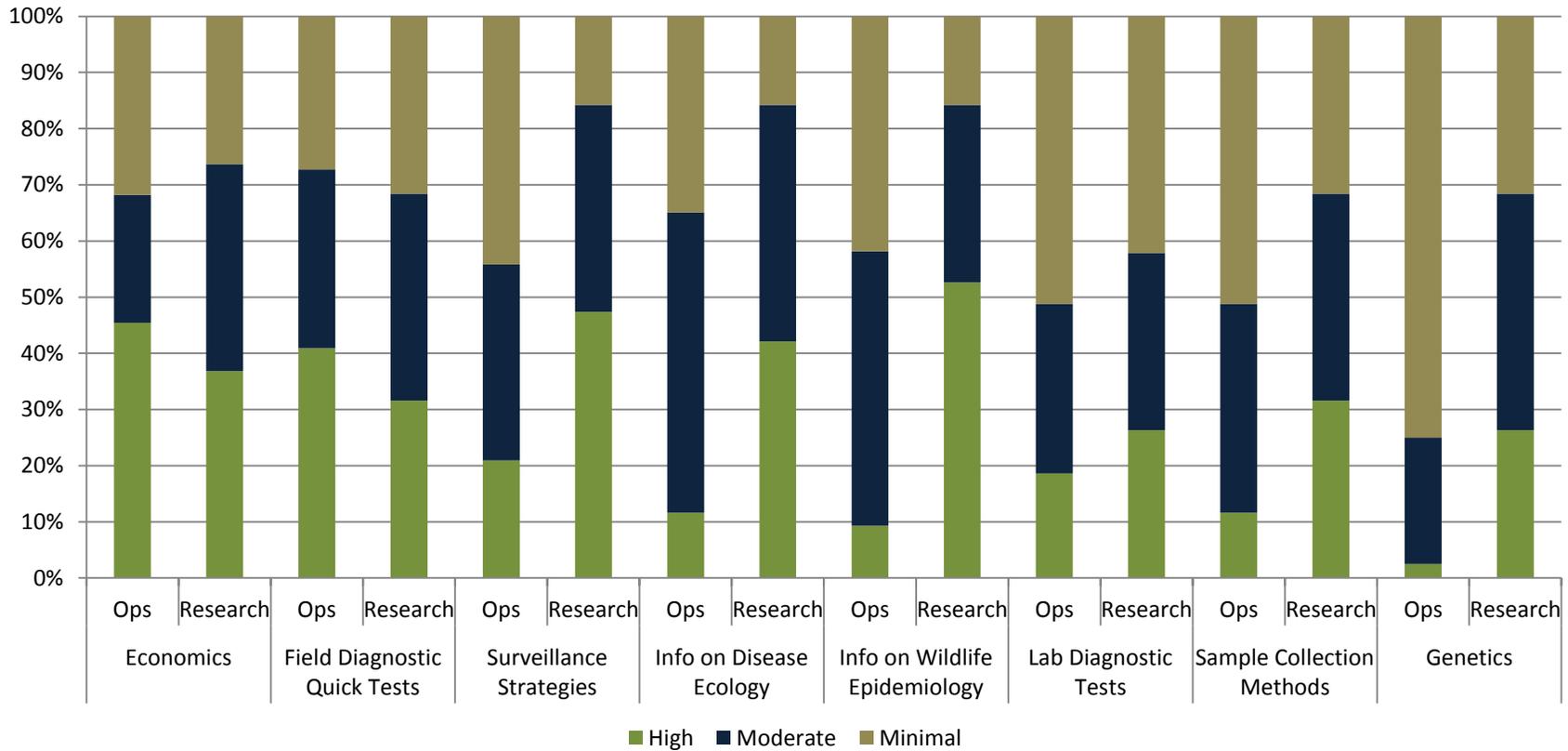


Figure 58: Perceived need for research into wildlife disease management, broken down by Operations and Research

Need for Wildlife Ecology & Population Biology Research

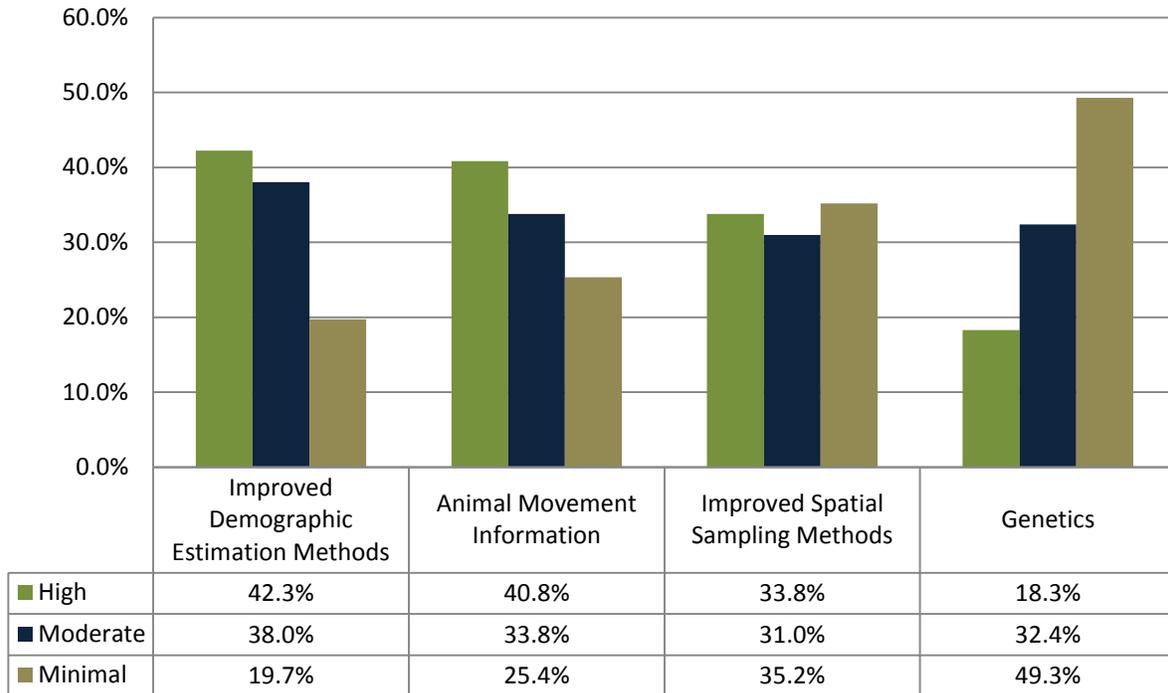


Figure 59: Summary of responses on the likely need for research into wildlife ecology & population biology

71 respondents answered these questions. Research believed there was a higher need for all wildlife ecology and population biology research topics than Operations.

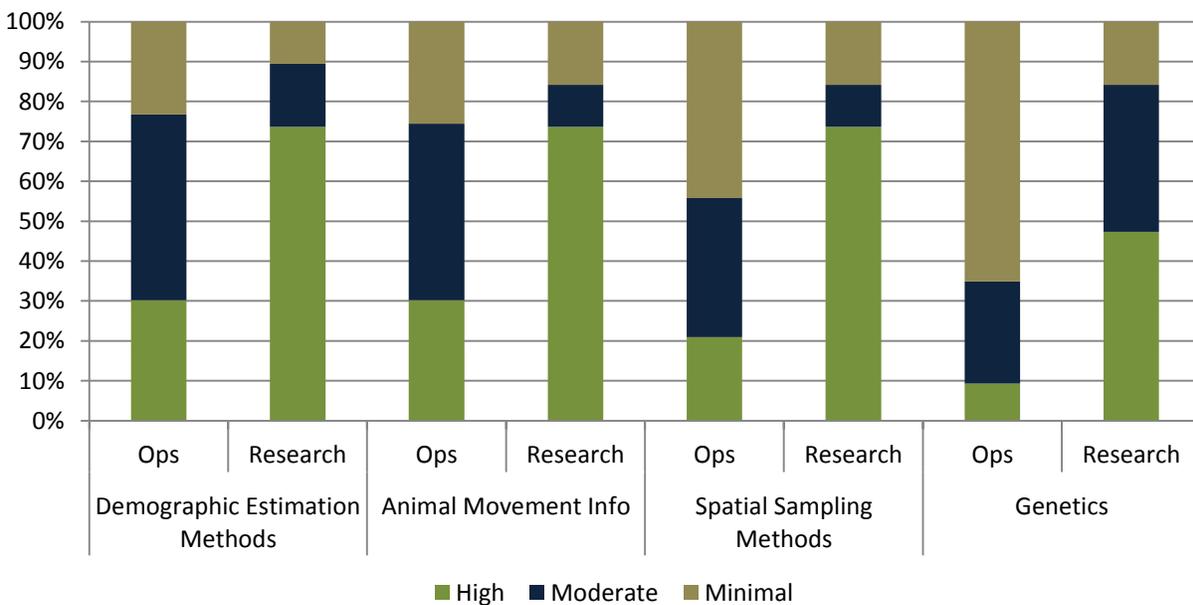


Figure 60: Perceived need for research into wildlife ecology & population biology

