

Recent Important ANP Deer Related Studies

Saeki, 1991

Influence of browsing by white-tailed deer and snowshoe hare on vegetation at Acadia National Park, Maine

“Conducted a browse survey and studied browsing relationships, post-fire succession, and habitat selection of deer and hare. Notes herbivore abundance on Mount Desert Island and Isle au Haut. Also studied dietary quality using fecal crude protein.

Inventoried vegetation within exclosures on Mount Desert Island and Isle au Haut. Notes that neither area is experiencing extensive browsing by hare or deer, and that deer browsing has decreased on Mount Desert Island and Isle au Haut since the last survey conducted in 1980-81 (Gilbert and Harrison, 1982a, 1982b)” Retrieved: irma.nps.gov

Long, Harrison, and O’Connell, 1997

Annual survival and cause-specific mortality of white-tailed deer fawns on Mount Desert Island, Maine

“Studies elsewhere have suggested that low recruitment, associated with high mortality rates of fawns, may contribute to declines in deer populations. Thus, we monitored cause-specific mortality of fawns (n=29) from birth to 1 year of age during 1991-1995. Annual rate of fawn survival was 0.26. Rate of predator-caused mortality was 0.52, with coyote (*Canis latrans*) predation (n=8) accounting for at least 47% of mortalities from all causes (n=17). Mortality rate from drowning was 0.24 (n=3), and mortality rate associated with deaths from vehicles was 0.14 (n=3). An index to home-range area (MINDIST) was not different between a sample of fawns that died prior to 60 days of age (n=6) and fawns that survived (n=12). Of fawns radio-collared as neonates, 10 of 14 mortalities occurred during the first 2 months of life. Survival rate from 6 months to 1 year was 0.65; 4 mortalities (2 predation, 2 drowning) were observed during this interval. A subgroup of fawns (n=11) captured near the Sand Beach area had a higher rate of survival to 1 year of age (S=0.67) than did fawns from all other areas (n=18, S=0.00). Recruitment to 1 year of age was lower than has been observed in other northeastern deer populations. Low recruitment associated with multiple causes of fawn mortality may be limiting deer populations in some areas on MDI; however, different rates of fawn survival throughout MDI may explain an apparent patchy distribution of deer.” Retrieved: irma.nps.gov

Fuller and Harrison, 2009

Home Range, Habitat Use, Edge Relationships, Mortality Sources, Age Structure, and Survival of White-Tailed Deer on Mount Desert Island, Maine 1992-1994

"Deer populations were studied in Acadia National Park during 1992-1994 to evaluate causes of mortality, fecundity rates, yearling and adult survival rates, fawn survival rates, movements, habitat selection, and spatial interactions with roads, developed areas, and coyote territories. Twenty-seven fawns and sixteen adult deer were equipped with radio collared and monitored during the course of this study... These results suggest a high potential for interaction of deer with vehicles, humans, and coyotes within the eastern portion of ANP. We make several recommendations for future monitoring of deer population within ANP and for the increased management of deer-vehicle interactions in MDI." "Our research suggests, that with our observed estimates of fawn and adult doe survival, the deer population on MDI would be predicted to exhibit a decreasing population trajectory... not attributable to a lack of high quality forage, as documented by Saeki (1991). Our results suggest that the deer population was likely declining because of low fawn survival and low survival of yearling and adult does." Retrieved: irma.nps.gov

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Findings for Sampled Populations of Deer

- The females are older than the males (average)
- Average age of captured females – 7 years; oldest was 14
- Average age of captured males – 5 years; oldest was 14.5
- More male than female fawns, but equal number of males & females by one year
- Population models using these numbers suggested adult female suggested survival needed to be greater than 80% to maintain stable population
- Only 59% survival was documented in adult female deer, suggesting reproduction would have to increase by 43% to offset the low survival rates of adult females
- Deer reproduction on MDI matches deer reproduction for area management unit (downeast), see table below

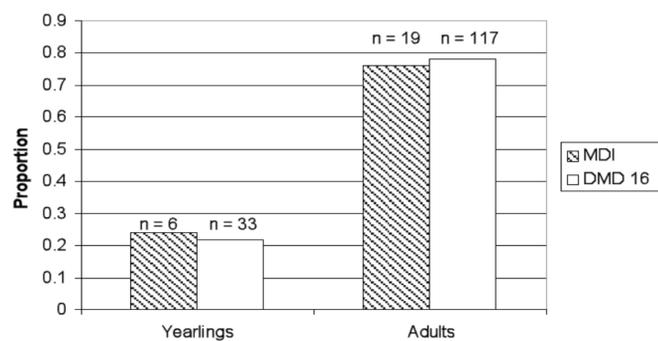


Figure 18. Proportion of yearling and adult does on Mount Desert Island (MDI) (1991 – 1994) and Deer Management District 16 (DMD 16) (1986 – 1993), Maine.

