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Using a Survey to Gauge Public Opinion on the Status of the Prudence Island, RI Deer Herd

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Introduction

White-tailed deer (*Odocoileus virginianus*) have been overabundant on Prudence Island, RI for at least 25 years (Raposa and Greene 2003). This has directly led to widespread degradation of island flora and habitats, high incidences of tick-borne diseases, and sometimes to poor health of the deer herd itself. The Rhode Island Division of Fish and Wildlife (RIDFW) is charged with managing the size of the deer herd and, in response to the high numbers, attempted to reduce the size of the herd to more normal levels in the mid-1990s. However, a small but vocal group of citizens successfully lobbied to stop this attempt to reduce the deer abundance. The Prudence Island deer herd has since rebounded to levels far above what are considered healthy and normal. More recently, the Narragansett Bay National Estuarine Research Reserve (NBNERR), stationed on Prudence Island, has recognized the problems associated with the large deer herd and is now working in conjunction with RIFWS on this issue. The first step taken by the NBNERR was to develop and distribute a comprehensive survey to gauge public opinion on the status of the Prudence Island deer herd. The goal was to determine the opinions of all people who live on or use the island in some capacity. Using this approach, the true feelings of all people associated with Prudence Island would be known rather than only the views of a small percentage of people associated with the island. The goal of this paper is to describe the survey methodology and to summarize the major findings from the survey.

Survey Methods

The survey was developed by the Manager and the Education Coordinator of the NBNERR, and was based loosely on other surveys that were previously developed to gauge public perception of white-tailed deer (Purdy and Decker 1989, Siemer et al. 1992, Loker 1996). The survey was made up of six sections, including 1) personal information, 2) relationship with Prudence Island and initial thoughts about deer hunting on the island, 3) upland activities on the island, both relating to and not relating to deer, 4) public health issues related to tick-borne diseases and deer, 5) personal feelings about deer on the island, and 6) questions for hunters only. The survey contained 25 sub-sections of questions, and 58 total questions. Space was also provided in some cases for users to enter personal comments.

The survey was available to the public in both hard copy and electronic format. Hard copies were made available at the NBNERR field station and at the local store at the Prudence Island ferry landing. The electronic version was made available on the Internet. People could also request that copies be mailed or faxed to them. Informational materials on the Prudence Island deer herd and deer management in general were provided along with the survey in hard copy and digital formats as described above.

Efforts were made to make as many people as possible aware of the issues surrounding the Prudence Island deer herd and of the survey effort. A public meeting was held at the NBNERR on October 11, 2003 to discuss these topics. Signs about the survey were

posted on the Prudence Island Ferry and at the general store at the ferry landing on Prudence Island. An article about the deer herd and the survey was published in the Bristol (RI) Phoenix newspaper. Postcard mailings were distributed to permanent and part-time residents of Prudence Island using addresses obtained from the Tax Collector's records from the town of Portsmouth, RI (approximately 350-375 mailings). In addition, NBNERR staff sent emails and made phone calls to any additional people that were deemed appropriate for filling out this survey.

The survey was available from October 11, 2003 to January 31, 2004, after the end of the deer-hunting season. All completed surveys were entered into Survey Monkey, an online survey tool (surveys completed on-line were automatically entered into Survey Monkey). After all surveys were entered, Survey Monkey was also used to compile basic summary results based on six different user groups: All respondents combined, hunters only, year-round residents (including resident hunters), summer residents, occasional summer visitors, and others.

Survey Results and Discussion

The survey was filled out and returned by a total of 182 people. Of this total, 49 were hunters, 53 were year-round residents or resident hunters, 62 were summer residents, 33 were occasional summer visitors and 54 were categorized as other. Some respondents were classified in more than one user group (e.g., some people might have been summer residents for a period of time, and then became year-round residents), resulting in a tally of user groups that is larger than the 182 total responses.

Personal Information

Overall, the majority of respondents (59%) were more than 51 years old. The same pattern was true for year-round residents (including resident hunters), summer residents, and others. Hunters and occasional summer visitors were generally younger, with the majority in both cases being between 31 and 50 years old. In all cases, most of the respondents were male (64% male overall), including 100% of hunters.

