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Program & Abstracts

89. SURVEYS OF THE MAMMALS OF NATIONAL PARKS IN COASTAL REGIONS OF MARYLAND AND VIRGINIA. Tressa L. Dolbeare, Heather P. Warchalowski, Dana T. Strang and Ronald E. Barry. Frostburg State University, Department of Biology, Frostburg, MD, USA.

The National Park Service (NPS) has identified the need for surveys of mammals in national parks in the Northeast Region as part of its Natural Resource Inventory and Monitoring Program. The objective of Phase I of the inventory is to document the presence of at least 90% of all mammal species in the parks. To supplement historical records we initiated 2-year field surveys of mammals in March 2002 in Thomas Stone National Historic Site (THST) in Maryland and Colonial National Historical Park (COLO) and George Washington Birthplace National Monument (GEWA) in coastal regions of Virginia. Grids, transects, or arrays of Sherman, Tomahawk, and pit-fall traps were used to sample small mammals. Larger mammals were observed directly, identified from sign, and/or sampled with Tomahawk traps and remote cameras. To date field surveys have documented 13 species of mammals at THST (all new records), 22 at GEWA (6 new records), and 20 at COLO. In all 3 parks the white-footed mouse (*Peromyscus leucopus*) was the most abundant small mammal in forested habitats. In COLO the marsh rice rat (*Oryzomys palustris*) was captured frequently in marsh, wetland, and forested wetland habitats. Also of significance was the capture of a hispid cotton rat (*Sigmodon hispidus*) in COLO, only the 2nd record of this species in the park near the northeastern extreme of its range. At GEWA species diversity was greater in grass and crop fields than in forested habitats. A project on comparative demographics of *P. leucopus* in different patch types is nearing completion in GEWA. Two additional projects in COLO are being conducted on small mammal responses to invasive Japanese stilt grass (*Microstegium vimineum*) and small forest gaps. Forthcoming analyses will provide additional information on species abundance, distribution, and habitat-specific diversity useful in the park monitoring program.

90. USING MICROSATELLITE DNA TO DETERMINE THE MATING SYSTEM OF WOODCHUCKS (*MARMOTA MONAX*). Melissa Duron, Christine R. Maher and Mandi Greenleaf. Department of Biological Sciences, University of Southern Maine, Portland, Maine.

Group size and degree of sociality can influence mating systems. Ground dwelling sciurids, in which social organization ranges from mostly asocial to highly social, have varying levels of extra-pair copulations and multiple paternity. Researchers believe woodchucks (*Marmota monax*) display polygyny, but based on observations of other sciurids with comparable levels of sociality, woodchucks may show promiscuity, too. Yet, no one has investigated their mating system in detail. Because woodchucks usually copulate underground, it is difficult to determine their breeding behavior through observations alone. Therefore, I used microsatellite DNA from hairs obtained during an ongoing, long-term behavioral study to investigate if woodchucks from a high-density population in Falmouth, Maine are polygynous, polyandrous or promiscuous. I ascertained 2-10 alleles for at least 6 loci and analyzed my data with GENESCAN® and GENOTYPER®. I will present data from at least 6 litters sampled over 4 years showing genetic relationships of woodchucks and determine whether litters were multiply sired. In addition, I will gain insight into woodchuck mating systems, which will aid in other sciurid sociality studies.

91. COMMUNAL NESTING AND KINSHIP AMONG DEGUS (*OCTODON DEGUS*). María José Hurtado¹, Mauricio Soto-Gamboa^{1,2}, Eileen A. Lacey³, Ann T. Chang³ and Luis A. Ebensperger^{1,2}. ¹P. Universidad Católica de Chile, Departamento de Ecología, Casilla 114-D, Santiago, RM, Chile; ²Centro de Estudios Avanzados en Ecología & Biodiversidad, Casilla 114-D, Santiago, RM, Chile; ³University of California, Department of Integrative Biology, Museum of Vertebrate Zoology, Berkeley, California, USA.