Findings about Mortality:

- Mortality sources are vehicles, predation (including dogs), and drowning
- Mortality varies by year and is very difficult to track
- The highest periods of vehicle related mortality are in spring, summer, and fall, and can exceed > 120 cases per year for the island
- Poaching occurs but actual numbers unknown
- Depredation Permits are issued by Maine Warden Service, see other poster for details

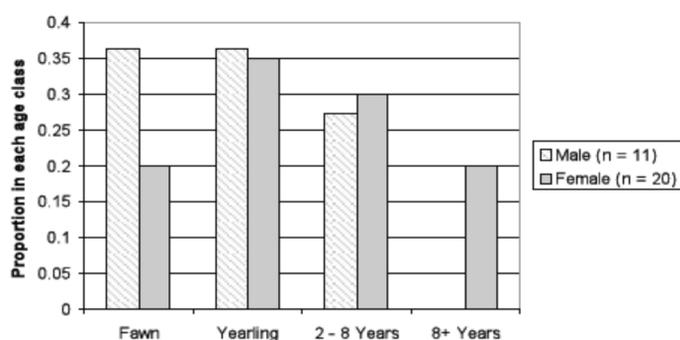


Figure 17. Age structure of road-killed deer on Mount Desert Island, Maine, 1991 – 1994.

Findings of Deer Home Ranges:

- (More than 1200 locations were used to delineate the home ranges of these deer)
- (Deer in about 10% of the ANP were studied, in the town of Bar Harbor)
- Females spent 80% of their time in the park (caught in the park; n=6)
- Males spent > 70% of their time in the park (caught in the park, n=4)
- Both females and males had bigger winter ranges than summer ranges
- Approximately 90% of home range of deer (both sexes) fell within coyote home range (See Figure below)

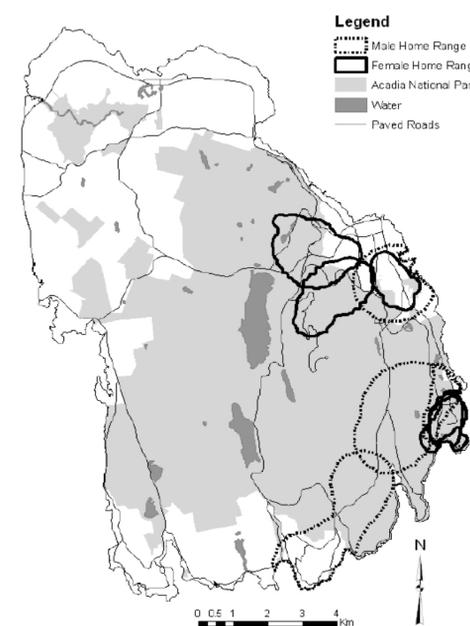


Figure 6. Yearly home ranges (95% adaptive kernel) of male (n = 3) and female (n = 6) white-tailed deer, on the eastern portion of Mount Desert Island, Maine, 1992 – 1994.