Relationship with Prudence Island/Initial thoughts about Hunting

Among year round residents that own adequate property, 65% allow hunting on their land. Among summer residents who also own adequate property, this number is reduced to 54%, illustrating that summer residents are less likely to allow hunting on their property than permanent residents. However, this may be due to the fact that summer residents are simply not present on the island during the hunting season (fall-winter). Among those with adequate land that do not allow hunting, the vast majority stated that they would not allow hunting on their property in the future (100% of year-round residents and 91% of summer residents will not allow hunting). This illustrates that it is

unlikely that more private land will be made available for deer hunting in the future. Overall, 93% of the respondents do not benefit economically from deer hunting. The same pattern was observed for all user groups, including both year-round (88%) and summer (97%) residents, indicating that there is little economic gain to most Prudence Islanders from deer hunting.

Upland Activities on Prudence Island

The first part of this section dealt with gardens and ornamental plantings on Prudence Island. Overall, most people (58%) do not have a vegetable of fruit garden on the island, but most (62%) do have ornamental plantings. Conversely, most year-round residents do have gardens (81%) and ornamental plantings (87%). Fewer summer residents had gardens (only 53%) or ornamental plantings (77%). Because relatively more people in the other user groups probably do not own property on the island, the majority of each group did not have a garden or ornamental plantings (except for others, 56% of which had ornamental plantings). Among residents, 95% and 85% take measures to protect their gardens and ornamental plantings, respectively, from deer. Similar results were observed for summer residents (91% and 78%), respectively. Coupled with the fact that the vast majority of people do not gain economically from deer or a deer hunt, these findings suggest that the converse may be true, that most people actually have to expend some unknown amount of money and time in response to deer on Prudence Island.

Overall, the majority of respondents were greatly interested in non-deer related activities such as communing with nature (58%), hiking (47%), berry picking (31%), nature photography (30%), and biking (27%). Similar trends were seen for year-round residents, summer residents, occasional summer visitors, and others, although in a few instances the level of interest for some activities was only slight or mild, rather than great. Hunters had a much different interest in using the upland resources of Prudence Island. Most hunters were not interested in biking (38%; in this case and others where the percentage is below 50%, most refers to the most common response), berry picking (44%), or pet walking (48%), and most were only mildly interested in hiking (35%) and slightly interested in nature photography (31%). Interestingly, most hunters (54%) were greatly interested in communing with nature.

In terms of deer-related activities, overall most people were greatly interested in watching (49%), photographing (26%), or seeing deer while walking or driving (46%), while most were not interested in hunting (63%) or feeding deer (75%). The same pattern was observed for year-round residents, summer residents, occasional summer visitors, and others (except that most of each user group was less than greatly interested in photographing deer). Conversely, hunters were greatly interested in all activities relating to deer, except feeding them. Results from these two sections show that most people, aside from hunters, have a great interest in using Prudence Island for outdoor activities that are not related to deer such as hiking, biking, and berry picking. However, most are also greatly interested in passive activities related to deer including deer watching and observing deer on walks or drives. Hunters, on the other hand, take less interest in non-

deer related activities, and relatively more interest in most deer related activities. Hunter's penchant for photographing deer (probably in preparation for a hunt) is the lone reason why, overall, most people were greatly interested in photographing deer. Excluding hunters, people were less interested in this activity.

Overall, most people (50%) spend several hours each day outside near vegetation, and the same was true for all user groups except for summer residents, most of who spend over five hours each day outside, and hunters, where an even amount spend several and more than five hours outside each day. The majority of all user groups (75% overall) recognize and have observed ecological damage done by deer on Prudence Island, and the majority of all user groups except hunters stated that their outdoor activities are hindered by the presence of tick-borne diseases. Overall (including hunters), 68% of the respondents have their activities impacted by tick-borne diseases, but 65% of hunters state the opposite. These results show that although most people associated with Prudence enjoy a diverse array of outdoor activities and spend at least several hours out of doors each day doing so, most also acknowledge that these activities are affected by the presence of tick-borne diseases, which have been shown to correlate with high deer numbers (Wilson et al. 1985). Most also realize that the high numbers of deer are also causing ecological damage to the habitats of Prudence Island, which potentially could affect the way Prudence Island is used by these different user groups in the future.

Deer Population Issues

Most respondents (68% overall) see deer daily, which is not surprising considering the high deer density throughout the year on Prudence Island. Overall, most respondents were greatly concerned about all aspects of deer over-population on Prudence Island, including (in ranked order from highest proportion that is greatly concerned to lowest percentage) health impacts within the community (65% greatly concerned), limits of activities due to tick-borne diseases (62%), health of the deer, (55%), ecological damage (49%), and damage to gardens (37%) and ornamental plantings (34%). The same was true for all user groups except that hunters and occasional summer visitors were relatively less concerned about damage to gardens (17% and 29% greatly concerned, respectively) and ornamental planting (15% and 34%, respectively). This is not surprising since most people in these groups do not have gardens or ornamental plantings. The results of this section are some of the most interesting from the survey. The majority of all groups are greatly concerned about all aspects of the deer-overpopulation on Prudence Island, with the highest concern focused on how this over-population impacts the health of the human community and how it limits their outdoor activities. Coupled with all of the previous information it is clear that the majority of people associated with Prudence Island are well aware of the overabundant deer herd on Prudence Island and are greatly concerned about the various impacts associated with this herd.