LIKELY FUTURE IMPORTANCE OF NWRC ACTIVITIES AND SERVICES

Respondents were asked to indicate the likely importance to their job over the next five years of various activities and services that the NWRC offers. They could rate each as “Highly Important,” “Moderately Important,” or “Minimally Important.”

Importance of NWRC Services

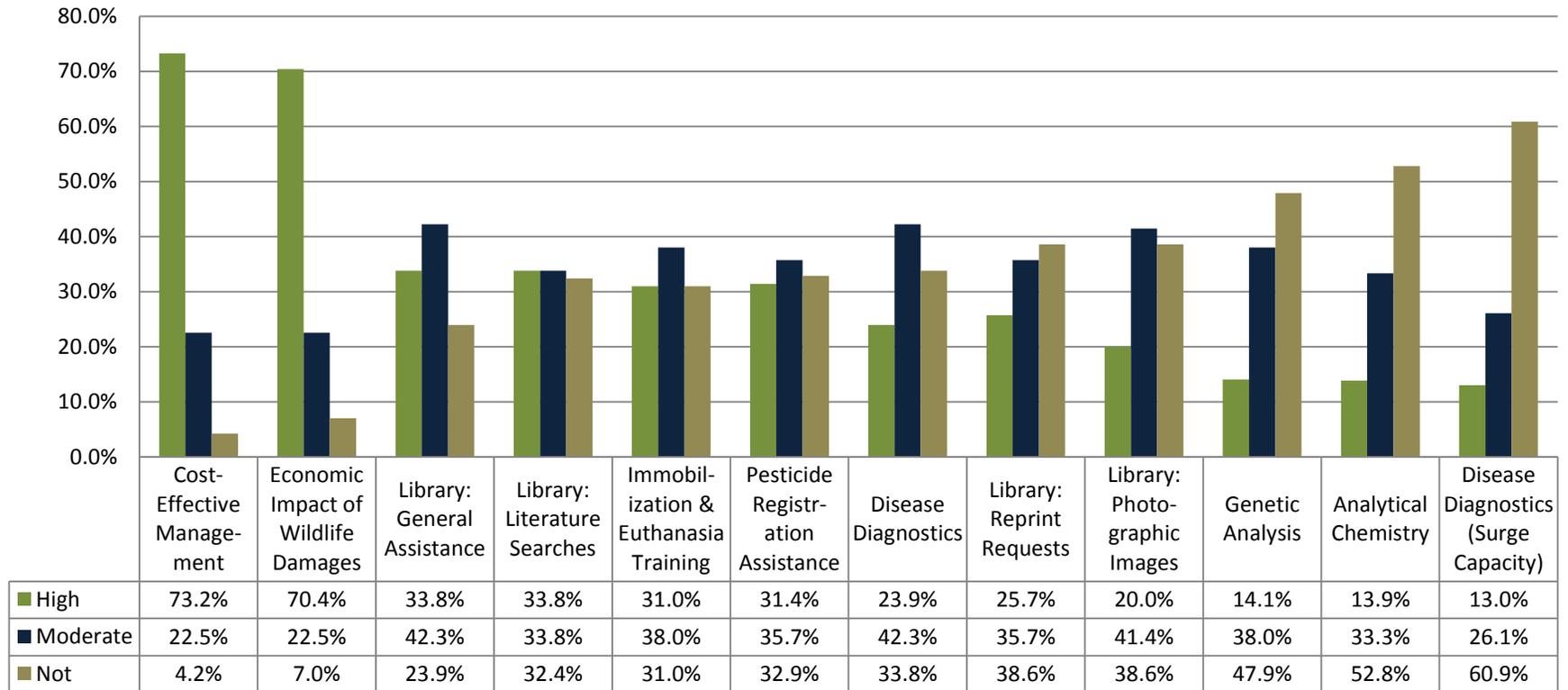


Figure 61: Summary of responses on the importance of services offered by the NWRC

Between 69 and 72 respondents answered these questions. All services were considered more important in the West except for genetic analysis and immobilization & euthanasia training, which were considered more important at the NWRC.

Importance of NWRC Consultations

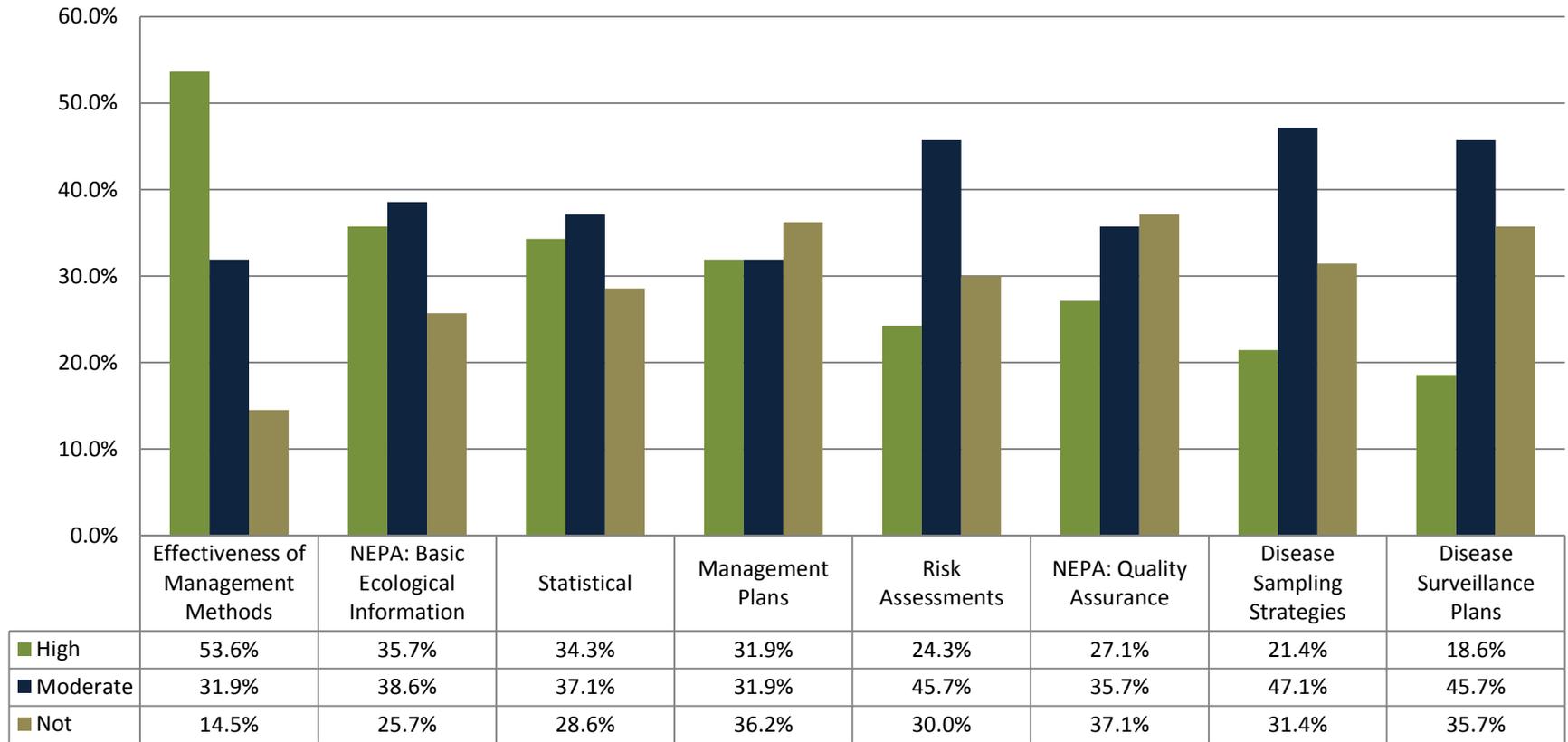


Figure 62: Summary of responses on the importance of consultations offered by the NWRC

Between 69 and 70 respondents answered these questions. All consultations were considered more important in the West except for the effectiveness of management methods, statistical consultations, and management plans, which were considered more important by the NWRC.

