2001 END OF YEAR REPORT
WILDLIFE MANAGEMENT ACTIVITIES
SMALL MAMMAL AND AVIAN SPECIES ELEMENT

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OVERVIEW:

This was the first complete year that wildlife management activities were divided between the two staff biologists. Fisheries and large mammal activities will be reported on separately. This report will describe management activities for avian species and small mammals.

Most of the activities and fiscal expenses in 2001 involved prairie dog and short-grass ecosystem management. Other major management activities included bird censuses and small mammal surveys for the Preble's meadow jumping mouse. One FTE wildlife specialist, one seasonal wildlife technician and three separate seasonal wildlife technicians specializing in prairie dog management efforts completed these activities. Additionally, more than 20 volunteers assisted in the prairie dog management efforts and bird surveys. One seasonal wildlife technician position began part-time on March 29th and then continued at full-time status until December 31st. Three seasonal wildlife technician positions working on the prairie dog project began full-time duty on April 30th and continued until November 9th.

The wildlife specialist responsible for prairie dog management issues worked with a multi-jurisdiction task group to plan and implement a black-tailed prairie dog management symposium and workshop in Fort Collins during February. This workshop enabled BCPOS to take a formidable role towards helping other entities develop prairie dog management policies and address these issues in their own jurisdictions. Recent concerns about the management of this species within Front Range communities has increased following the decision by the U.S. Fish and Wildlife Service to consider the species as warranted but precluded from formal listing as a threatened species. This species is still a candidate species for future listing. The Service has mandated that the state of Colorado regularly monitor prairie dog populations and management activities in the state. These actions outside of Boulder County have increased the number of inquiries from the general public, private land developers and municipal administrators and officers to the Wildlife Specialist regarding this species. Our participation in this workshop has enhanced the reputation of BCPOS as a progressive manager of wildlife resources in this region. It has also given some necessary information to those entities with prairie dog habitat and populations that need to resolve their concerns without involving BCPOS.

Accomplishments in 2001 were not limited to monitoring and management activities. Time was spent responding to numerous inquiries from the general public and from municipalities about wildlife issues on non-BCPOS property. The Wildlife Specialist has also been working with multiple-agency committees to develop a statewide management plan for prairie dog conservation that would include Boulder County and on a county plan for Preble's meadow jumping mouse protection.

PROJECTS:

MAMMALS

Prairie Dogs

Status:

The recovery of the local prairie dog population from the last devastating plague epizootic event of 1995-1996 has been very strong. As a result, populations on BCPOS properties have increased greatly in the past few years. There are currently 120 distinct colonies on 56 separate parcels of property. These colonies range in size from less than 0.25 acres at many locations to 200 acres on the Platt/Centennial property. Total active acreage on BCPOS land at the end of 2001 has increased over 300% since data was collected in 1998 (Table 1)(Fig. 1). Active colony acreage on HCA areas alone has increased almost 800% since 1998 (Table 1). As a result, 25% of available habitat acreage on our HCA sites is currently occupied. The existing prairie dog management plan calls for occupancy of no more than 20 to 25% of available HCA habitat at any given time. This percentage was set to allow for the ecological needs of other grassland species which do not favor prairie dog-modified habitat and to allow for the recovery of vegetation from the intense grazing of prairie dogs when colony locations shift over time.

Currently, the limit of acceptable occupancy on the total acreage of HCA habitat is rapidly being reached. Some HCA locations, such as Rabbit Mountain, have already reached this outer limit. The relocation efforts of the past 3 years to Rabbit Mountain and the Southeast Buffer HCA sites have resulted in rapid re-population of these sites at rates that exceed the growth on the MOA sites. The intention of these relocation efforts was to remove the colonies on NPD sites and establish them on HCA sites, essentially transferring this occupied acreage to manageable locations. The goal of removal from NPD sites has not been successful to that end. Most of these removal sites have retained or recruited prairie dogs back onto them. The result has been no net reduction in active colony acreage on NPD sites since initiating this management activity. In fact, the acreage of active colonies on NPD areas has almost doubled since 1998 despite considerable removal efforts from NPD properties since then (Table 1).

There currently are no know accurate models for determining actual numbers of prairie dogs on open space in Boulder County. Existing models that calculate populations of large contiguous complexes using burrow counts are not accurate in the fragmented landscape of Boulder County. High variation in burrow densities, vegetation composition, and artificial constraints to dispersal has led to a very patchy and variable situation between colonies. The result is excessive statistical variance in measurements between colonies that exist under very different environmental conditions. This does not allow for the successful modeling of the population based on burrow counts. Local, accurate population assessments can only be obtained by counting each colony, a process that takes at least 3 days per colony. This effort would be prohibitive, given the limited staff time available for such an activity.