Communal nesting may confer both direct and indirect benefits

upon individuals that live together and share a nest site. Observations of captive degus (*Octodon degus*) indicate that multiple females nest together, even when supplied with several nest boxes. To determine if free-living degus engage in communal nesting, we used radiotelemetry to monitor patterns of nighttime nest use by females in this strictly diurnal species. These analyses revealed that females formed stable nesting associations of at least 2-4 individuals. Most such associations used more than one nest site; nest sites for the same nesting association tended to be located in close proximity to one another relative to sites used by other associations. To assess kinship among group mates, tissue samples collected from our radiocollared animals were genotyped at six microsatellite loci. These analyses revealed that mean pairwise relatedness among members of a nesting association ($r = 0.25$) was significantly greater than the mean relatedness among randomly selected pairs of females ($r = -0.03$). Our results confirm that free-living female degus are communally nesting and indicate that allonursing of young is possible, as are indirect fitness benefits associated with shared nest use.

92. COSTS AND BENEFITS OF COMMUNAL NESTING TO FEMALE DEGUS (*OCTODON DEGUS*). María José Hurtado² and Luis A. Ebensperger^{1,2}. ²Pontificia Universidad Católica de Chile, Departamento de Ecología, Casilla 114-D, Santiago, RM, Chile; ¹Centro de Estudios Avanzados en Ecología and Biodiversidad, Santiago, RM, Chile.

Communal nesting may determine costs and benefits to individuals that live together and share a nest site. In rodents, the examination of such costs and benefits have yielded contradictory results, mainly because laboratory studies have kept subjects under optimal conditions. Multiple females of degus (*Octodon degus*) nest together in the lab and in nature. We examined the effect of communal nesting on the intake of milk and growth of degu offspring, and the physical condition of females under challenging conditions of temperature and food supply. Three social conditions were tested: solitary breeding females, breeding females nesting with a non-breeding female, and breeding females nesting with another breeding female. Communal nesting did not influence milk intake by degu pups, but pups of females nesting with a non-breeding female were heavier at weaning (days 27 and 31 of lactation). On the other hand, we found no evidence that communal nesting influences physical condition of dams: loss of mass by females did not differ with social condition. Our preliminary data set suggests that some moderate benefits may be accrued by breeding females that communally nest with non-breeding females. Current research is being carried out to confirm these findings.

93. COMPARISON OF CAPTURE SUCCESS BETWEEN SHERMAN FOLDING TRAPS AND MUSEUM SPECIAL SNAP TRAPS. Kevin G. Eulinger and Scott Burt. Truman State University, Kirksville, MO.

Small mammals were trapped at Swan Lake National Wildlife Refuge using Sherman folding traps and museum special snap traps in five distinct habitat types. 1099 small mammals representing 10 species were captured in 6400 trap nights. Capture success was directly compared between the two trap types and capture success between the two trap types was considered for the variables of sex, habitat site and species. In general, museum special snap traps were significantly more successful in capturing small mammals than Sherman folding traps ($P \leq 0.002$). Sex was not a significant factor in capture success in this study, as Sherman folding traps and museum special snap traps were equally likely to capture males and females ($P \leq 0.3442$). Habitat site was a significant factor in determining capture success between the two trap types. The Sherman folding trap was significantly more successful in the agricultural field site ($P \leq 0.0001$); however, the museum special snap trap was significantly more successful in the forest ($P \leq 0.0003$) and grassland ($P \leq 0.0001$) sites. Species affinity was also a factor in capture success in this study. The western harvest mouse was significantly more likely to be captured in museum special snap traps than Sherman folding traps

($P < 0.05$). The museum special snap trap was sprung-but-empty significantly more than Sherman folding traps ($P \leq 0.000$).

94. LOCOMOTOR PERFORMANCE AND COST OF TRANSPORT IN THE SQUIRREL GLIDER AND SUGAR GLIDER. Elizabeth A. Flaherty¹, John S. Scheibe² and Ross Goldingay³. ¹Dept. of Zoology and Physiology, University of Wyoming, Laramie, WY, USA; ²Dept. of Biology, Southeast Missouri State University, Cape Girardeau, MO, USA; ³Dept. of Environmental Studies and Management, Southern Cross University, Lismore, NSW, Australia.