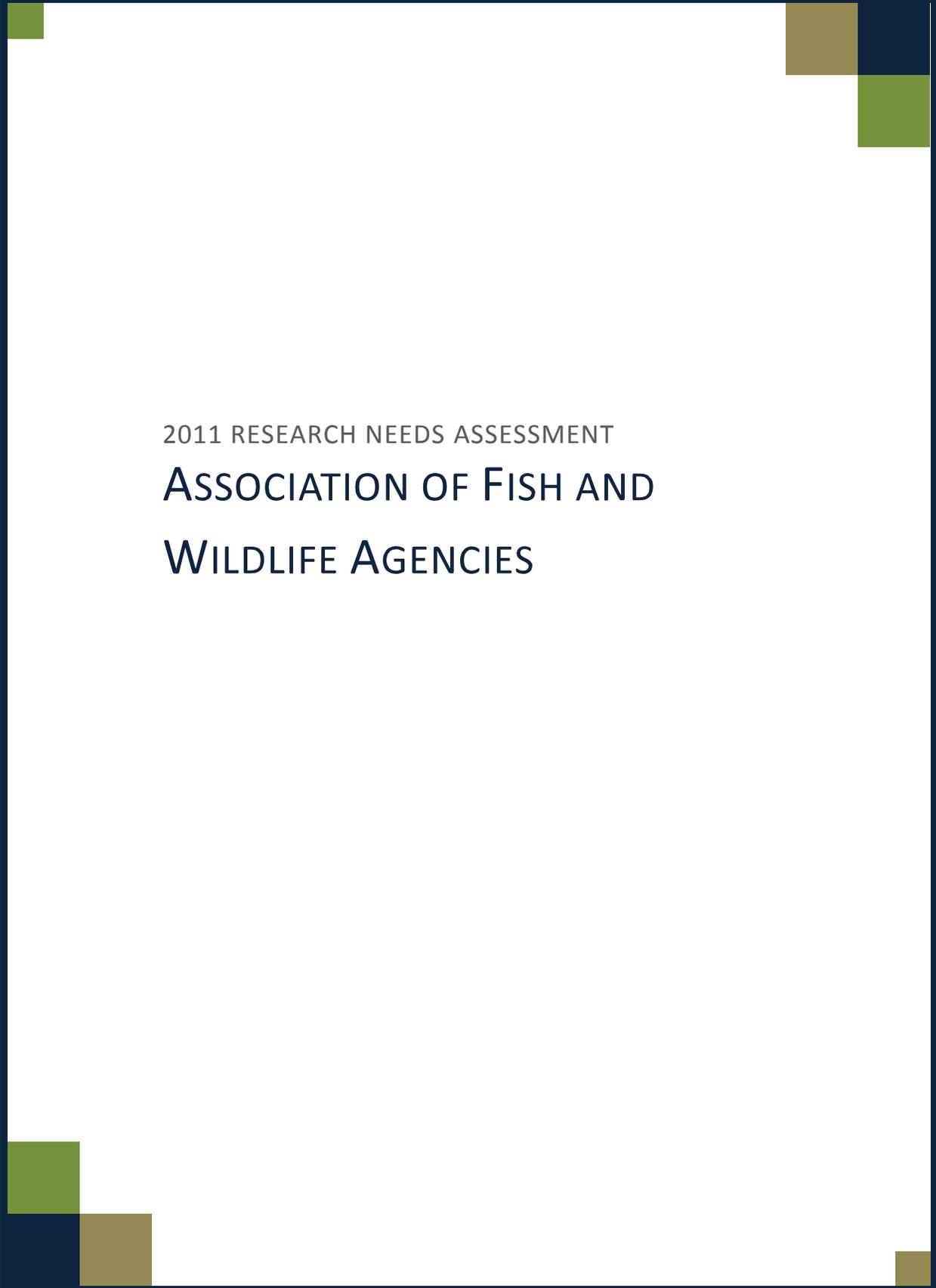
CONCLUSIONS

In terms of research needs, invasive species, specifically feral swine, were one of the biggest concerns. Predation was also a major topic of interest, especially in the Western Region. Non-lethal control methods were requested repeatedly and many people also requested economic analyses and gave economic assessments a high priority. According to comments in the free response section of the survey, many people need proof that their organization or program is economically justified in these times of lean funding. Aquaculture protection, human safety protection, property protection, vaccines, and repellents were seldom requested.

There were a few notable differences between the Operations and Research respondents within WS. Genetics and reproductive control were much more important to Research than Operations. Research into rodent control and wildlife ecology & population biology were in general slightly more important to Research. Operations found wildlife damage to forestry, vegetables, and aquaculture relatively more important. Aviation safety was more important to Operations while automobile safety was more important to Researchers.

Several regional differences were also expressed in the WS survey. Livestock predation was a much bigger concern in the Western Region than the Eastern Region, especially as pertaining to cows and sheep. Livestock in general were more important in the West, but in topics concerning predators the difference was the largest and predation management was thus a bigger concern. The Western Region professed a higher need for research into lethal predator control options like toxicants and shooting. Game animals were also considered more important in the Western Region, with wildlife impacts on big game, waterfowl, and upland birds receiving higher ratings relative to the Eastern Region. Cormorants, feral swine, and deer were animals that the Eastern Region rated of higher concern. Western respondents placed more importance on the services and consultations offered by the NWRC.





2011 RESEARCH NEEDS ASSESSMENT
**ASSOCIATION OF FISH AND
WILDLIFE AGENCIES**

BACKGROUND

State natural resources directors, through the Association of Fish and Wildlife Agencies (AFWA), requested the opportunity to be involved in the WS program's RNA process. In early March 2011, AFWA sent invitations to participate to the Fish and Wildlife Chiefs. By April 8th, 31 replies had been received.

The survey was similar to the one sent throughout WS, consisting of five demographic questions, a free-response section, and 31 multiple choice questions about human-wildlife conflicts and NWRC services. However, respondents were asked to identify only one top research need and the multiple choice questions could only be analyzed as referring to overall conflicts, not specific animals within each conflict. A copy of this survey can be found in Appendix B.

The two surveys were not directly comparable and were analyzed separately. Due to a formatting error in the AFWA survey, the first choice of each multiple choice response was separated into two different choices (e.g. instead of choosing "Highly Important," participants could choose either "Highly" or "Important").

DEMOGRAPHICS

For the AFWA survey, 31 people responded. Of these, 55% worked for state Fish & Wildlife Agencies. The rest of the respondents chose the "other" category and specified a different place of employment. This included the National Animal Welfare and Protection Organization, ranches, the private aquaculture industry, and universities. Of the respondents, 52% were managers and 36% were executives. Three surveys were also received from biologists and one from a research grade scientist.

Of the AFWA respondents, 74% were between 41 and 59 years old, 19% were 60 or older and the remainder were between 25 and 40. No respondents were under 25.

