

AMBASSADOR ROOM

MONDAY AFTERNOON

ROOM: Ambassador

TIME: Monday 1:00 PM

TITLE: Sex-age selectivity and correlates of capture for winter-trapped white-tailed deer

AUTHOR(S):

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ABSTRACT: Despite the common use of Clover traps to capture white-tailed deer (*Odocoileus virginianus*), little published information exists quantifying trap success, trap selectivity (sex-age selection), or weather correlates of trap success. We quantified these relationships using white-tailed deer data from 3 study sites in the Lower Peninsula of Michigan during winters 2001–2007. We captured a total of 610 deer in 8,569 trap-nights, pooled capture success was 0.07 deer/trap-night, although site-year success varied from 0.021 to 0.086. We compared sex-age classes (fawn [pooled by sex], adult male, adult female) captured with sex-age classes estimated to be available on each study site during each capture season. We used generalized linear mixed modeling to construct 19 a priori models to describe probability of capture success as a function of weather covariates (daily minimum temperature [C], daily snowfall [cm], daily snow depth [cm]), Julian day, site, and year. General selection patterns included fawns captured more than expected and adult males captured less than expected, adult females were generally neutrally selected. The QAIC-best model within our set was described by the global model without Julian day, and contained all 3 weather covariates and site-year effects. Our model provided some evidence that as daily snow depth increased, probability of capture increased. The positive effect of daily snowfall on capture probability was dependent on decreasing daily minimum temperature. Our results should aid researchers and managers with expectations of success using Clover traps by increasing the efficacy of their deer capture programs.

KEYWORDS: deer, capture, selectivity

ROOM: Ambassador

TIME: Monday 1:20 PM

TITLE: Evaluating ungulate mortality associated with helicopter net-gun captures in the northern great plains

AUTHOR(S):

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ABSTRACT: During winter 2001 to 2006, we captured 208 white tailed deer and 281 pronghorn by helicopter netgunning throughout the Northern Great Plains. Twenty five of 281 pronghorn died from capture related injuries, of which 12 were from direct injuries sustained during capture and 13 occurred post release. Three of 208 deer died from injuries sustained during helicopter captures with no documented post release mortality. We used logistic regression to evaluate probability that ungulates would die of injuries associated with helicopter net gun captures by analyzing effects of snow depth, transport distance, ambient and rectal temperatures, pursuit and handling times, and whether individuals were transported to processing sites. Probability of capture related mortality postrelease decreased 58 percent when transport distance was reduced from 15 to 0 km, and by 69 percent when pursuit time decreased from 9 to less than 1 minute. Based on our analyses, we recommend eliminating animal transport and limiting pursuit time to minimize post release mortality rates. Also, we recommend that animal handling time be measured and incorporated into mortality models to increase understanding of animal handling on rates of capture related ungulate mortality post release.

KEYWORDS: mortality, netgun, ungulate

ROOM: Ambassador

TIME: Monday 1:40 PM

TITLE: Comparison of helicopter and forward-looking infrared surveys for counting white-tailed deer

AUTHOR(S):

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ABSTRACT: Monitoring deer abundance is an integral component of management, and traditionally has been accomplished by counting deer from helicopters. Helicopter counts are strongly influenced by snow cover, because deer detection rates are higher with a snow background. Forward looking infrared (FLIR) technology, which relies on the thermal contrast between deer and the environment, is often touted as a superior alternative to helicopter surveys because detection rates are believed to be higher and unaffected by snow cover. FLIR-based counts are increasingly replacing helicopter counts, however comparison of these two methods is lacking. We compared FLIR and helicopter counts, and assessed precision of FLIR and the influence of snow cover on these counts. We surveyed 5 plots: 4, 2-by-8 mile plots over free-ranging deer populations, and a 2-by-2 mile plot with a deer population contained by a high fence. All plots were surveyed using both FLIR and helicopters, both with snow cover and without snow. When snow was present, helicopter counts were much higher than when snow was absent. FLIR counts were generally precise, and were usually higher when snow was present. We found no consistent relationship between FLIR counts and helicopter counts, when snow was present. Our results indicate that FLIR counts may be superior to helicopter counts when snow is absent, but not when snow is present. FLIR counts appear to be influenced by environmental influences that are not well understood, and their value as an alternative to counting deer with visual observers over snow must be evaluated relative to project goals and environmental context.