Data collected from field glides of *Petaurus norfolcensis* in southern Queensland, Australia and laboratory glides of *P. breviceps* were used to assess locomotor performance and the cost of gliding transport for these marsupial gliders. The cost of running and climbing transport was also computed and compared to the cost of gliding in an effort to estimate cost effective glide distances, and determine if gliding is cost effective in this species. Results indicate that gliding is not less expensive than quadrupedal locomotion. These findings do not support the hypothesis that gliding evolved as a means of energy conservation.

95. INTRODUCTION OF A LOW-COST REMOTE WILDLIFE CAMERA AND NOVEL TECHNIQUES FOR OPERATION. Mourad W. Gabriel and Greta M. Wengert. MGW Biological Surveys, Bayside, CA, USA.

Game cameras have been used for a variety of wildlife monitoring and research projects. The commonly used Trailmaster 550 passive infrared sensor (PIR) with a TM 35-1 camera game camera setup can cost upwards of \$500. One camera that has been underused is the GSM Stealth Cam model MC2-G. The cost of this camera (\$60-\$70) is a fraction of traditional trail cameras and contains many of the same features in addition to being housed in a weatherproof/impact resistant housing. Current budget constraints limit mass placement of trail cameras and therefore place a limit to the area a researcher is able to monitor. For a large-scale forest carnivore survey project in the Sierra Nevada mountains of northwestern California, we used 42 MC2-G trail cameras placed a minimum of 1.6 kilometers apart for a total of 1446 camera nights. A variety of novel techniques were implemented to minimize animal damage, which included the use of an activated carbon spray (ACS) to absorb any stimulating odors. Throughout the study, cameras were sprayed with ACS and only two cameras sustained animal damage but remained in operable condition. The use of small desiccant packages helped eliminate any potential water/humidity damage or corrosion due to opening cameras in adverse conditions to change film or batteries. Additional new and previously used camera survey techniques were used throughout this project, yielding minimal camera damage, minimal lost survey days, and effective photo capture of forest mammals.

96. AGE SPECIFIC TIME BUDGETS OF THE ENDANGERED MOUNT GRAHAM RED SQUIRREL. Vicki L. Greer and John L. Koprowski. University of Arizona - School of Renewable Natural Resources, Tucson, Arizona, USA.

Time budgets can provide insight into strategies employed by animals to maximize fitness, how these strategies may change under varying ecological conditions, and how groups within a population may differentially respond to these conditions. A time budget for the endangered Mt. Graham red squirrel was constructed from focal animal behavioral observations made from 1989 through 1991. For adult red squirrels, food acquisition and resting behaviors accounted for a large proportion of observed behaviors. The proportions varied between reproductive groups and through seasons. Adult Mt. Graham red squirrels apportion their time similarly to other non-endangered populations of squirrels. However, little is known about time allocation of juvenile and sub-adult red squirrels. Herein, we also examine the behavior data to construct time budgets for juveniles under maternal care and independently living sub-adult squirrels. These

time budgets are compared to those of adult red squirrels to determine differences among the age groups.

97. HOME RANGE AND HABITAT USE OF A TRANSLOCATED POPULATION OF RIPARIAN BRUSH RABBITS. Laurissa P. Hamilton^{1,2}, Daniel F. Williams¹, Patrick A. Kelly¹ and Douglas A. Kelt². ¹Endangered Species Recovery Program, California State University-Stanislaus, Fresno, CA, USA; ²Department of Wildlife, Fish, & Conservation Biology, University of California, Davis, Davis, CA, USA.

The endangered riparian brush rabbit (*Sylvilagus bachmani riparius*) occupies areas of dense, brushy cover along streamside communities in the San Joaquin Valley of central California. Only four extant populations are known; all are small, isolated, and at risk of extinction from demographic stochasticity, flooding, wildfire, disease, predation, and habitat degradation and conversion. A 5-year controlled propagation and translocation program has been initiated to re-establish populations of riparian brush rabbits to restored habitat within their historic range. Between August 2001 and the fall of 2002, three 0.5-ha enclosures were constructed around natural vegetation for captive propagation. In fall 2001, six rabbits (3F, 3M) were bred in one pen and in fall 2002, all three pens were used (6/pen; 3 of each sex). Sixty-five offspring (36F, 29M) were produced in 2002 and 275 (128F, 147M) in 2003. In July 2002, we translocated the first of the captive-reared rabbits to the San Joaquin River National Wildlife Refuge. There were 9 subsequent releases between August and October 2002, totaling 49 rabbits. Released rabbits were radio-tracked at least twice weekly to monitor their survivorship and movements. Seven of the 49 translocated rabbits did not survive long enough to provide spatial information. Of the remaining 42 individuals (21 F, 21M), about half of each sex remained within 500 m of the release enclosure. The remainder made long, one-way movements within the refuge. The longest movements were 1.5 km and 2.2 km for female and male rabbits respectively. Preliminary analysis of 2002 data indicates an average home range size of 2.12 ha for females and 5.35 ha for males. Fifteen releases of 190 individuals were made during 2003 and a subset of 40 individuals has been selected for intensive monitoring.