Nonetheless, there is a continuous request for some calculation of the actual numbers of prairie dogs on county open space lands. In an attempt to provide an answer, the density figures derived by Meaney and Associates during their monitoring of a control site and release sites have been used to calculate a range of possible population estimates in 2001. It was determined that

observable densities in this study represented approximately 60 % of the actual population on these sites, due to the fact that not all prairie dogs are above ground at any time. Using this factor, the calculated densities ranged from a low of 4.5 prairie dogs/acre in March to a high of 16 prairie dogs/acre in June. Average values were 7.2 prairie dogs/acre in March and 9.8 prairie dogs/acre in June (Table 2).

Based on these average values, there could have been approximately 17,500 prairie dogs on county open space in March, when populations would be a their lowest, and approximately 24,000 in June, when populations are highest following emergence of young. If calculated on the high value of 16 prairie dogs/acre, estimates could reach almost 40,000 prairie dogs on county open space. It must be noted, though, that this extrapolation is not based on a validated mathematical model. This would require some determination of exact numbers in the colonies monitored to calculate a factor of correction. Using the value of 60% being observable above ground is based mostly on communications with other biologists who work with prairie dogs in urban situations and partially on values found in the scientific literature.

Even with numbers of prairie dogs and occupied acreage at the high levels mentioned above, management efforts in 2001 have still been focused on relocation of colonies from NPD sites to HCA receiving sites. The wildlife management staff has continued relocation efforts through 2001 under the guidance and direction of POSAC and BOCC. The current management plan does, however, allow for the use of other management activities as approved in 1999. In 2002, staff will request that some of these alternate management activities be implemented to address the high populations of prairie dogs on some POS properties. The request will point to the inability of staff to successfully trap and relocate all problem colonies, and to the population levels on the HCA sites. The concerns of neighboring property owners voiced over the past few years will also be noted in making this request.

One activity that was not specifically described in the current management plan is the trapping of prairie dogs for contribution to programs involved in the recovery and rehabilitation of native prairie dog predators. This could include raptor rehabilitation centers in Colorado and the black-footed ferret recovery program, which has a release site in Moffat County. During times of peak prairie dog populations in Boulder County, when numbers may exceed the carrying capacity of the designated HCA sites and NPD sites still are occupied, it is felt that this is a feasible and ecologically realistic management activity. Even though this management activity was proposed in 2001, staff was directed not to implement such activity during this past year.

Management Activities in 2001:

In 2001, a total of 578 prairie dogs were trapped and relocated from 8 separate sites (Table 3). The prairie dog crew began trapping and relocation efforts in mid-June and continued for 5 months into mid-November. BCPOS staff trapped and relocated 498 prairie dogs from 7 of the removal sites. Additionally, Wildlife Property Management, LLC, trapped 80 prairie dogs on the Hillside Estates property in early October under a contract with BCPOS. All of these prairie dogs were relocated to the Southeast Buffer HCA. Six individual release areas were designated on this HCA. All were artificially constructed due to the lack of vacant natural burrows on any HCA site. Two were constructed on the Lindsay parcel, in the Rock Creek drainage area. The remaining 4 sites were constructed on the upper mesa of the Mayhoffer parcel. Two were in the southwestern region of the parcel, north of the Coalton Trail colony and west of the Mayhoffer

North colony. The other two were constructed on the northern end of the parcel, before the drop-off into the Coal Creek drainage area.

A total of 242 artificial burrows were constructed. Wooden box chambers accessed via 4" drain tile tubing were place in each burrow. Prairie dogs were released into 184 of these burrows. Many of the remaining 71 artificial burrows were occupied by some of these initially released prairie dogs before subsequent releases could occur in them. The artificial burrows had hardware cloth caps placed over the entrances after the releases for an average of 3 days before being removed. These caps were installed to prevent immediate dispersal and reduce initial predator mortality.

As described in the 1999 prairie dog management plan, all colony sites on county open space were mapped using Global Positioning System and Geographic Information System technology. Data collection and mapping protocol has been coordinated and standardized with City of Boulder Open Space and Mountain Parks Department methods. This protocol determines guidelines for differentiating between separate colonies and distances from outer burrows to include in mapping. Such standardization of measurements will result in more accurate measurements of colony abundance, size and growth within Boulder County over the years. It also is necessary for data collection on jointly owned properties that are alternately mapped by either agency from year to year. Mapping was conducted in late September into October, when colony expansion has occurred for the year. The results of data collection in 2001 indicate over 2400 acres of active colonies on BCPOS properties (Figure 1a,b)(Table 1).