Thirty of the respondents supplied their ZIP code. The given codes were each correlated with US States. See Figure 63. Surveys were received from California, Washington state, Idaho, Wyoming, Colorado, Arizona, New Mexico, Texas, Arkansas, Louisiana, Georgia, South Carolina, North Carolina, West Virginia, Ohio, New York, New Hampshire, Michigan, Minnesota, and North Dakota. One of the respondents commented that their work included national purview.

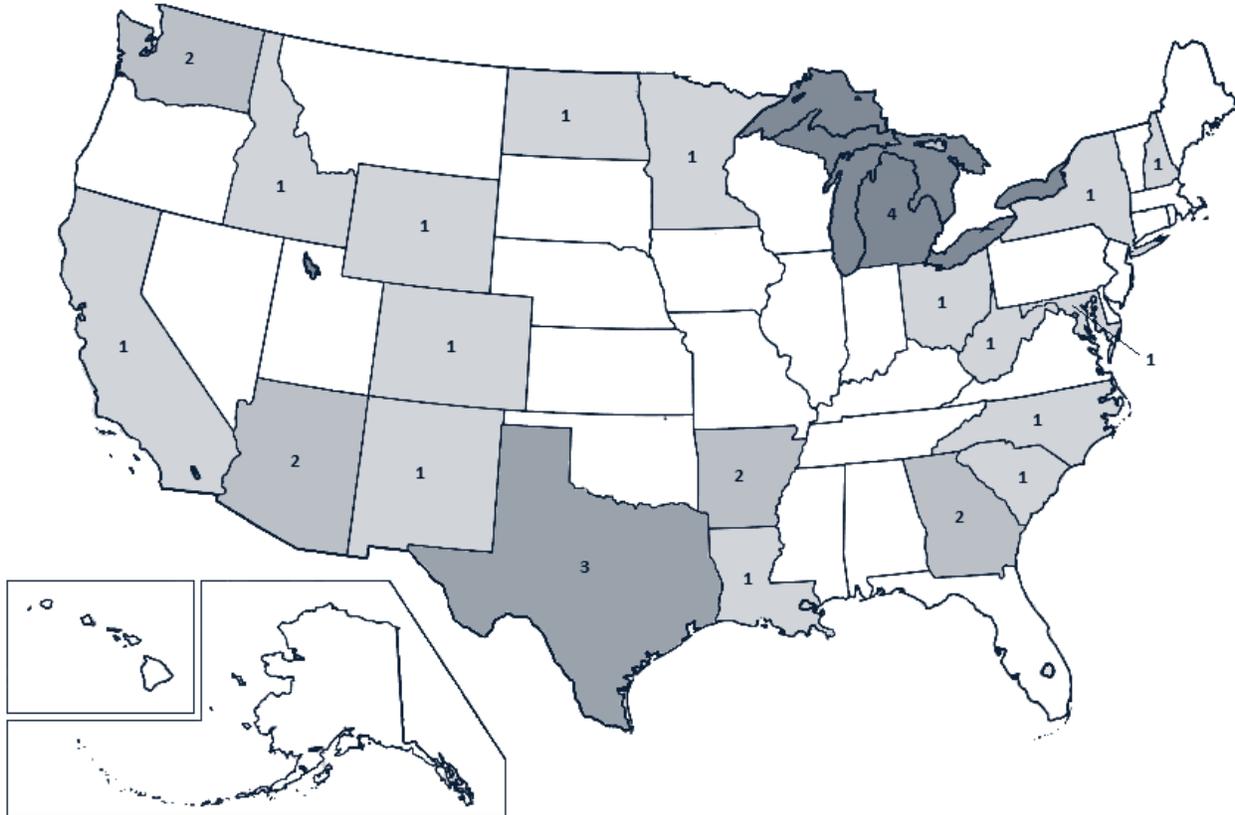


Figure 63: Map showing the number of AFWA surveys received from each state

TOP RESEARCH NEED

Respondents were asked to describe their top research need and 22 research needs were described. The free response data from the AFWA survey was analyzed in the same manner as the WS internal survey (See pages 9-11).

Table 4: Number of AFWA research requests by broad problem area

| Broad Problem Area | |
|-----------------------------|---|
| Aquaculture Protection | 1 |
| Crop Protection | 2 |
| Disease-Other | 3 |
| Disease-Rabies | 2 |
| General Damage Management | 2 |
| Invasive Species | 6 |
| Misc. | 4 |
| Natural Resource Protection | 2 |
| Predation | 4 |

Table 5: Number of AFWA research requests by research needed and animal

| Research Needed | | Animal | |
|---------------------------|----|-------------|---|
| Damage Analysis | 1 | Feral Swine | 4 |
| Damage Management Methods | 13 | Bear | 2 |
| Delivery System | 2 | Cormorant | 2 |
| Ecological Information | 2 | Coyote | 2 |
| Economic Assessment | 1 | Deer | 2 |
| Evaluation | 1 | Beaver | 1 |
| Genetics | 1 | Blackbirds | 1 |
| Other Research | 1 | Canids | 1 |
| Population Control | 2 | Feral Dogs | 1 |
| Population Modeling | 3 | Moose | 1 |
| Repellent | 1 | Rabbits | 1 |
| Surveillance Method | 1 | Rodents | 1 |
| Toxicant | 1 | Skunks | 1 |
| Vaccine | 2 | | |

MULTIPLE CHOICE QUESTIONS

The survey contained five multiple choice questions. Due to a formatting error, the first category of each multiple choice response was separated into two different columns (e.g. instead of choosing “Highly Important,” participants could choose either “Highly” or “Important”).

Respondents were asked to indicate the likely importance of areas of human-wildlife conflict in their state or region over the next five years in terms of impact on production, economics, human health, human safety, and property damage. They could rate each conflict area “Highly,” “Important,” “Moderately Important,” or “Minimally Important.” Response rate varied between 18 and 26 people per question in this portion of the survey.

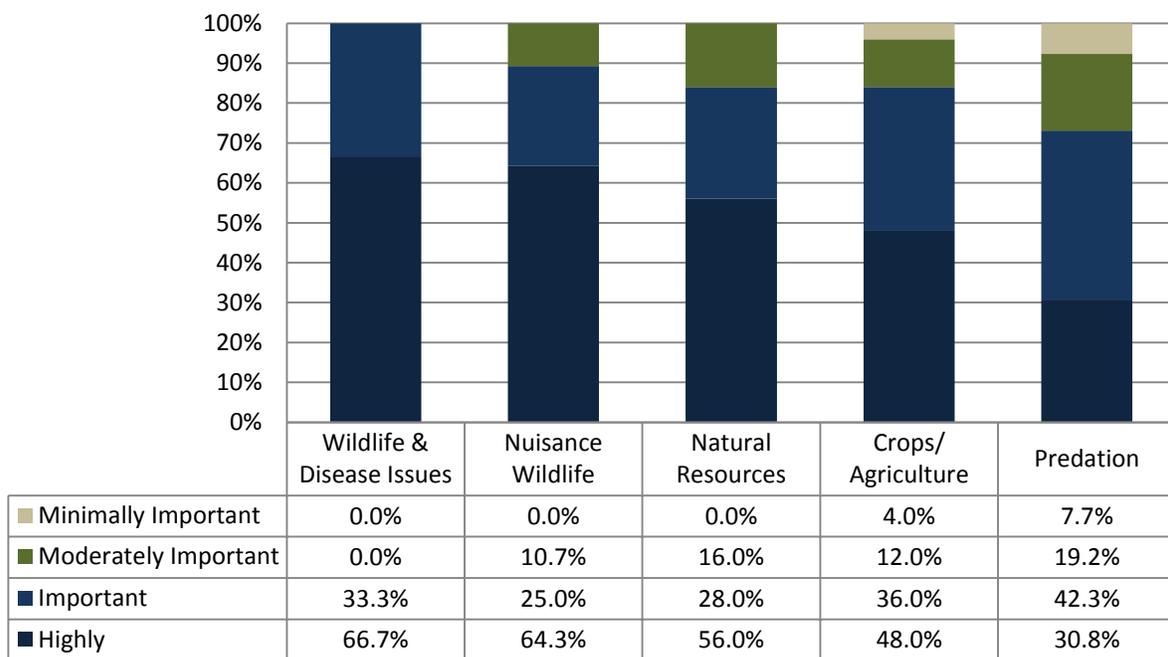


Figure 64: Summary of AFWA responses on the importance of different human-wildlife conflict areas

Respondents were asked to indicate their likely involvement in areas of human-wildlife conflict in their state or region during the next five years. They could rate their involvement as “Major,” “Involvement,” “Moderate Involvement,” or “Minimal Involvement.” The data is divided into two graphs on the next page for easier viewing. Between 20 and 29 people answered each question in this portion of the survey.