98. RELATIVE CAPTURE EFFICIENCY OF STANDARD AND LONG SHERMAN LIVE TRAPS. Dana H. Hogan¹, Jennifer M. Duggan¹, Cheryl Brehme² and James E. Diffendorfer¹. ¹SDSU Department of Biology, San Diego, CA, USA; ²U. S. Geological Survey Western Ecological Research Center, San Diego, CA, USA.

We compared the effects of Sherman live trap length (standard: 22.9 cm and long: 30.5 cm) on the number and sex ratio of 3 small mammal species in southern California coastal sage scrub habitat. The large eared woodrat (*Neotoma macrotis*) and cactus mouse (*Peromyscus eremicus*), as well as California mouse females (*Peromyscus californicus*), were captured more often in long traps. Results suggest greater relative capture efficiency of long traps is due primarily to trap design and may result in larger sample sizes and thus a greater likelihood of unbiased population size estimates.

99. EFFECTS OF PRIOR LIVE TRAP OCCUPANCY ON SUBSEQUENT CAPTURE OF MEADOW VOLES. Joe Jacquot and Jessica Dutzy. Biology Dept., Grand Valley State University, Allendale, MI.

We carried out a mark-recapture project with meadow voles during summer 2003. We established four live trapping grids that were monitored for nine weeks as part of a larger study. Our goal was to determine if gender or age of captured voles affected subsequent captures. A second goal was to determine if voles avoided traps previously having captured a potential predator. We logged over 3,000 captures of seven species during the study period. The majority of captures were meadow voles (94%). Voles generally avoided traps that had previously held a predator or a same-sex conspecific. Prior capture of opposite-sex conspecifics had a positive impact on subsequent captures. This effect was mainly from females entering traps

lok¹ and Terry J. Doonan². ¹Natural History Museum and Department of Ecology and Evolutionary Biology, The University of Kansas, Lawrence, KS, USA; ²Florida Fish and Wildlife Conservation Commission, Lake City, FL.

We provided supplemental food to hispid cotton rats (*Sigmodon hispidus*) in northeastern Kansas and tested whether they restricted their movements and whether females reduced movements more than males in the presence of additional food. We estimated movements as the mean squared distance from the centroid of locations for each individual, and tested for changes in movements on 2 time scales using mark-recapture data. Movements within a 3-day interval varied with sex, season, and reproductive condition, but we found no significant changes in response to supplemental food nor did the genders vary in response. Earlier work had shown that females produced larger mass-specific litters and young grew more rapidly with supplemental food, so females seemed to be able to acquire additional resources with no increase in home range size. Movements over an individual's entire 1-6 month tenure on our area decreased with added food. Hence, we found no strong evidence that adding food at regularly spaced, point sources influenced daily movements, but did find that it reduced the tendency of individuals to shift centers of activity over longer time intervals.

326. PRAIRIE VOLES IN EASTERN KANSAS: ARE THEY ALSO MONOGAMOUS? Nancy G. Solomon and Paula Hogan. Department of Zoology, Miami University, Oxford, OH, USA.

