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Regulatory and Policy Issues around Nontarget Mortality and Environmental Fate of Rodenticides

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ABSTRACT: One of the goals of this Symposium was to bring together agricultural and conservation users of rodenticides to discuss the impacts of rodenticides on the environment, examine the current regulatory climate governing their use, and identify ways that users can reduce or eliminate these impacts. Some of the presentations in today's symposium highlighted specific impacts, and the preceding talk described the scenario of what can happen if an issue related to pesticide impacts ends up in the courts. The three agencies that were represented on this panel (USDA, USFWS, and EPA) have regulatory oversight and enforcement authority for the use of rodenticides and/or the adverse effects resulting from the use of rodenticides. In addition, USDA and FWS are the primary federal users of rodenticides for agriculture and conservation. USDA holds the registrations for a number of rodenticide products for agricultural and conservation purposes. Panelists were asked to describe how Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), Migratory Bird Treaty Act (MBTA), Endangered Species Act (ESA), National Environmental Policy Act (NEPA), the Animal Damage Control Act, and the administration of USDA's pesticide labels apply to rodenticide adverse effects. Panelists were then asked to bring up an issue within the scope of their agency that they view as problematic for conducting eradication projects. Panelists were also asked to suggest proactive measures that the rodent eradication community can undertake to improve future rodent eradication efforts. Finally, the floor was opened to audience members for questions and comments.

KEY WORDS: FIFRA, non-target species, pesticides, rodent eradication, rodenticides

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Our intention when planning the symposium *Field Rodenticide Uses: Current Issues of Nontarget Mortality, Environmental Fate and Policy*, as a special session of the 24th Vertebrate Pest Conference, was to bring together agricultural and conservation users of rodenticides to discuss the impacts of rodenticides on the environment, examine the current regulatory climate governing their use, and identify ways that users can reduce or eliminate these impacts. Through invited speakers, the symposium led the audience through a series of talks beginning with case studies of rodenticides used to eradicate island rodents, realized primary and secondary nontarget mortalities, current advances in assessing potential risks, and ending with changes in the regulatory environment applicable to all field uses of rodenticides.

The final session of the symposium was a panel discussion, moderated by John Eisemann and Katie Swift, focused on regulatory issues surrounding field application of rodenticides. We invited three Federal agencies to participate on the panel, U.S. Department of Agriculture (USDA), U.S. Fish and Wildlife Service (FWS), and U.S. Environmental Protection Agency (EPA). Two of these

agencies (FWS and EPA) have regulatory oversight and enforcement authority for the use of rodenticides and/or the adverse effects resulting from the use of rodenticides. Two agencies (USDA and FWS) utilize rodenticides to conduct rodent eradications on islands and are subject to these regulations. One agency (USDA) utilizes rodenticides for agricultural protection and holds the registrations for a number of rodenticide products for agricultural and conservation purposes. The panel was comprised of:

- **Meredith Laws**, Chief, Insecticide-Rodenticide Branch, Registration Division, U.S. Environmental Protection Agency, Office of Pesticide Programs, Washington, D.C.
- **William Meeks**, Chief, Branch of Wildlife Resources, U.S. Fish and Wildlife Service, National Wildlife Refuge System, Washington, D.C.
- **Gary Young**, Assistant Special Agent In Charge, U.S. Fish and Wildlife Service, Office of Law Enforcement, Anchorage, AK
- **Rory Stark**, Special Agent, U.S. Fish and Wildlife Service, Office of Law Enforcement, Anchorage, AK
- **Dr. Mark Tobin**, Assistant Director, USDA APHIS

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We asked panelists three questions related to their respective Agencies' involvement with rodenticide application. Questions to panelists centered on regulatory oversight of pesticide application, adverse effects reporting, issues they view as problematic for continued use of rodenticides, and recommendations for rectifying these issues. Finally, the floor was opened to audience members for questions and comments.

Question 1:

Give a detailed overview of the regulations your agency is responsible for administering that relate to the non-target effects and environmental fate of rodenticides in agricultural and conservation situations.