KEYWORDS: FLIR, deer, surveys

ROOM: Ambassador

TIME: Monday 2:00 PM

TITLE: Testing a methodology to reduce the biases of road based distance sampling on a population of white-tailed deer

AUTHOR(S):

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ABSTRACT: One of the assumptions of distance-based line transects is that transect lines are located independently of animal distributions. The difficulties of detecting animals have forced researchers to violate this assumption placing transects along linear features such as roads. To reduce the biases from sampling from linear features we worked under the assumption that the over or under sampling of animals at various distances from a linear feature was proportional to the ratio of animals available at those distances. Thus data estimating the availability of animals from a linear feature could adjust density estimates. We used 4209 locations from 92 radio tagged deer to examine the distribution of animals from roads. This data was then used to adjust road based distance sampling. Our unadjusted population estimate of $n = 524$ was likely inflated. As expected using telemetry data to develop a theoretical distribution of deer and using this distribution to re-estimate the population shifted the population to $n = 492$. The strongest support for our proposed methodologies came from our estimates of a marked subset of the deer population that averaged 40 deer per week for a 4-month period. Our adjusted estimate of the population was $n = 38$ 95 % CI (29 - 49). Without adjusting the data we overestimated the population at $n = 53$ % CI (43 - 67). This study clearly shows that there is potential to use a radio-telemetry data to reduce the bias of distance sampling from roads or linear distance features.

KEYWORDS: distance, sampling, estimation

ROOM: Ambassador

TIME: Monday 2:20 PM

TITLE: Evaluating how hunters see and react to radio telemetry collars on white-tailed deer

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ABSTRACT: Radiotelemetry is a common method for estimating survival rates in populations of large animals. Despite precautions, radiotelemetry studies of hunted big game populations may be subject to a unique and complex bias associated with hunter reaction to the presence of radiotransmitter packages. To evaluate this potential bias we conducted an experiment using artificial deer to measure hunters' ability to see deer and radiocollars. We used logistic regression analyses to evaluate probabilities that seeing deer and subsequent radiocollars might be influenced by distance, percent visual obstruction, body orientation, hunter experience, and sex. Additionally, we evaluated how hunter experience and antler characteristics might influence hunter decisions to harvest a radiocollared deer. We interviewed 214 hunters, of which all 214 observed at least 1 of 3 available deer during observation periods whereas 47.2 percent of hunters observed a radiocollar placed on a deer. When asked whether they would harvest the deer they observed if it was wearing a radiocollar, hunters reportedly would have harvested 231 of 567 deer, of which 175 were antlered deer and 56 were antlerless deer. Probability of observing deer and subsequent radiocollars increased 200 percent and 317 percent, respectively, for each additional logyear of hunting experience. Probability of harvesting radiocollared deer increased 189 percent for each additional logyear of hunting experience, and 244 percent between antlerless and large antlered deer. When hunting is an important source of mortality, game managers and researchers should consider potential biases associated with hunter reactions to and subsequent decisions to harvest radiocollared deer.

KEYWORDS: bias, radiotelemetry, deer

ROOM: Ambassador

TIME: Monday 2:40 PM

TITLE: Effects of special antlerless only seasons on Wisconsin's deer harvests

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ABSTRACT: Effective management of wildlife populations often requires motivating hunters to harvest sufficient numbers of animals of prescribed sex and age classes to meet management goals. For cervids, it is convenient to design harvest regulations relative to the presence or absence of antlers because harvest of females has the larger effect on population growth. We used regression techniques to evaluate the effects of 3 supplemental antlerless-only hunting programs on the harvest of antlered and antlerless deer in Wisconsin. Earn-a-buck regulations, an incentive-based program that requires hunters to register an antlerless deer before being authorized to harvest an antlered deer resulted in an average 121 percent increase in antlerless harvest and a 25 percent decrease in harvest of antlered deer. Providing more opportunity for hunting of antlerless deer in the form of 8 and 4-day supplemental firearm seasons resulted in 51 and 40 percent increases, respectively, in antlerless harvest with trivial impacts to the harvest of antlered deer. Our analysis suggests that the earn-a-buck incentive was dramatically more effective at increasing antlerless harvest although it also resulted in decreased harvest of antlered deer and was disliked by hunters. Quantifying these relationships is important for helping managers predict the costs and benefits of various hunting programs.

KEYWORDS: earn-a-buck, deer, harvest

ROOM: Ambassador

TIME: Monday 3:40 PM

TITLE: Deer management in suburban landscapes

AUTHOR(S):

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Gabriel J Powers -- McHenry County Conservation District

ABSTRACT: The McHenry County Conservation District is a local government agency that manages over 25,000 acres in northeastern Illinois. The District has enjoyed strong public support, passing land acquisition referendums in 2001 and 2007 for a total of 141,000,000 dollars. The District began a comprehensive study of deer ecology in 1992. A firearm and archery deer hunting program was initiated in 2001 and 2002 respectively. The goal of the program was to provide recreational hunting, and to control deer populations with safety being the highest priority. Over the last eight years, various incentives and regulations have been utilized to maximize deer harvest while providing for public safety and public access. The District has the ability to utilize recreational hunting, management hunting, and sharpshooting based on the distance to occupied dwellings, deer density, public access, budget constraints, overall safety, and perceived quality of hunt. Success at achieving deer population goals has been variable. Average deer densities have been reduced on firearm hunting sites from 59 per square mile to 30 per square mile. Management hunting, utilizing archery equipment, has reduced deer densities from 54 per square mile to 44 per square mile on average. Recreational archery deer hunting has reduced deer densities from an average of 91 per square mile to 51 per square mile. In our experience, managers must be willing to utilize different hunting techniques and incentives to manage deer populations in suburban landscapes.