A powerful approach to studying social systems is to examine intraspecific variation. We tested the hypothesis that differences in ecological factors result in intraspecific variation in the social system of prairie voles, *Microtus ochrogaster*. The distribution of prairie voles includes areas that differ ecologically with respect to climate and vegetation. Also the characterization of prairie voles as monogamous has been based on data from east-central Illinois, however evidence from Kansas suggests that there may be an alternative mating system in that geographic area. We used methods similar to those used by Getz and colleagues to examine the social organization of prairie voles from Kansas. A small percentage of adult males and females were trapped together repeatedly. Fewer males and females were caught together more than once as compared to male-female pairs from Illinois. More males and females from Kansas were captured with different opposite-sex conspecifics, compared to recaptures in Illinois. Analysis of social units showed that there were fewer male-female pairs (1 adult male-1 adult female with or without offspring) than found in Illinois. Forbs are less abundant and more clumped in Kansas than in Illinois. Thus, males may be able to overlap with multiple females more easily in Kansas, resulting in social polygyny.

327. TEST OF THE FIRST COHORT ADVANTAGE HYPOTHESIS WITH FEATHERTAIL GLIDERS (MARSUPIALIA). Simon J. Ward. Department of Zoology, University of Melbourne, Melbourne, Victoria, Australia.

The first cohort advantage hypothesis (FCAH) was formulated to explain patterns of biased sex ratios in litters of Virginia opossums. This species typically produces two litters each season, and litters born early in a season are more likely to be male-biased and those born later in the season, female-biased. Males born earlier are older and heavier in the next breeding season and likely to secure more mates. The hypothesis predicts fitness benefits to mothers that have more males in their first litter (the first cohort) each season. The feathertail glider in Victoria, Australia, is another species that produces two litters per year and not all males mature before the start of the breeding season following their birth. Hence, feathertail gliders might also be expected to show a pattern of sex bias in litters consistent with the FCAH. They do not. This paper uses data from two field studies of feathertail gliders in Victoria over the past 18 years. Sex ratios were recorded for 53 first and 42 second cohort litters. There was a trend towards male-biased litters in the first cohort, but also in the second, and neither group differed significantly from a binomial distribution of sex ratios. This provides no support for the

FCAH in this species. This may be due to the much less-sharply defined breeding seasons in feathertail gliders, compared to those of Virginia opossums, and to their greater longevity.

328. SEX-RELATED DIFFERENCES IN NURSING BEHAVIOR BY ROOSEVELT ELK. Greta M. Wengert. MGW Biological Surveys, Bayside, CA, USA.

Maternal investment in mammals varies throughout the nursing period and also between individuals. In some species, level of maternal investment differs between the sexes of the offspring. Maternal investment by Roosevelt elk (*Cervus elaphus roosevelti*) mothers at Sinkyone Wilderness State Park, Mendocino County, California was analyzed through measuring nursing behaviors from May 25 through November 6, 2000 with respect to calf age and calf sex. Five measures of nursing behavior of eight Roosevelt elk calves were used as indicators of maternal investment and calf suckling persistence. Mean suckling rate (seconds suckling/ hours of observation) ($p=0.008$), mean suckling time per bout (seconds suckling/ bout) ($p=0.048$), and the proportion of suckling bouts initiated by the mother ($p=0.038$) all decreased with increasing calf age. Only 4 of 48 suckling bouts were terminated by the calf. Mean suckling success (number of successful suckling attempts/ number of successful + unsuccessful suckling attempts) did not significantly decrease with increasing calf age ($p>0.05$), nor did suckling attempt rate (suckling attempts/ hours of observation) ($p>0.05$). Only mean suckling time per bout was different between the sexes and was greater for males ($p=0.049$). Sexual differences in nursing behavior were more apparent in the early nursing period, and this may be the only period in which these differences are important.

329. DISTRIBUTION AND PREVALENCE OF FACIAL TUMOR DISEASE IN TASMANIAN DEVILS. Marco Restani¹ and Nick Mooney². ¹Department of Biological Sciences, St. Cloud State University, St. Cloud, MN, USA; ²Nature Conservation Branch - DPIWE, Hobart, Tasmania, Australia.

A newly discovered disease, first noticed by a wildlife photographer in 1996, is causing cancer among Tasmanian devils (*Sarcophilus harrisi*). Tumors, possibly viral in origin, are produced about the face and debilitate infected devils, leading to death in a few months. We surveyed devil populations across Tasmania from July-November 2003 to determine the distribution and prevalence of the disease. We set 30 traps for one night at each of 40 study areas. We captured 101 devils, of which 18 possessed morphological characteristics consistent with the disease. Older devils, usually males, appeared to display symptoms first, followed by older females and then juveniles. In areas where the disease has apparently run its course, population declines approached an estimated 90%. We recorded the disease in devil populations across the eastern half of Tasmania. Only young devils were captured in these areas. In contrast, unaffected populations in western Tasmania maintained a relatively even distribution of age classes. The disease is of significant conservation concern not only for its effects on devil populations, but also because illegally introduced red foxes (*Vulpes vulpes*) may now benefit from reduced competition for resources.