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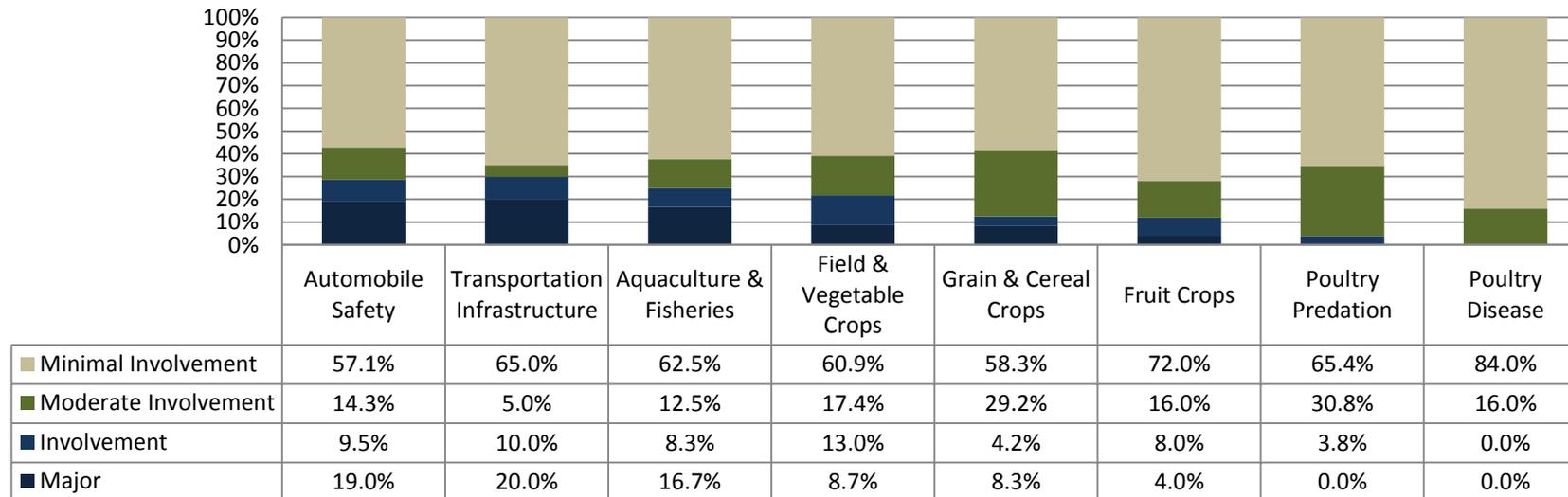
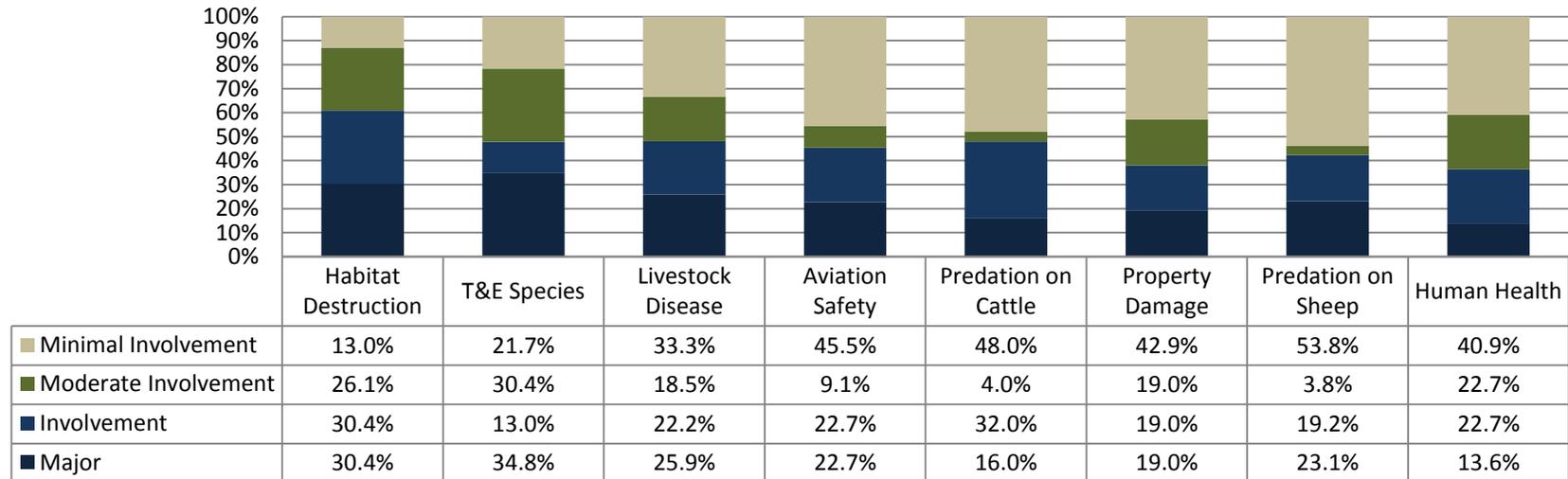


Figure 65: Summary of AFWA responses on involvement with different human-wildlife conflicts

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Respondents were asked to indicate the likely level of need in their state or region over the next five years for research to develop, improve, and/or evaluate various methods, tools, or information. They could rate each as a “High,” “Need,” “Moderate Need,” or “Minimal Need.” Between 20 and 29 people answered this portion of the survey.

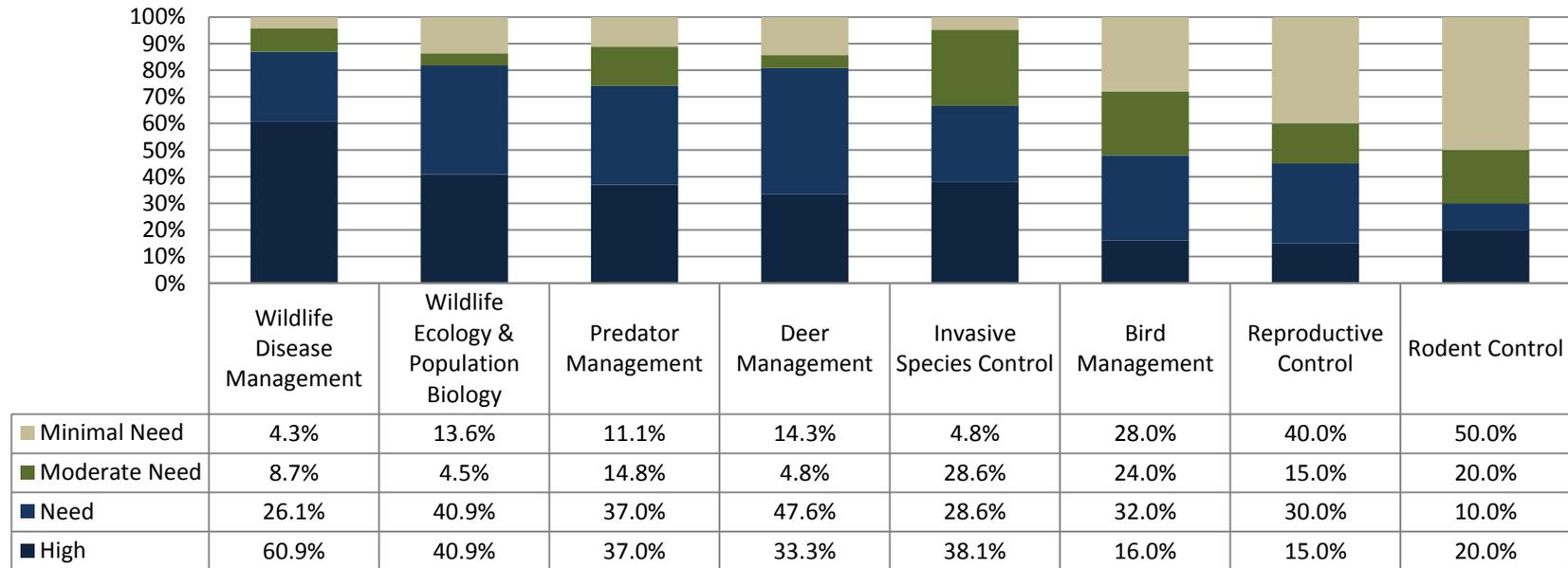


Figure 66: Summary of AFWA responses on the need for research on human-wildlife conflicts

Respondents were asked to indicate the likely importance to their job over the next five years of various activities and services that the NWRC offers. They could rate each as “Highly,” “Important,” “Moderately Important,” or “Minimally Important.” The data is divided into two graphs on the next page for easier viewing. Between 19 and 31 people answered this portion of the survey.