The primary law that regulates the use of pesticides is the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). The EPA administers this Act through pesticide product registration and labeling requirements. It is a cost-benefit act, and scientific analysis is based on data concerning the environment, society, and economic variables to determine the acceptable uses and conditions for use, if any, of the pesticide. The standard of analysis requires that the pesticide and its acceptable uses not cause harm to human health, with reasonable certainty, or pose unreasonable risks to the environment. Being a cost-benefit Act, EPA has flexibility when considering pesticide registrations. For example, the conservation uses of rodenticides have recognized environmental risks, but the overall benefit of a successful rodent eradication on an island may outweigh the potential environmental risk, allowing EPA to grant that type of use.

The other principal Act regulating the use of pesticides is the Federal Food, Drug and Cosmetic Act (FFDCA). This act applies to pesticides when the intended use is on human food or animal feed products, or the pesticide could be expected to contact food or feed. The FFDCA regulates the establishment of pesticide tolerances, or allowable pesticide residues on food or feed items. The establishment of a tolerance is not typically required for conservation uses, but could be necessary for some agricultural uses.

FWS has regulatory authority over migratory birds (Migratory Bird Treaty Act, MBTA) and threatened and endangered species (Endangered Species Act, ESA). These laws can have direct impact on allowable pesticide uses. The EPA Office of Pesticide Programs has staff within the Environmental Fate and Effects Division dedicated to assessing the impacts of potential pesticide uses on endangered and other nontarget species; however, it is not uncommon for EPA to consult with FWS on registration actions with higher potential for environmental risk or those that present unique risk scenarios. From a FWS Law Enforcement perspective, pesticide cases are handled just like any other infraction of the law. When FWS Law Enforcement is involved in a case involving pesticides, it typically involves a violation of the MBTA or the ESA. In these cases, FWS Law Enforcement investigates the event and then presents the investigative

findings to the United States Attorney's Office. The U.S. Attorney's Office determines whether to prosecute.

The FWS also operates in a nonregulatory role, similar to USDA Wildlife Services, as a pesticide applicator and consequently is subject to all applicable laws and regulations. Both FWS and USDA ensure that Agency personnel involved in pesticide application are trained accordingly, including certified pesticide applicator training if required, and are familiar with state and federal regulations regarding pesticide use. USDA Wildlife Services biologists routinely require modifications to approved pesticide uses and work with the USDA Wildlife Services, National Wildlife Research Center (NWRC) registration staff to ensure all uses are covered under approved pesticide labels.

Two recent events impact the use of rodenticides in both agricultural and conservation settings. First, in January 2009, the U.S. Sixth Circuit Court ruled that pesticide applications made directly to water or over or near water where a portion of the pesticide will unavoidably be deposited into water will require a permit under the Clean Water Act. Under EPA's current interpretation of the ruling, rodenticide uses may require permitting in the following situations: area-wide and ditch-bank pest control, aquatic nuisance animal control, and large-scale rodenticide application (i.e., broadcast baiting for conservation uses). More information can be found on this topic in the proceedings of this symposium in the paper "Clean Water Act Permitting of Discharges from Pesticide Applications" (TenBrook 2010).

Another significant regulatory action that will impact the use of rodenticides is a recent decision by the FWS to clarify that the take of migratory birds can be permitted by the MBTA for rodenticide use, however the project must benefit migratory birds (Kurth 2010). The mechanism is through a Special Purposes Miscellaneous permit in which 'the applicant demonstrates expected benefits to migratory birds' as a result of the project (Kurth 2010). This action is noteworthy given the recent significant nontarget mortality observed following the eradication attempt of invasive Norway rats (*Rattus norvegicus*) on Rat Island in the Alaska Maritime National Wildlife Refuge, for which no permit was issued. Similar permitting is not available to agricultural uses of rodenticides, unless the project benefits migratory birds.

Question 2:

How are unintended adverse incidents that are caused by a specific rodenticide application handled by your agency?