330. WHAT DO INDIANA MYOTIS DO WHEN THEY LOSE A ROOST? Dale W. Sparks, Christopher M. Ritz and John O. Whitaker. Department of Life Sciences, Indiana State University, Terre Haute, Indiana.

We examined how loss of a primary roost impacted the federally-endangered Indiana myotis (*Myotis sodalis*). A roost tree that had been extensively used since at least summer 1996, was found on the ground on 8 January 2002. To evaluate the impact of losing of this roost, we compared patterns of roost use, geographic distribution of roosts, and locations of Indiana myotis captures before and after the roost fell. Prior to the collapse of the roost, bats concentrated their roosting in the tree that was lost, but also used other trees within the same complex of woodlots, and occasionally in other parts of the study area. After this roost was lost, the bats were more dispersed

both in terms of the number of roosts they used, and geographic locations of those roosts. Although two new roosts received the majority of use by bats after loss of the old primary roost, fewer bats used the new roost. These data indicate that loss of an important roost can lead to noticeable changes in the behavior of a bat colony, even for tree-dwelling bats.

331. CONSERVATION AND RECOVERY OF THE RIPARIAN WOODRAT UNDER PRESSURE FROM AN EXOTIC COMPETITOR, THE BLACK RAT. Karen L. Sproull^{1,2} and Patrick A. Kelly¹. ¹California State University, Stanislaus, Endangered Species Recovery Program, Fresno, CA; ²California State University, Fresno, Biology Department, Fresno, CA.

The gold rush of 1849 initiated in California a period of settlement and land conversion that continues to this day. In the San Joaquin Valley of Central California, wetland, riparian, and upland communities were largely converted, predominantly for agricultural uses. Riparian woodrats (*Neotoma fuscipes riparia*) were characteristic of brushy, riparian communities in the northern San Joaquin Valley but by the late 20th century, only one extant population was known, in Caswell Memorial State Park on the Stanislaus River near Ripon, California. Consequently, the riparian woodrat was listed as an endangered species by the U.S. government in 2000. In recent years, biologists have located two other populations of woodrats in the northern San Joaquin Valley but they also documented high population densities of black rats (*Rattus rattus*) in the areas occupied by woodrats. This observation led to the hypothesis that resource and/or interference competition from black rats may be influencing the distribution and abundance of woodrats. A two-year study of riparian woodrats and black rats was initiated in fall 2002 in Caswell Memorial State Park. Two study sites were selected as far away from each other as possible within the park. Black rats are continuously removed from one of the sites and woodrats are monitored using live-trapping and radiotelemetry at both sites. Black rats are also monitored in the non-removal area. The results from 2003 suggest that female woodrats have higher reproductive success in the black rat removal area. More definitive results will be provided using demographic and movement data that will be collected through summer 2004.

332. COUGAR-HUMAN INTERACTIONS: MOVEMENT PATTERNS AND BEHAVIOR ALONG THE URBAN-WILDLAND INTERFACE. Michael L. Wolfe and David C. Stoner. Dept. of Forest, Range, & Wildlife Sciences, Utah State University, Logan, UT, USA.