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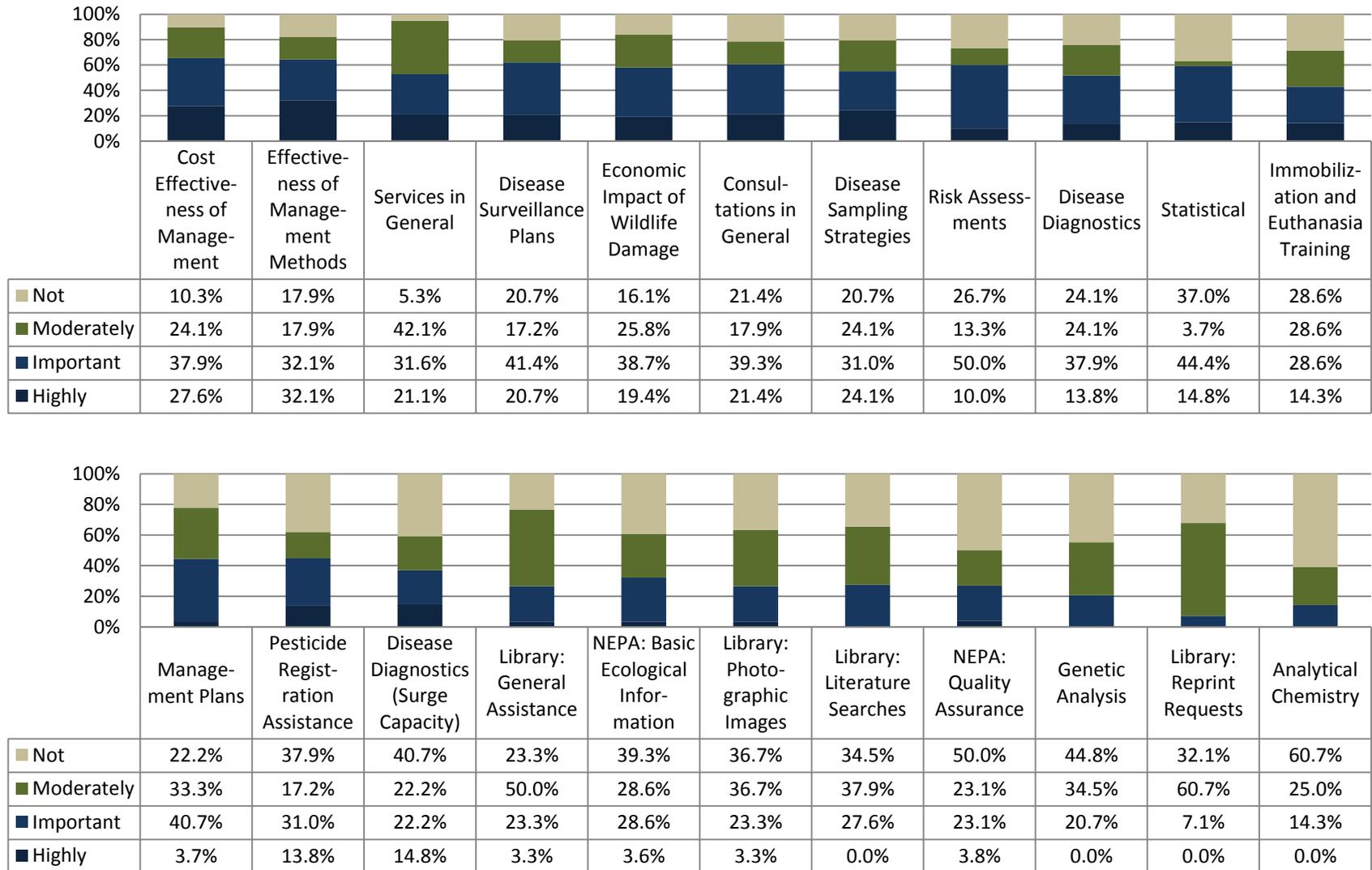


Figure 67: Summary of AFWA responses on the importance of NWRC services and consultations

REFERENCES

Clark, L., D. Nelsony, and K. Gustadz, 2007 "USDA/APHIS/Wildlife Services Research Needs Assessment 2006" USDA/APHIS/WS National Wildlife Research Center Staff Publications. 18 pages.

Buggers et al. 2002. Wildlife damage management research needs: perceptions of scientists, wildlife managers, and stakeholders of the USDA/Wildlife Services program. *International Biodeterioration & Biodegradation* 49:213-223

Packham and Connolly, 1992, "Control methods research priorities for Animal Damage Control", Proc 1.5" Vertebrate Pest Conference, J.E. Borrecco and R. E. Marsh eds., Pp 12- 15.

USDA, 2011 "National Wildlife Research Center (NWRC)"
http://www.aphis.usda.gov/wildlife_damage/nwrc/about/about.shtml Accessed July 13th, 2011

APPENDIX A: COPY OF THE WILDLIFE SERVICES QUESTIONNAIRE

The National Wildlife Research Center (NWRC) is the research arm of the USDA Animal and Plant Health Inspection Service (APHIS), Wildlife Services program. Scientists at the NWRC conduct research to develop and evaluate tools and information to resolve conflicts between humans and wildlife. To help establish research priorities at the NWRC, the Wildlife Services Deputy Administrator requests feedback from the program and its stakeholders every 5 years. This feedback helps to determine the NWRC’s research focus, hiring priorities, and resource allocation. **Thus, your participation in this process is very important, and we value your feedback. Please take 15 minutes to complete the following assessment.**

Thank you in advance for taking the time to complete this research needs assessment.

Please identify your current employment status.

| I am employed by: | |
|---|---|
| <input type="radio"/> APHIS-Wildlife Services-Operations | <input type="radio"/> National Park Service |
| <input type="radio"/> APHIS-Wildlife Services-NWRC | <input type="radio"/> U.S. Fish and Wildlife Service |
| <input type="radio"/> APHIS-Veterinary Services | <input type="radio"/> U.S. Geological Survey |
| <input type="radio"/> APHIS-Biotechnology Regulatory Services | <input type="radio"/> Bureau of Land Management |
| <input type="radio"/> APHIS-Plant Protection & Quarantine | <input type="radio"/> National Oceanic and Atmospheric Administration |
| <input type="radio"/> APHIS-Animal Care | <input type="radio"/> Department of Defense |
| <input type="radio"/> Agricultural Research Service | <input type="radio"/> Other |
| Define Other: | |

| Which of the following best describes your principal job: | |
|---|---|
| <input type="radio"/> Executive (SES) | <input type="radio"/> WS State Director |
| <input type="radio"/> Manager | <input type="radio"/> WS Assistant State Director |
| <input type="radio"/> Research Grade Scientist | <input type="radio"/> WS District Supervisor |
| <input type="radio"/> Biologist | <input type="radio"/> Technician |
| Other (Define): | |

What is your work zip code? _____

| Which of the following best describes your age? |
|---|
| <input type="radio"/> 18-24 years |
| <input type="radio"/> 25-40 years |
| <input type="radio"/> 41-59 years |
| <input type="radio"/> 60 years or more |

What do you anticipate to be your top 3 research needs/priorities, in order of importance (1 = most important), during the next 5 years to address human-wildlife conflicts in your state or region? Give a brief description of the problem, background on the magnitude and/or location of the problem, and how research could assist in management of the problem.