KEYWORDS: deer, management, hunting

ROOM: Ambassador

TIME: Monday 4:00 PM

TITLE: Socioeconomic and ecological correlates of bobcat harvest in Minnesota

AUTHOR(S):

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ABSTRACT: Management of game animals requires understanding which factors affect their harvest. Although influenced by international law, bobcat (*Lynx rufus*) management is largely the responsibility of state or provincial agencies and our understanding of the factors driving their harvest should be at a similar scale. We associated 33 years of bobcat harvest data in Minnesota with socioeconomic (e.g. pelt prices, license sales) and ecological variables (e.g. prey abundance, bobcat-specific index of winter severity) to determine which variables most closely influenced annual bobcat harvest. We constructed candidate generalized linear models based on an information-theoretic approach using all possible combinations of principal component predictor variables. Top-weighted models suggest that annual bobcat harvest in Minnesota is most influenced by (in order) 1) trapping season length, 2) mean bobcat pelt price, 3) relative abundance of lagomorphs, 4) number of trapping licenses sold, and, less notably, 5) our index of winter severity. Our results mirror those of other studies and suggest that bobcat managers can influence the annual harvest of bobcats. Furthermore, this study shows that bobcats may be susceptible to overharvest if managers do not account for expected increase in pelt prices resulting from burgeoning markets in Eastern Europe and Asia.

KEYWORDS: *Lynx rufus*, bobcat, harvest

ROOM: Ambassador

TIME: Monday 4:20 PM

TITLE: Multiple indices are better than one: A bayesian analysis of wildlife index data in Illinois

AUTHOR(S):

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ABSTRACT: Although wildlife managers utilize indices for monitoring changes in wildlife populations, most index methods lack rigorous assessments of their utility. We used Bayesian techniques to quantify trends for wildlife species indexed via the Illinois archery deer hunter survey (ADHS), including raccoons (*Procyon lotor*), coyotes (*Canis latrans*), and red foxes (*Vulpes vulpes*). We also assessed combining the ADHS with 3 additional index techniques used in Illinois, given 15 years of data (1992-2006) analyzed. For each species, we implemented a hierarchical model which included 3 terms (sampling effort, population change, and noise), and utilized Bayesian inference via Markov chain Monte Carlo simulations to analyze index trends. We examined the precision between ADHS estimates and combined-index estimates to determine if there was a benefit to combining methods to develop one overall index. To assess the increase in index efficiency, we used a comparison of the Bayesian credible intervals for individual indices versus the combined index. Due to the high variability present in the ADHS, the combined index improved precision for all species in which a trend was detectable. Using the ADHS alone, credible interval estimates varied around the posterior point index estimate for coyotes at 28%, raccoons at 23% and red foxes at 32%. For the combined index, credible interval estimates varied around the posterior point index estimate for coyotes at 19%, raccoons at 15%, and red foxes at 20%. We recommend wildlife biologists consider utilizing multiple indices to improve trend analysis for wildlife populations.

KEYWORDS: bayesian, index, trend

ROOM: Ambassador

TIME: Monday 4:40 PM

TITLE: Survival and Cause-specific mortality of riparian muskrats along a flashiness gradient

AUTHOR(S):

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ABSTRACT: Small streams and agricultural ditches provide key habitat for muskrats in the Midwest. However, nothing is known about how flow regimes and landscape context affect muskrat survival in riparian areas. We radiomarked 31 muskrats at 10 study sites in east-central Illinois and estimated survival along a hydrological flashiness gradient using known-fate models. During flooding events, muskrats were displaced from their burrows and moved to alternate upland sites where they were exposed to increased predation risk from terrestrial predators. Individuals at downstream sites, which drained larger areas, were displaced longer than animals positioned closer to the headwaters. Weekly survival estimates were higher in non-winter (0.977) than in winter (0.937), and muskrats had a 0.120 probability of surviving the duration of the 56-week study. Survival rate was related positively to width of the riparian vegetation buffer surrounding the stream. Position along the flashiness gradient did not affect muskrat survival. American mink were responsible for 80 percent of all known predation mortalities. Our results suggest that conservation buffer strips can be beneficial for riparian muskrats in an agricultural landscape.

KEYWORDS: riparian, muskrat, survival