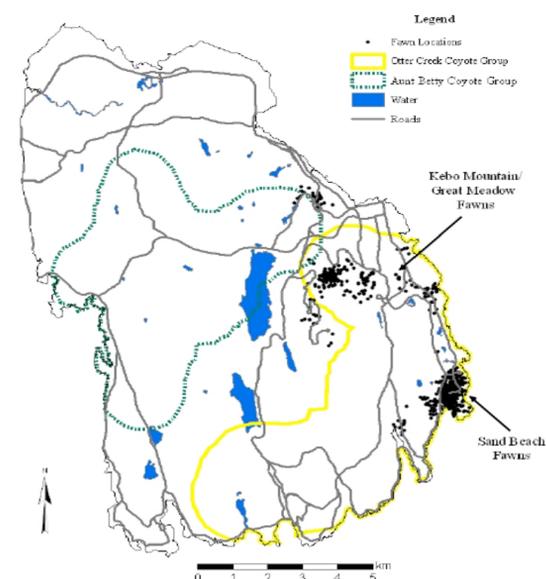
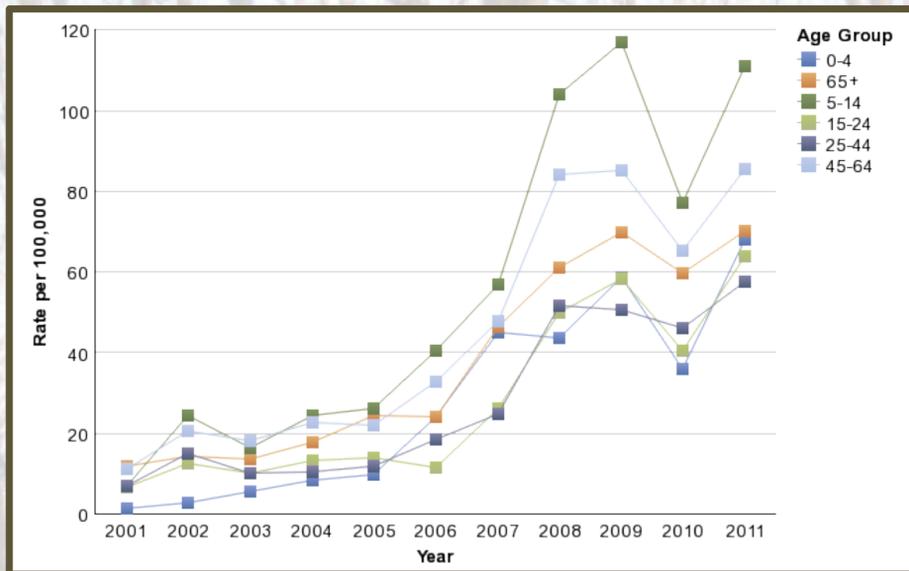


Figure 12. Radiolocations of white-tailed deer fawns (1992 – 1994) in relation to coyote home ranges (95% adaptive kernel), eastern portion of Mount Desert Island, Maine.

Lyme Disease

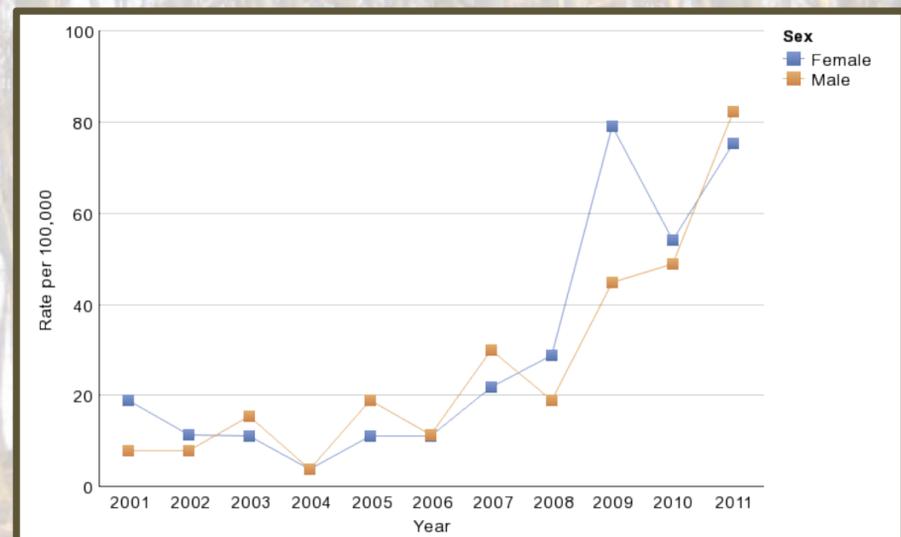
Lyme Disease By Age Group Rate per 100,000 people Maine, 2001-2011



The incident rate of Hancock County, Maine male and female residents reported to have Lyme disease for the period 2001-2011 per 100,000 people. The information is managed by the Infectious Disease Epidemiology Program of the Maine Center of Disease Control and is based upon reports from laboratories, healthcare providers and other health care partners. Revised: November 2012

Lyme Disease For Males and Females Hancock County, Maine, 2001-2011

The number of reported cases of Lyme disease per 100,000 Maine residents for the period 2001-2011. The information is collected and prepared by the Infectious Disease Epidemiology Program of the Maine Center of Disease Control from reports provided by health care providers, laboratories, and other health care partners. Revised: November 2012