Public health Issues

Overall, most respondents have not had a tick-borne disease (67%), nor have they tested positive for exposure to one (66%). However, most (52%) have a family member who has had either Lyme disease, babesiosis, or ehrlichiosis, or has had a family member test positive for exposure to one of these (52%). An even higher majority has had friends either have one of the diseases (83%) or test positive for exposure to one (84%). In all cases, Lyme disease was by far the most common tick-borne disease afflicting people on Prudence Island. However, these results hide the fact that of all respondents, 30% stated in this survey that they have had Lyme disease, 6% have had babesiosis, and 4% have had ehrlichiosis. Similar results were observed among all user groups except hunters, most of who have not had a tick-borne disease (they are not as likely to get one while hunting in winter), nor did they have a family member who has had one; most however have a friend who had had one. This survey also shows that residents, both year-round and summer, are the groups most likely to contract a tick-borne disease. Interestingly, summer residents are more likely than year-round residents to contract Lyme disease (39% v 35%). This is most likely due to the fact that Lyme disease is most often contracted in the summer, when summer residents are on Prudence Island, and to the fact that summer residents spend more time per day outside near vegetation (five hours per day v several hours per day for year-round residents).

Most people in all user groups have not been vaccinated for Lyme disease (75% overall). Among the groups, both year-round and summer residents have been vaccinated the most (34% for each), probably reflecting the results started above that show that most residents are primarily concerned with the health impacts associated with the high deer herd.

The vast majority of all user groups associated with Prudence Island have been bitten by a dog, deer, or lone star tick (87% overall). In addition, most people in all user groups except occasional summer visitors had been bitten by a tick within the last year. Only 48% of occasional summer visitors were bit within one year compared with 68% overall. All user groups except hunters are bitten by one of these ticks several times a year (33% overall are bitten this often). Among hunters, most (30%) are bitten once per year. These data show that the vast majority of people using Prudence Island are bitten by some kind of tick at least several times per year, thus potentially exposing themselves to tick-borne diseases as was shown earlier.

Personal Feelings about Deer Management on Prudence Island

The vast majority of respondents think there is an overpopulation of deer on Prudence Island (81% overall). This percentage is highest among others (92%), summer residents (85%), and year-round residents (83%), and lowest among hunters (57%). The vast majority of respondents also support reducing the size of the deer herd (87% overall), and this finding held across all user groups, although hunters again had the lowest percentage in favor (83%).

User groups varied in their feelings towards different management strategies for deer on Prudence Island. Overall, most people were against using sharpshooters (53%) or

allowing a controlled shotgun season on North and South Prudence (45%). However, most people found it very acceptable for hunters to take more does (without jeopardizing taking a buck) (79%), increasing the quota (67%), lengthening the season for bow hunters (42%), and requesting that more private land be open for hunting (41%). Interestingly, year-round and summer residents differed greatly on this issue. Most year-round residents were only very accepting of increasing the quota (70%) and of allowing more does to be taken without jeopardizing the taking of a buck (78%). Most summer residents, on the other hand, were very accepting of all of the six management options presented in the survey. Hunters, occasional summer visitors, and others were all similar to the overall results, except that most (35%) of others were greatly accepting of a controlled shotgun hunt on North and South Prudence. Among individual management options, sharpshooters was the least favorable option overall (24% listed this as very acceptable), while allowing more does to be taken (79%), and extending the quota (69%) were by far the most popular options for reducing the herd.

In terms of the time required to reduce the deer herd, most people overall found it very acceptable for the herd to be reduced over a three-year period, as opposed to 5 or 7 years. This held true for all user groups except hunters, most of who were moderately in favor of reducing the herd over a 5-year period. Most hunters did not think that reducing the herd over a 3-year period (38%) or a 7-year period (42%) was acceptable.