Panelists discussed two approaches to responding to adverse incidents occurring as a result of pesticide use, regulatory responsibility, and the development of Best Management Practices (BMPs) or Standard Operating Procedures (SOPs). First and foremost is the pesticide registrants' and agents' statutory responsibility under FIFRA Section 6(a)(2) to report adverse incidents to the EPA. In 1998, EPA outlined a specific regulatory framework for submitting adverse incident reports (US EPA 1998). This guidance clearly defines reporting timeframes for incidents depending upon the type of incident,

the organisms involved, and the severity of the incident. EPA uses this information to evaluate each event, individually, and in conjunction with other events involving similar products. EPA looks for trends in incidents and evaluates the benefit of imposing mitigation measures to lower risk. This is usually done through requiring pesticide label amendments. A good example of this process is the recent mitigation requirements placed on rodenticides for the protection of children. EPA has observed that since 1993, the American Association of Poison Control Centers annually has received reports of approximately 12,000 to 15,000 rodenticide exposures to children less than 6 years of age. EPA responded by implementing measures that would make the products less accessible to children (US EPA 2008).

Investigation of potential criminal actions is another aspect of regulatory oversight of pesticide incidents. EPA's regulatory enforcement is primarily handled by regional staff or through individual state pesticide authorities. Agents of the U.S. Fish and Wildlife, Office of Law Enforcement, have sole responsibility to investigate suspected violations of wildlife law. FWS Law Enforcement typically investigates cases involving illegal trade of wildlife; however, they can be asked to investigate pesticide related incidents if there is a suspected violation of the Endangered Species Act or Migratory Bird Treaty Act. FWS Law Enforcement's involvement in any case is to determine if criminal activity occurred. They then pass the investigative findings to the U.S. Attorney's Office, Division of Environmental and Natural Resources, as has occurred with regard to the Rat Island incident in which numerous migratory birds died as a result of a rodenticide application.

Another aspect of adverse effects incidents is how responsible agencies deal with internal investigations of incidents and what is done with that information. FWS and USDA Wildlife Services both share the view that any adverse incident is unfortunate. However, adverse incidents also provide an opportunity to learn. A thorough analysis of the conditions that resulted in the incident can be used to implement corrective measures and serve as the basis for Best Management Practices (BMPs). In the case of rodent eradication projects, post-application monitoring is critical. While these projects have enormous conservation potential, they also have enormous potential to result in environmental harm. Information obtained during post-application investigations should lead to improvements in the design of future projects, as well as identification of practices that should be avoided or mitigation measures that could be employed to avoid future incidents.

Question 3:

What do you think is the most important issue relating to the environmental impacts of rodenticides that the regulatory agencies need to resolve? Are there measures that the users can undertake that would help?

Four distinct points came from the discussion of this question. First, it is critical that multiple tools are

available to control rodents, and more effort should be placed on the development of new tools and new uses of existing tools. Second, every panelist agreed that continued effort must be put into reducing the nontarget impact of rodenticide use. Third, as government conservation agencies, we must hold ourselves to higher standards when using pesticide products. Finally, it is recognized that in some instances the broad-scale field use of rodenticides will unavoidably result in some nontarget impacts, and some regulatory latitude must be given to users in recognition of the benefits achieved with their use.

All panelists indicated the reduction of primary and secondary hazards associated with all rodenticide use must be a top priority. Rodenticides must be recognized as poisons, and users must implement all reasonable options for minimizing risks associated with their use. The registration of rodenticide products for conservation purposes is one of the most significant developments in island restoration efforts in recent history, and it has the potential to have profound positive conservation impacts on islands within the U.S. and its holdings. Every effort should be made to keep these tools. Because of the potential for significant environmental impact, poorly-planned use of these tools in eradication projects can only strain our ability to keep these products. Therefore, those responsible must consider the benefits and costs (not just monetary) for each project, as well as the overall long-term impact on the eradication program initiative when using this tool. Standardized guidelines should be developed and adopted to ensure eradication projects are properly planned and monitored. Openly planning activities, in which expert opinion is solicited and genuinely considered, is essential to developing a cohesive multi-agency and private entity effort to achieve these conservation goals and retain continued use of rodenticide products. All eradication projects must have an intensive monitoring component. Each eradication project should serve to improve subsequent projects. This cannot be done without monitoring and open communication among project planners.