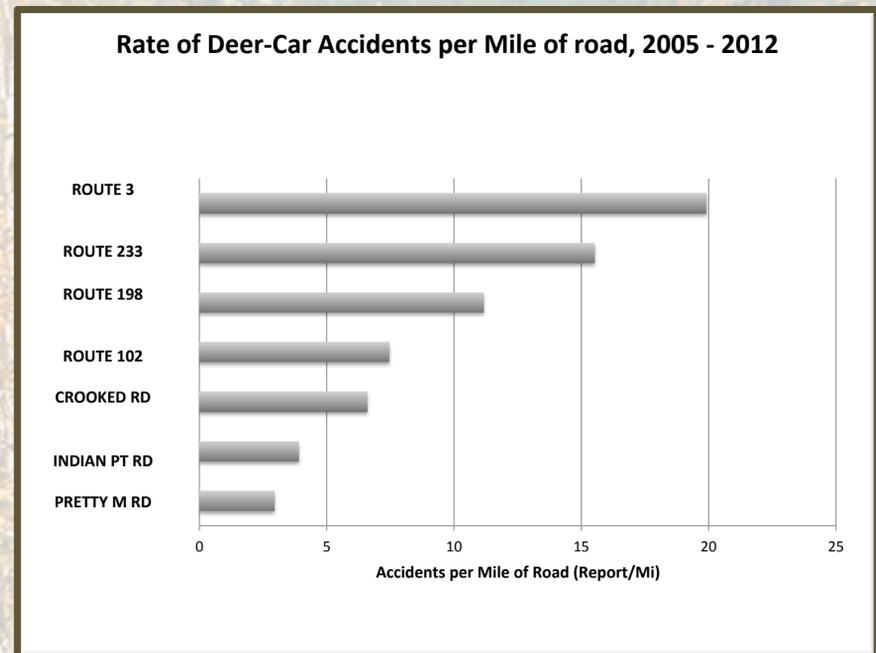
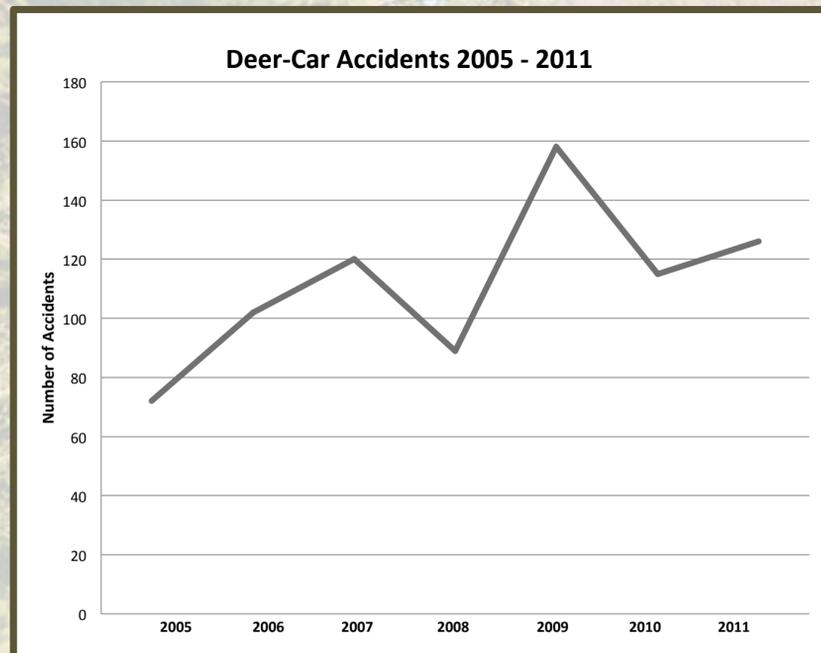
Lyme Disease and Pets

For the last several years, Acadia Veterinary Clinic has tested approximately 500 dogs a year for Lyme Disease. The percent of dogs testing positive for Lyme disease averages about 10%, although Dr. Fine suspects the level ranged between 8 and 12% over these years. Approximately five years ago, a vaccine for Lyme disease became available for dogs and an increasing number of owners have had their dogs vaccinated. Dr. Marc Fine of the Acadia Veterinary Clinic noted the following observations:

- an increased number of dog owners are finding more ticks on their dogs than in previous years
- the number of vaccinations has increased while the incidence rate of Lyme Disease has remained about 10%
- While the percentage of Lyme disease cases in dogs appears unchanged, the percentage of anaplasmosis cases has increased to between 2-3% in dogs. Anaplasmosis is carried and transmitted by deer and dog ticks.
- Cats rarely contract Lyme disease, and regular testing is unnecessary and not normally advised.