Overall, most people did not think that decreasing the deer herd would lessen their Prudence Island experience if they knew that the reduction would alleviate some of the environmental impacts of deer, although the level of support for this depended on the level of reduction. For example, 82% of all respondents were in favor of a 50% reduction under the conditions described above, while this dropped to 67% for a 75% reduction, and 56% for a 90% reduction. However, this clearly shows that the majority of the overall public does not think that a reduction in the size of the deer herd, even a substantial reduction of 75-90%, would jeopardize their quality of life on Prudence Island, and therefore they would presumably not be opposed to such a reduction. These results held across most user groups, with even higher percentages reported in some cases for some user groups. Hunters were the only group whose results differed from the overall results, and their responses actually acted to reduce the percentages stated above for the overall results. The majority of hunters (62%) stated that a 50% reduction would not lessen their Prudence Island experience if they knew the reduction would be a benefit ecologically. However, most hunters did think that larger reduction would reduce their Prudence Island experience (66% and 75% thought so for a 75% and 90% reduction, respectively).

Enforcement

Overall, when asked if they thought that RIDEM enforcement of the Prudence Island deer hunt was adequate, most responded that they didn't know (51% for the paraplegic season; 35% for the bow hunt). Among those with an opinion, the most common response was that enforcement was not adequate for either hunt. In addition, when presented with an

opportunity to comment on the level of enforcement, 69 out of 172 respondents chose to do so, and the vast majority of the comments were negative or sarcastic, and many questioned if there was even any enforcement on Prudence Island at all.

Questions for Hunters Only

The average hunter began hunting deer on Prudence Island in 1986, although this ranged from 1955 to 2003. Of the hunters that responded, 33% have been hunting on Prudence Island for over 20 years, while 35% started hunting in the last ten years, and 21% in the last five years. This shows that the hunting community on Prudence Island is a mix of long-term hunters along with hunters relatively new to the island. This survey also found that nearly all of these same hunters have been coming to Prudence Island for nearly every season since they began hunting there. Interestingly, only 21% of the responding hunters began hunting on Prudence Island between 1989-1996, during the time when the deer herd on Prudence Island was at its maximum (excluding the most recent few years). All other respondents began hunting on, and continued hunting on Prudence Island during periods when the deer herd was at least 50% smaller than peak levels, illustrating that some hunters will indeed keep coming to Prudence Island to hunt even when deer numbers are reduced.

On average, hunters spend 21 days per season hunting on Prudence Island, although this ranged from 3 to 60 days. Most hunters (54%) hunt on both public and private land, while 29% and 17% hunt only on public and private land, respectively. While hunting, hunters see an average of seven deer per day of hunting, and most hunters (45%) claim that they have seen the highest numbers of deer during the most recent years between 2001-2003. Most hunters (50%) state that Prudence Island is one of their preferred places to hunt, but that they also hunt elsewhere. Coupled with the fact that another 42% stated that Prudence Island is their primary hunting area, this shows that 92% of hunters consider Prudence Island either the primary, or one of their primary, places to hunt deer. However, this study did not address the reasons why the hunters felt this way about Prudence Island (e.g., high numbers of deer, low levels of enforcement, unique qualities of Prudence Island itself, etc.).

The majority of hunters stated that they would continue to hunt on Prudence Island, either as often as they do now or at a reduced level, if the herd is reduced. If the herd were to be reduced by 50%, 81% and 15% of hunters state that they will continue to hunt, or continue to hunt, but less often, on Prudence Island, respectively. Only 4% stated that they would not hunt if the herd were reduced by this amount. If the herd were to be reduced by 75%, most hunters will either continue to hunt on Prudence Island (47%), or hunt on the island less often (19%). With a reduction of this magnitude, 34% of hunters state that they would no longer continue to hunt on Prudence Island. If the herd were to be reduced by 90%, most hunters will either continue to hunt on Prudence Island (40%), or hunt on the island less often (13%). With a 90% reduction in deer abundance, 48% of hunters state that they would no longer continue to hunt on Prudence Island.

Conclusions

This survey was successful in obtaining and summarizing the views and opinions of all people associated with Prudence Island in regards to the present and future status of the white-tailed deer herd on Prudence Island. The general findings of this survey directly contradict the opinions stated by a small but vocal minority who were opposed to a deer-herd reduction on Prudence Island in the past. This illustrates that future management decisions regarding the deer herd should not be based on such minority groups, but rather they should take into account the opinions of the populace as a whole.