Potential conflicts between cougars (*Puma concolor*) and humans arise from the spatial overlap and complex interaction of behaviors on the part of both species. Apart from exploitation, the primary human impact on cougars is habitat modification due to urbanization. Conversely, cougar impacts on humans stem principally from foraging and dispersal behaviors near urban areas. In the western United States' urbanization adjacent to public lands has occasioned the juxtaposition of human communities and wildlife habitat. Agricultural lands buffering cities are disappearing as a result of urban sprawl, while public lands contain private inholdings subject to development. In addition to seasonal elevational migrations, irrigation and associated landscaping around homes may bring ungulates into foothill regions, thereby attracting cougars to areas of human activity. These interactions may be further complicated by hunting systems that modify the sex and age composition of the cougar population, resulting in populations with a higher proportion of potential nuisance animals. We have been monitoring a cougar population in the Oquirrh Mountains of north-central Utah since 1997. The population is subject to minimal hunting kill and occupies an area with moderately high prey densities on the western terminus of the Great Salt Lake Valley. The area is characterized by rapid suburban expansion, which will continue during coming decades. Residential development in the area comprises two variants: (1) low-density ranchettes bordering public lands; and (2) conversion of former agricultural lands into high-den-

sity planned communities. Here we examine the implications of these scenarios in light of cougar movement patterns, feeding behavior, and habitat use determined from GPS telemetry. We argue that the two development models pose differential risks for negative interactions between humans and cougars. Alternatives for managing cougars on the urban-wildland interface are also discussed.

333. GENETIC EVALUATION OF AN AMERICAN MARTEN REINTRODUCTION. L. Robert Peters and Bradley J. Swanson. Department of Biology, Central Michigan University, Mount Pleasant, MI, USA.

Reintroduced populations are often of smaller size and more isolated than normal populations. These factors can result in genetic problems even if the reintroduced populations are demographically successful. Long-term persistence of a population is more likely in systems with greater amounts of genetic variation. In this paper we examine the genetic health of the demographically successful reintroduction of marten *Martes americana* into the Upper Peninsula of Michigan. We found that the Michigan martens had higher allelic diversity ($A = 7.4$) when compared to Canadian populations ($A = 5.7$) and similar levels of heterozygosity ($H_{\text{Canadian}} = 0.626$, $H_{\text{Michigan}} = 0.632$). We suggest that the genetic success of this reintroduction is a result of the multiple reintroductions and subsequent translocations performed within the Upper Peninsula, which mimicked dispersal.

334. CONSERVATION AND CONTROVERSY WITH INTRODUCED BISON ON SANTA CATALINA ISLAND, CALIFORNIA. Rick A. Sweitzer¹, Juanita M. Constible² and Dirk H. Van Vuren³. ¹Department of Biology, University of North Dakota, Grand Forks, North Dakota, USA; ²School of Renewable Natural Resources, Louisiana State University, Baton Rouge, Louisiana, USA; ³Department of Wildlife, Fish, and Conservation Biology, University of California, Davis, California.

Millions of American bison (*Bison bison*) roamed across prairies and other habitats of North America before intensive hunting decimated the species. Conservation efforts in the early 1900s narrowly averted extinction by intensive management and reintroductions to parks and natural areas. Bison have wide ecological tolerances and some populations now occur outside of their historical range including on Santa Catalina Island, California. Between 1924 and 1935 23 bison were introduced to Santa Catalina Island. Under protective management the small herd grew until nearly 400 bison roamed the island in 1969 when a culling program was implemented to reduce herd size. Native fauna of Santa Catalina Island did not include large ungulates and there has been concern that the introduced bison are impacting native and island endemic species. Removing or reducing the herd is controversial, however, because bison are culturally significant and important for tourism. We examined multiple aspects of the population ecology of bison on Santa Catalina Island from January 2001 to December 2003 and developed models for estimating bison stocking levels under different management scenarios. Multiple island-wide censuses indicated the bison population grew at an estimated lambda of 1.2 during the study. Adult pregnancy rate was estimated at 0.50 and bison focused their activities around grassland and coastal sage scrub habitats where they consumed mostly grasses and forbs. Data on forage production suggested the island could maximally support 378 bison but only without consideration of diet or habitat needs of native species. Around 180 bison could be supported when some aboveground forage production was retained for native species. We recommend eventually reducing and restricting bison to a smaller area of the island popular for tourism, which would protect most of the known sensitive ecological areas on the island.

335. SELENIUM ACCUMULATION IN SMALL MAMMALS ON RETIRED AGRICULTURAL LANDS IN THE SAN JOAQUIN VALLEY, CALIFORNIA. Curtis E. Uptain¹, Stephen L. Lee², Steve R. Messer¹, Darren P. Newman¹ and Patrick A. Kelly¹. ¹California State University Stanislaus, Endangered Species Recovery