1. _____

2. _____

3. _____

Importance of different areas of human-wildlife conflict

Wildlife damage management involves various types of conflict. Please indicate the likely importance of each of the following areas of conflict **in your state or region** during the next 5 years in terms of impact on production and/or economics, human health and safety, property damage, etc.

| Nature of conflict | Extremely important | Moderately important | Minimally important |
|--------------------------|-----------------------|-----------------------|-----------------------|
| Predation | | | |
| Cattle | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Sheep | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Swine | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Goats | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Poultry | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Furbearers (farm raised) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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| | | | |
|--------------------------------------|-----------------------|-----------------------|-----------------------|
| Other (specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Crops/Agriculture | | | |
| Fruits/Nuts | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Grains & cereals | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Forage crops/Pasture | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Seeds | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Vegetables | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Forestry | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Aquaculture | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (specify): | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Wildlife & Disease Issues | | | |
| Dairies | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feedlots | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Public health | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Wildlife health | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Poultry | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Livestock | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Natural Resources | | | |
| T&E species | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Sport fisheries | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Big game | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Upland birds | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Waterfowl | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Invasive species | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Miscellaneous | | | |
| Nuisance wildlife | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Property | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Golf courses/Turf | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Aviation safety | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Automobile safety | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Transportation infrastructure | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (specify): | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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Involvement with different areas of human-wildlife conflicts

In your capacity as a wildlife professional, please indicate the likely level of your personal involvement in each of the following areas of human-wildlife conflicts during the next 5 years.

| Area of conflict | Major Involvement | Moderate Involvement | Minimal Involvement |
|------------------------------------|-----------------------|-----------------------|-----------------------|
| Livestock Predation: Sheep | | | |
| Bears | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Coyotes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Swine | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Dogs | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Mountain Lions | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Wolves | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Vultures/Eagles | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Livestock Predation: Cattle | | | |
| Bears | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Coyotes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Dogs | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Mountain Lion | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Wolves | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Vultures/Eagles | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Livestock Disease | | | |
| Birds | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Rodents | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Raccoons | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Opossums | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Deer | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Swine | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Bison | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Poultry Predation | | | |
| Coyotes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Foxes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Mustelids | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Dogs/Cats | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Raccoons | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Raptors | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Poultry Disease | | | |
| Birds | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Raccoons | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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| | | | |
|--|-----------------------|-----------------------|-----------------------|
| Rodents | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Dogs/Cats | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Aquaculture & Fisheries | | | |
| Cormorants | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Hérons & Egrets | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Gulls | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Pelicans | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Raptors | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Fruit Crops | | | |
| Starlings | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Songbirds | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Rodents | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Deer | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Bears | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Grain & Cereal Crops | | | |
| Blackbirds/Starlings | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Crows/Ravens | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Misc. Songbirds | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Rodents | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Deer | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Swine | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Waterfowl | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Field & Vegetable Crops | | | |
| Blackbirds/Starlings | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Crows/Ravens | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Misc. Songbirds | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Rodents | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Coyotes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Deer | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Swine | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Bears | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Natural Resource Habitat Destruction | | | |
| Deer | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Swine | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Cormorants | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Nutria/Muskrats | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Beavers | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Natural Resources and T&E Species | | | |

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| | | | |
|---|-----------------------|-----------------------|-----------------------|
| Feral Swine | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Raccoons | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Foxes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Coyotes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Wolves | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Dogs | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Cats | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Crows/Ravens | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Property Damage (Buildings, Landscape) | | | |
| Feral Swine | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Deer | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Bears | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Raccoons | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Woodpeckers | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Vultures | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Rodents | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Human Health | | | |
| Waterfowl | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other birds | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Raccoons | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Skunks | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Bats | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral dogs | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral cats | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Aviation Safety | | | |
| Geese | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Gulls | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Raptors | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Starlings | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other Birds | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Coyotes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Deer | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Transportation Infrastructure (Roads, Bridges) | | | |
| Birds | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Beavers | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Swine | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Coyotes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Transportation: automobile safety | | | |
| Deer | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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| | | | |
|-------------------|-----------------------|-----------------------|-----------------------|
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
|-------------------|-----------------------|-----------------------|-----------------------|

Methods/tools/information needed to manage human-wildlife conflicts.

Please indicate the likely level of need in your state or region during the next 5 years for research to develop, improve, and/or evaluate each of the following methods/tools/information.

| Methods/tools/Information | High need | Moderate need | Minimal need |
|---|-----------------------|-----------------------|-----------------------|
| Predator Management | | | |
| Toxicants | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Repellents | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Traps | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Trap Monitors | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Contraceptives | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Shooting | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Aerial shooting | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Shooting with night vision technologies | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Exclusion Devices/Fencing | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Scare Devices | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Economics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Genetics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Predator ecology | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Bird Management | | | |
| Toxicants | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Repellents | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Contraceptives | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Exclusion Devices | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Dispersal devices | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Economics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Genetics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Traps/Capture devices | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Deer Management | | | |
| Toxicants | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Repellents/Lures | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Contraceptives | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Exclusion Devices | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Scare Devices | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Economics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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| | | | |
|--|-----------------------|-----------------------|-----------------------|
| Genetics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Rodent Control | | | |
| Toxicants | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Repellents | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Contraceptives | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Exclusion Devices | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Lures | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Economics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Genetics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Invasive Species Control | | | |
| Toxicants | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Repellents/Lures | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Contraceptives | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Exclusion Devices | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Scare Devices | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Economics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Genetics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Reproductive Control | | | |
| Species specificity | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Oral Delivery | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Minimize adverse effects | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Economics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Wildlife Disease Management | | | |
| Basic information on disease ecology | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Basic information on wildlife epidemiology | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| New sample collection methods | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Optimized surveillance strategies | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Wildlife adapted laboratory diagnostic tests | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Wildlife adapted field diagnostic quick tests | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Economics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Genetics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Wildlife Ecology & Population Biology | | | |
| Improved spatial sampling methods | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Improved demographic estimation methods | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Animal movement information | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Genetics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Population ecology/Social carrying capacity | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Foraging/Food habits | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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NWRC Services

While research and development of new methods is the primary mission of the NWRC, the staff and infrastructure of the Center are valuable assets to the wildlife management community. Please indicate the likely importance of each of the following activities and services to your job during the next 5 years.

Extremely Important → need arises on a recurring basis

Moderately Important → need arises one or a few times during the year

Not Important → rarely or never a need for the service or consultation

| Service | Extremely important | Moderately important | Not important |
|---|-----------------------|-----------------------|-----------------------|
| Services | | | |
| Library: general assistance | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Library: photographic images | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Library: literature searches | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Library: reprint requests | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Analytical chemistry | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Genetic analysis | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Disease diagnostics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Disease diagnostics (surge capacity) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Economic impact of wildlife damage | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Cost effectiveness of management | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Immobilization & euthanasia training | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Pesticide registration assistance | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Consultations | | | |
| Management plans | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| NEPA: basic ecological information | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| NEPA: Quality Assurance | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Disease surveillance plans | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Disease sampling strategies | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Risk assessments | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Statistical | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Effectiveness of tools/management methods | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

APPENDIX B: COPY OF THE ASSOCIATION OF FISH & WILDLIFE AGENCIES QUESTIONNAIRE

The National Wildlife Research Center (NWRC) is the research arm of the USDA Animal and Plant Health Inspection Service (APHIS), Wildlife Services program. Scientists at the NWRC conduct research to develop and evaluate tools and information to resolve conflicts between humans and wildlife. To help establish research priorities at the NWRC, every 5 years the Wildlife Services Deputy Administrator requests feedback from the program and its stakeholders. This feedback helps to determine the NWRC’s research focus, hiring priorities, and resource allocation. **Thus, your participation in this process is very important, and we value your feedback. Please take 15 minutes to complete the following assessment.**

Thank you in advance for taking the time to complete this research needs assessment.