There will never be a single solution to managing wildlife damage issues, nor should we feel compelled to develop one. Countless examples illustrate that reliance on any one tool can lead to disastrous effects. But more importantly, a single tool may not always be the best option for every situation. The most logical approach to successfully managing wildlife damage is to provide an array of tools to managers. In the case of rodenticides, this equates to maintaining the availability of multiple compounds, formulations, and application techniques so that control methods can be efficiently tailored for each management situation.

EPA supports the safe use of rodenticides in commensal, agricultural, and conservation uses. However, they recognize the limitations of existing technologies and how they are used. EPA suggested that more work should occur to provide details in label language, in order to reduce risk as well as make the labels more enforceable in the event of misuse. This was pointed out in the talk given by Stella McMillin early in the symposium. This was an excellent example of a joint

effort among community members, regulators, and a rodenticide manufacturer to evaluate the adverse impact of a chlorophacinone product application on Canada geese, and to develop new label language that should minimize future risk from that label's particular use pattern (McMillin and Finlayson 2010). EPA also encourages the development of new chemical tools but will continue to work towards minimizing the risk of chemical tools on the natural and human environments. The development of new rodenticides and uses has lagged behind other pesticide developments. During the last 5 years, Office of Pesticide Programs has approved 961 new agricultural chemical uses, of which only 5 approvals were related to rodenticides. The opportunity is always there to propose new chemicals and uses that pose less risk.

In general, panelists believe there are adequate regulatory mechanisms in place for field uses of rodenticides. From a law enforcement perspective, pesticide law is black and white, with the label being the document from which most infractions will be determined. It was pointed out that regulatory jurisdiction is continually evolving, and reference was again made to the symposium talk presented by Patti TenBrook. As a result of a lawsuit, EPA must now consider permitting under the Clean Water Act when pesticide applications are made over or near bodies of water. Prior to this lawsuit, the risk analysis conducted by the Office of Pesticide Programs was considered adequate analysis and oversight.

The larger issue discussed by the panel was how the FWS should handle the impacts of pesticide applications to migratory birds. The discussion focused on rodenticides and the recent nontarget mortalities that occurred during agricultural applications to control prairie dogs, and a conservation application to eradicate rats from an island. In both instances, investigative findings were presented to the U.S. Attorney's Office for prosecution. To date, only the agricultural applicators have been prosecuted for the nontarget mortalities. FWS recognizes the dual standard that has been created by pursuing legal actions against agricultural applicators for killing raptors, and not pursuing legal actions against themselves and their cooperators for killing raptors and other protected species during conservation projects. However, as stated earlier, the decision to prosecute lies with the U.S. Attorney's Office, not the FWS. In response, FWS has developed an internal memo clarifying that a Special Purposes Miscellaneous permit can be issued, if applicable, for the unintended take of migratory birds as a result of invasive species control projects that benefit migratory birds, including those that involve pesticide applications (Kurth 2010). This essentially releases conservation users from legal liability under MBTA. One panelist suggested that it is inappropriate for FWS to place higher societal benefit on conservation uses than agricultural uses. The panelist went on to emphasize that the opportunity to permit take of migratory birds should be extended to agricultural uses, or should be curtailed in conservation by requiring that conservation users adhere to the same standards established for agricultural pesticide uses.

AUDIENCE QUESTIONS

Question 1:

How can we quantify the benefits obtained by rodenticide applications made to agricultural and conservation uses?

As conservation stewards, Wildlife Services and the Fish and Wildlife Service both consider this a very important issue. The National Environmental Policy Act (NEPA) process is designed to address this question, and any project conducted with Federal involvement must undergo analysis under NEPA. However, because the community of users conducting eradication projects is small, there is a real opportunity to work collaboratively to develop standard operating procedures (SOPs) or Best Management Practices (BMPs) guidelines for assessing both benefits and risk during project planning. The benefits of conservation uses are sometimes more straight-forward to evaluate than public health, or to some extent, agricultural uses. EPA places a lot of trust in other agencies' opinions on the use of pesticide products. If a Federal agency manages a product for conservation uses and proposes using the product, EPA's preliminary opinion is that the conservation benefits of the product must outweigh the risks to nontarget species and the environment, or the agency would not have proposed the work.