This survey was filled out by 182 concerned citizens, the vast majority of who are well aware of the deer over-population problem on Prudence Island and are highly in favor of reducing the deer herd. These people are aware of the health risks, primarily the elevated risk of contracting tick-borne diseases, associated with overabundant deer. Not surprisingly, a substantial percentage of residents (year-round and summer) have contracted one of the three tick-borne diseases present on Prudence Island. Among the effects of overabundant deer, most respondents were concerned primarily with the health impacts to the community and to the way their outdoor activities are affected by the consistent threat of contracting a tick-borne disease. It is very clear that most of the respondents know there are too many deer on Prudence Island, that the high number of deer results in elevated public health risks, and that they want the herd reduced accordingly.

Respondents were also well aware of the ecological damage done by the high deer density on Prudence Island, and among their concerns, ecological damage ranked fourth after health impacts to the community, impacts to outdoor activities, and health of the deer themselves. These same respondents were very much in favor of substantial reductions in the deer herd, including reductions of 75-90%, if they knew that such a reduction would alleviate some of the ecological damage. This is an important finding considering again that ecological damage caused by deer ranked fourth out of six of the concerns of citizens. Although the question was not posed, it seems logical that an even greater percentage of people would be in favor of substantial deer reductions if they knew that it would reduce the health risk or lessen their fears of partaking in outdoor activities when ticks are active since they are more concerned with these issues rather than ecological damage caused by deer.

There was some discrepancy among user groups as to the methods used to reduce the deer herd. Overall, respondents were opposed to methods such as sharpshooters and shotgun seasons, but were in favor of increasing the number of does taken (without jeopardizing their taking of a buck) and of increasing the quota. These findings were true also of year-round island residents, but not summer residents. Summer residents were in favor of any method to reduce the deer herd, including using sharpshooters and shotguns. However, it seems obvious that this is due to the fact that by definition, summer residents are not on the island during the fall and winter hunting season, when these management options would be used. Based on this, it seems equally obvious that the methods used to

reduce the deer herd be more consistent with the overall consensus, and that of year-round residents who are present during the hunt; that is the herd should either be reduced by allowing hunters to take more does or by raising the quota, or both.

In general, hunters voiced opinions mostly similar to the general populace, although they differed on several occasions. An important finding among hunters is that most will continue to hunt on Prudence Island (although some will do so less often) if the herd were to be reduced by 50, 75 or even 90%. While this would lead to a reduction in income to the state from fewer licenses and tags being sold, this should not be a consideration when determining the management strategies of the Prudence Island deer herd. A responsible, comprehensive strategy would consider all of the concerns expressed herein by Prudence Island citizens, including human health risks and ecological damage caused by the deer. Moreover, this also shows that the hunting effort will continue on Prudence Island even if the herd were substantially reduced. Even if hunting effort were reduced accordingly, it would take equally fewer deer kills to maintain the herd once the herd is reduced. In addition, when the deer herd is lower, there is also the possibility that RIFWS can use various means to attract more hunters and thus increase the hunting effort. The reasons why hunters would or would not continue to hunt on Prudence Island after deer reductions are unclear, but the ones that stay will probably do so because they either live year-round on the island anyway (this was 27% of all hunters), or because they understand that a deer herd reduction will result in healthier and bigger deer, and in that respect, to better hunting.

In summary, the results of this survey show that the public associated with Prudence Island knows that there are too many deer on Prudence Island, and they know the problems associated with the high deer population. They clearly want the population reduced, are not averse to reducing it significantly, and they know the methods they want used to accomplish the reduction. This is important since other studies suggest that significant deer reductions are required to reduce the risk from tick-borne diseases (Deblinger et al. 1993, Wilson and Childs 1997, Telford, personal communication). Moreover, if such a reduction were to occur, hunters would continue to come to Prudence Island. All of these results indicate that the RIFWS should begin the process of substantially reducing the Prudence Island deer herd to levels that would address and alleviate the human health risks and ecological damage caused by overabundant deer, and to improve the health of the deer itself. The density of deer that is required to achieve these results varies (Raposa and Greene 2003), indicating that efforts to monitor the changes in human health risk and in island habitats should be undertaken to coincide with the deer reduction (the human risk aspect is already being addressed through the efforts of Dr. P. J. Krause of the Connecticut Children's Medical Center, University of Connecticut School of Medicine and Dr. S. R. Telford of the Department of Immunology and Infectious Diseases, Harvard School of Public Health). It has also been shown that even after the deer have been reduced it can take a long time (e.g., 10 years or more) for ecological improvements to take place, indicating that this effort should not be short-lived. Rather, the deer should be reduced presently, and should remain at low levels, perhaps unless monitoring data indicate that such a reduction has not resulted in an improvement in human health risk or ecological function on Prudence Island.

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