Please identify your current employment status.

| I am employed by: | |
|---|---|
| <input type="radio"/> APHIS-Wildlife Services-Operations | <input type="radio"/> National Park Service |
| <input type="radio"/> APHIS-Wildlife Services-NWRC | <input type="radio"/> U.S. Fish and Wildlife Service |
| <input type="radio"/> APHIS-Veterinary Services | <input type="radio"/> U.S. Geological Survey |
| <input type="radio"/> APHIS-Biotechnology Regulatory Services | <input type="radio"/> Bureau of Land Management |
| <input type="radio"/> APHIS-Plant Protection & Quarantine | <input type="radio"/> National Oceanic and Atmospheric Administration |
| <input type="radio"/> APHIS-Animal Care | <input type="radio"/> Department of Defense |
| <input type="radio"/> Agricultural Research Service | <input type="radio"/> Other |
| Define Other: | |

| Which of the following best describes your principal job: | |
|---|---|
| <input type="radio"/> Executive (SES) | <input type="radio"/> WS State Director |
| <input type="radio"/> Manager | <input type="radio"/> WS Assistant State Director |
| <input type="radio"/> Research Grade Scientist | <input type="radio"/> WS District Supervisor |
| <input type="radio"/> Biologist | <input type="radio"/> Technician |
| Other (Define): | |

What is your work zip code? _____

| Which of the following best describes your age? |
|---|
| <input type="radio"/> 18-24 years |
| <input type="radio"/> 25-40 years |
| <input type="radio"/> 41-59 years |
| <input type="radio"/> 60 years or more |

Importance of different areas of human-wildlife conflict

Wildlife damage management involves various types of conflict. Please indicate the likely importance of each of the following areas of conflict **in your state or region** during the next 5 years in terms of impact on production and/or economics, human health and safety, property damage, etc.

| Nature of conflict | Highly | Important | Moderately important | Minimally important |
|---------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Predation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Cattle | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Sheep | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Swine | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Goats | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Poultry | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Furbearers (farm raised) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Crops/Agriculture | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Fruit | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Grains & cereals | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Nuts | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Seeds | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Vegetables | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Forestry | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Aquaculture | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (specify): | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Wildlife & Disease Issues | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Dairies | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feedlots | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Public health | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Wildlife health | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Poultry | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Livestock | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Natural Resources | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| T&E species | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Sport fisheries | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Big game | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Upland birds | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Waterfowl | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Miscellaneous | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Nuisance wildlife | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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| | | | | |
|-------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Property | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Golf courses | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Aviation safety | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Automobile safety | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Transportation infrastructure | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (specify): | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Involvement with different areas of human-wildlife conflicts

In **your capacity as a wildlife professional**, please indicate the likely level of your personal involvement in each of the following areas of human-wildlife conflicts during the next 5 years.

| Area of conflict | Major | Involvement | Moderate Involvement | Minimal Involvement |
|-----------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Livestock Predation: Sheep | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Bears | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Coyotes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Swine | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Dogs | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Mountain Lions | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Wolves | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Raptors | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Livestock Predation: Cattle | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Bears | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Coyotes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Dogs | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Mountain Lion | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Wolves | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Livestock Disease | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Birds | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Rodents | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Raccoons | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Opossums | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Deer | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Swine | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Poultry Predation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Coyotes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Foxes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Mustelids | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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| | | | | |
|--------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Feral Dogs/Cats | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Raccoons | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Poultry Disease | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Birds | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Raccoons | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Rodents | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Dogs/Cats | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Aquaculture & Fisheries | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Cormorants | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Hérons & Egrets | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Gulls | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Pelicans | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Fruit Crops | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Starlings | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Songbirds | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Rodents | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Deer | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Grain & Cereal Crops | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Blackbirds/Starlings | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Crows/Ravens | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Misc. Songbirds | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Rodents | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Deer | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Swine | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Field & Vegetable Crops | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Blackbirds/Starlings | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Crows/Ravens | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Misc. Songbirds | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Rodents | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Coyotes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Deer | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Swine | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Natural Resource Habitat Destruction | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Deer | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Swine | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Cormorants | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Nutria | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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| | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| Beavers | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Natural Resources and T&E Species | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Swine | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Raccoons | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Foxes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Coyotes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Wolves | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Dogs | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Cats | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Crows/Ravens | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Property Damage (Buildings, Landscape) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Swine | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Deer | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Bears | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Raccoons | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Woodpeckers | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Vultures | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Rodents | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Human Health | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Waterfowl | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other Birds | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Raccoons | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Skunks | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Bats | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Dogs | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Aviation Safety | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Geese | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Gulls | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Raptors | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Starlings | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other Birds | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Coyotes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Deer | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Transportation Infrastructure (Roads, Bridges) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Birds | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Beavers | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Feral Swine | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Coyotes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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| | | | | |
|-----------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Transportation: Automobile Safety | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Deer | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Methods/tools/information needed to manage human-wildlife conflicts.

Please indicate the likely level of need in your state or region during the next 5 years for research to develop, improve, and/or evaluate each of the following methods/tools/information.

| Methods/tools/Information | High | Need | Moderate need | Minimal need |
|---|-----------------------|-----------------------|-----------------------|-----------------------|
| Predator Management | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Toxicants | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Repellents | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Traps | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Trap Monitors | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Contraceptives | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Shooting | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Aerial shooting | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Shooting with night vision technologies | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Exclusion Devices/Fencing | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Scare Devices | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Economics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Genetics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Bird Management | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Toxicants | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Repellents | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Contraceptives | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Exclusion Devices | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Scare Devices | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Economics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Genetics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Deer Management | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Toxicants | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Repellents | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Contraceptives | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Exclusion Devices | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Scare Devices | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Economics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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| | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|
| Genetics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Rodent Control | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Toxicants | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Repellents | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Contraceptives | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Exclusion Devices | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Scare Devices | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Economics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Genetics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Invasive Species Control | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Toxicants | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Repellents | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Contraceptives | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Exclusion Devices | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Scare Devices | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Economics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Genetics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Reproductive Control | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Species specificity | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Oral Delivery | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Minimize adverse effects | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Economics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Wildlife Disease Management | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Basic information on disease ecology | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Basic information on wildlife epidemiology | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| New sample collection methods | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Optimized surveillance strategies | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Wildlife adapted laboratory diagnostic tests | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Wildlife adapted field diagnostic quick tests | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Economics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Genetics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Wildlife Ecology & Population Biology | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Improved spatial sampling methods | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Improved demographic estimation methods | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Animal movement information | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Genetics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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NWRC Services

While research and development of new methods is the primary mission of the NWRC, the staff and infrastructure of the Center are valuable assets to the wildlife management community. Please indicate the likely importance of each of the following activities and services to your job during the next 5 years.

Highly Important → need arises on a recurring basis

Moderately Important → need arises one or a few times during the year

Not Important → rarely or never a need for the service or consultation

| Service | Highly | Important | Moderately important | Not important |
|--------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Services | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Library: general assistance | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Library: photographic images | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Library: literature searches | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Library: reprint requests | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Analytical chemistry | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Genetic analysis | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Disease diagnostics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Disease diagnostics (surge capacity) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Economic impact of wildlife damage | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Cost effectiveness of management | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Immobilization & euthanasia training | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Pesticide registration assistance | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Consultations | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Management plans | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| NEPA: basic ecological information | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| NEPA: Quality Assurance | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Disease surveillance plans | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Disease sampling strategies | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Risk assessments | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Statistical | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Effectiveness of management methods | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other (Specify) : | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

What do you anticipate to be your top research need/priority, during the next 5 years to address human-wildlife conflicts in your state or region? Give a brief description of the problem, background on the magnitude and/or location of the problem, and the importance of research in this area.