Question 2:

There is some concern that projects may occur that have less planning and consideration for environmental impact. How can these projects be reviewed, with the intent of using the findings to design future projects?

Again, collaborative relations among users will result in the most effective solutions. In the case of conservation projects, this could take the form of an informal working group composed of experts from multiple state and federal agencies, as well as from private industry and stakeholder groups. An excellent example of that strategy was presented by Stella McMillin in her talk "Investigation of chlorophacinone-related goose deaths in Monterey County, California" (McMillin and Finlayson 2010).

Question 3:

What is the process for ensuring assertions or proposals made in planning documents (NEPA, operational plans, monitoring plans, mitigation plans, etc.) are evaluated for accuracy and integrity after a project has been conducted? Where is the accountability linking what is asserted or assessed before and what actually occurs afterwards, especially with regard to large-scale eradication or control projects using toxicants for conservation purposes?

There was no response from members of the panel.

Question 4:

How should biosecurity measures be incorporated into eradication planning to avoid accidental rodent reintroductions?

No eradication project is worth doing if post-application biosecurity is not well-planned and there is a not a demonstrated commitment to adhering to the

biosecurity plan. Some recent eradication projects can be used to illustrate inadequate biosecurity measures. Concrete measures can be taken on the macro scale to demonstrate a commitment to biosecurity measures. For example, to protect the islands in Alaska, the State passed a law that prohibits harboring rats on ships. The law is taken seriously enough that ship boardings are occurring for rodent inspections.

Question 5:

What kind of discussion is going on within your agencies concerning the recent events on Rat Island?

EPA expressed concern over the high number of bird mortalities that occurred on Rat Island. However, they defer judgment on the nontarget mortalities versus the benefits to FWS-protected species to the FWS as the principal government conservation agency promoting the project. The FWS Law Enforcement Office has completed their investigation and turned their findings over to the Department of Justice. They are not sure what the DOJ will do with the case. However, Law Enforcement believes that the FWS needs to use the case to develop requirements during planning and project implementation to better anticipate and handle future events. To this end, FWS Refuges has initiated independent, outside review of the Rat Island eradication project. Despite the nontarget impacts, FWS holds the opinion that eradicating the invasive rats from the island will be beneficial to the ecosystem.

SUMMARY

The panelists provided a summary of the laws, policies, regulations, and practices that their respective agencies apply to the nontarget effects and environmental fate of rodenticides from field uses. There is not a standardized approach to dealing with adverse incidents resulting from individual applications. Three examples were examined (a prairie dog control incident, the Rat Island rat eradication project, and a Canada Goose incident in California). The consequences depend on the identity of the user, the purpose of the use, how well all of the parties worked together to resolve the issue, and whether the issue can be remedied by simple changes to the label, among other factors.

Wildlife Services and the U.S. Fish and Wildlife Service emerged as the two agencies in the position to provide leadership in developing SOPs that could be uniformly applied to agricultural and conservation users to reduce the potential for adverse affects. These SOPs would include extensive environmental monitoring, particularly for conservation applications where the amount and rate of rodenticides applied is higher, the risk of exposure to nontarget species is greater, and the pathways of rodenticide migration within ecosystems are less well-known. Post-application monitoring can catch problems early so that they can be responded to quickly, before they compound. This holds true for both conservation and agricultural uses and would have reduced the number of nontarget mortalities in all three adverse incidents discussed. Several conservation applications which incorporated extensive monitoring can be used as models.

In closing, the panel moderator urged attendees to work together on common issues that will benefit both agricultural and conservation users. Among these are the development of SOPs, uniform enforcement of laws and regulations, and collaborating to identify and fund research and modeling that can better predict and mitigate for impacts from all field uses of rodenticides.

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