Deer-Car Accidents

Between 1987 and 1992, an average of 50 deer-car accidents were reported on MDI annually (Vinck 1993). Between 2005 and 2011, an average of 112 deer were hit on the island annually (unpublished data).



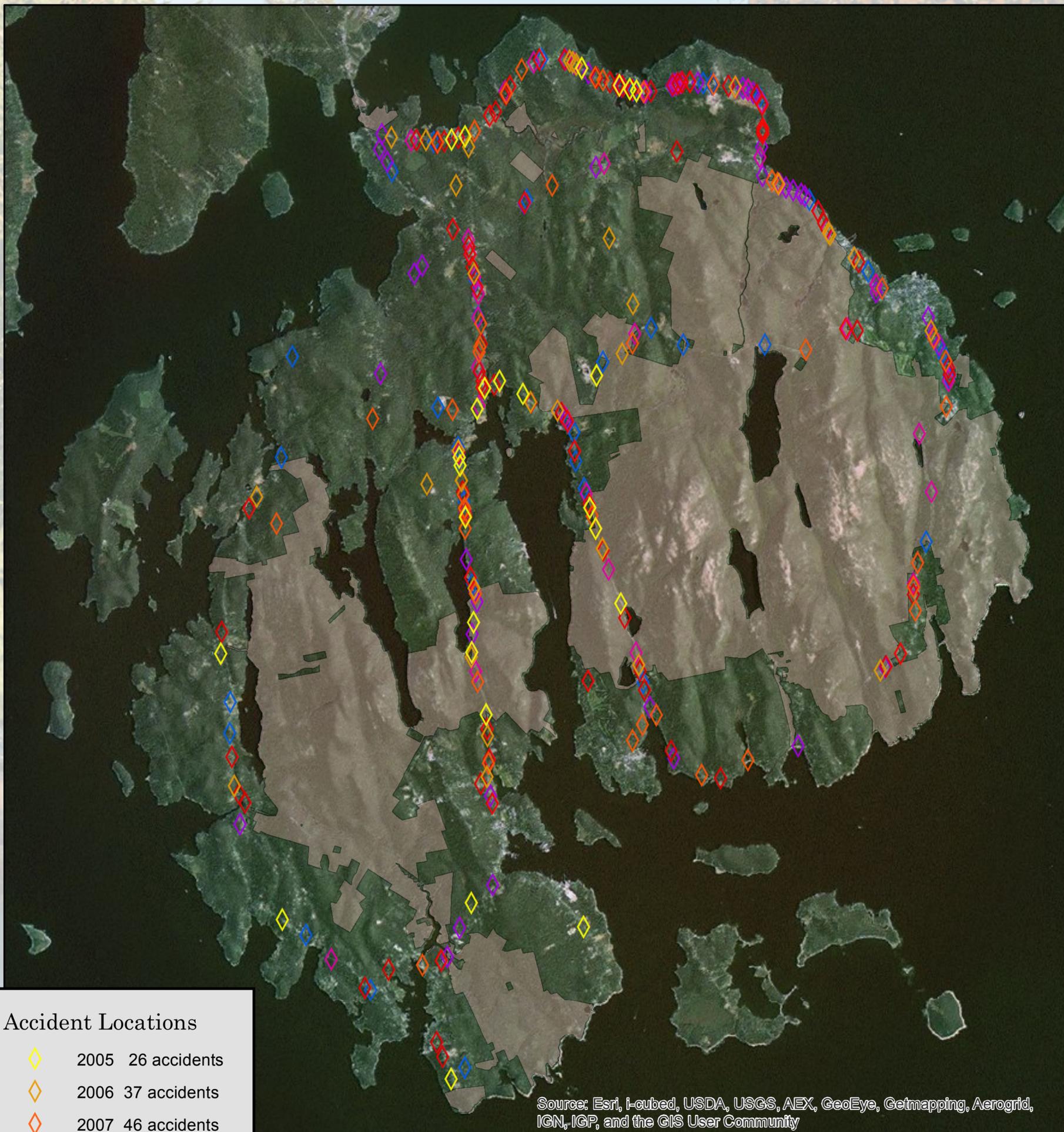
The above charts show the number of reported deer – car accidents and their distribution on roads on Mount Desert Island for the years 2005 - 2012. Between January 2005 and November 2012, there were 879 reported accidents. The roads with the most accidents are Route 3 with 2.5 accidents per mile, followed by Route 233 with 1.9 accidents per mile. Roads with fewer than 10 total accidents since 2005 are not shown in the chart on the right. Information for the charts came from ME DOT and the towns of Bar Harbor and Southwest Harbor records and was analyzed and prepared by COA student E. Georgaklis.

The towns of Tremont, Southwest Harbor, and Mount Desert have had 243 reported accidents since 2004, an average of 27 accidents per year. For these years, the highest number of accidents (35) occurred in 2009 and while the lowest reported number of accidents (17) occurred in 2010. In 221 (90.5%) accidents, deer died on impact or were euthanized in 152 (69%) accidents, deer ran from the accident scene in 60 (27%) accidents, and the remaining 9 (4%) deer were not hit but the car was damaged by efforts to avoid hitting the deer. From this information, deer have less than a 30% chance of surviving an accident with a car.

Deer-car accidents happen around the clock with no statistical difference between times of the day, yet the hour with the most accidents is 7am. The higher number of accidents at this time may be attributed to higher commuter traffic, low-light conditions from November through March, deer moving from forage areas to resting areas, and to other unknown factors.

In two years (2011 – '12), the towns of Mount Desert, Southwest Harbor, and Tremont had an average of 16 deer-car accidents annually, (with a total of 31 accidents) that were reported to have more than \$1000 worth of damage to the vehicle. For the same years, Bar Harbor had an average of 28 deer-car accidents annually, (with a total of 54 accidents), that reported more than \$1000 worth of damages estimated to vehicles in deer-car accidents.

Deer - Car Accidents with over \$1000 Damage, 2005 - 2012



Accident Locations

- ◇ 2005 26 accidents
- ◇ 2006 37 accidents
- ◇ 2007 46 accidents
- ◇ 2008 36 accidents
- ◇ 2009 53 accidents
- ◇ 2010 50 accidents
- ◇ 2011 56 accidents
- ◇ 2012 45+ accidents
- Acadia National Park

Source: Esri, I-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

Between 2005 and 2012, there were 348 accidents were reported on MDI. All accidents involved one or more deer and caused over \$1000 property or bodily damage. The accidents shown are those that were reported to DOT and DOT located the sites using a combination of nodes and streets.

0 0.5 1 2 3 4 Miles

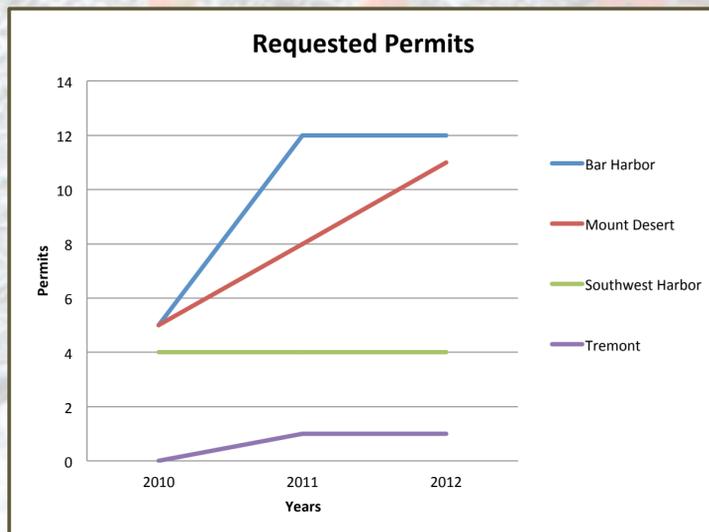


College of the Atlantic
Erica Georgaklis 2013

Depredation Permits

Maine statute authorizes IFW (Warden) to issue a depredation permit to a qualified individual landowner (or their designated agent) to take no more than two deer that are damaging crops, gardens, or orchards. The practice is a one-time management tool not to be used for the long-term management of deer.

Phil Richter, ME IFW Game Warden, provided that Park volunteer Shannon Wiggin used to prepare these graphs.



Over the past three years, the number of permits requested and the number of deer harvested have increased dramatically in both Bar Harbor and Mount Desert. Current as of January 2013.