Greater focus on post-release success of relocation efforts was made in 2001. Meaney and Associates monitored relocated prairie dogs under contract with BCPOS. Initial surveys were done in 2000 of some release sites and a control site with no removal or relocation activity. Monitoring was continued in 2001 at the control site and the 2000 release sites and also at the release sites of 2001. The control site and the previous release sites were monitored in March prior to relocation efforts. The results showed existing population characteristics when the colony sizes should be lowest following winter mortality and prior to spring breeding. These sites were then monitored again in June prior to relocation efforts, when juveniles appear above ground. Populations are at their highest at that time. Most of the colonies appeared to have remained stable or declined slightly since initial counts were done in the summer of 2000. The translocated colonies that exhibited noticeable increases in this time (Coalton Trail, Mayhoffer Dead Cow, Rabbit Mountain) all had existing burrows which prairie dogs were released into. The Mayhoffer North site consisted of artificial burrow sites and had a significant decline in that same time period (Table 4).

All relocated prairie dogs in 2001 were dye-marked prior to release to facilitate accurate assessments of retention and dispersal. This enabled the observers to differentiate released prairie dogs from established local populations at release sites. It also made it possible for observers to spot released prairie dogs that dispersed to adjacent colonies in many instances. A minimum of 9% (54 of 578) of the released prairie dogs successfully dispersed to other colonies within 1.4 km of their release sites, based on re-sightings of marked prairie dogs at these colonies (Table 5). When these re-sighted prairie dogs off-site were combined with re-sighted prairie dogs that remained on the release sites, known survival rates 60 days post-release varied from 8% to 61% (Table 5). Still, overall retention rates on release sites were considered low (approx. 5-20% 30 days post-release)(Table 3).

BCPOS staff began investigating some of the potential factors causing poor site retention of relocated prairie dogs. One factor examined was the design of the release box. The single-entry design used at most sites was designed by the wildlife biologists working for the Turner Foundation and used on their reintroduction sites in New Mexico. The BCPOS crew experimented with using a double-entry box on two release sites. A casual examination of this limited data does indicate the possibility that site retention may be higher when double entrance boxes are used. One site had at least 25% retention after the first 30 days. Since this was a limited investigation, it would be premature to assume that double-entry boxes conclusively result in better rates of retention. Field personnel also began investigating the possible effect on retention of differences in temperatures between natural and artificial burrows. Some data was collected, but a problem in methodology has resulted in the need to repeat this investigation with improved data collection methods and the inability to utilize this current data.

Prairie dog containment has been and continues to be a challenge for BCPOS. Barrier maintenance and installation projects were conducted on numerous properties in an attempt to prevent migration onto adjacent parcels of land from HCA or MOA sites. Major replacement and repair work was done on the plastic barrier surrounding the north HCA site on CHP at RCF. New barrier materials were installed on the boundary fence with neighboring property owners of the James Construction property at Spine and Jay Roads. This included replacement of one existing fence segment and modification of another along the southeast boundary prior to installing the barrier material along them. This project was cost-shared with the neighboring property owners and represents an example of good neighbor policy that benefits both entities. Another barrier project was done on the south and west sides of the Colp property, at Highway 36 and Nelson Road. In this situation, chicken wire was placed along the existing fence line instead of the solid plastic barrier material used in other situations. The rocky soils found on this site precluded the installation of visual barrier material, which needs to be partially entrenched in order to be effective. Chicken wire could be attached to the fence and then stapled to the ground with landscape spikes, which could be adjusted to fit the local soil condition. Chicken wire was also place along the perimeter of the Superior cemetery after removal of the prairie dogs there. All of these projects used a combination of volunteer help and county sheriff department work crew assistance.

Preble's Meadow Jumping Mouse

Management Activities in 2001:

Only one property was surveyed for Preble's meadow jumping mouse in 2001. The Lower Boulder Creek Restoration Project is set to continue east of Highway 287. A survey needed to be conducted on this reach of the river prior to project implementation. A clearance survey following US Fish and Wildlife Service guidelines was conducted along the creek on the A. Dawson property from July 16th through July 20th. The survey consisted of 800 trap-nights (200 traps set for 4 nights) conducted along 4 separate transects. Each transect was 125 m. long, with

traps spaced 5 m. apart and consisting of a trap-line in the stream corridor and another parallel to it and 10 m. apart in upland habitat. All traps were baited in late afternoon or early evening and checked the next morning, beginning around sunrise to prevent heat-related mortality or stress to the trapped animals.

No Preble's meadow jumping mice were trapped during this survey. The adjacent reach of the creek east of the 111th Street/Kenosha Road overpass to County Line Road had been surveyed in 1999 without any Prebles captures either. This information has been forwarded to the U.S. Fish and Wildlife Service. A copy of this survey should be re-submitted to the Service with any application for clearance on this project by BCPOS. Surveys are only valid for 1 year to qualify a proposed project site for clearance.

Bats

Management Activities in 2001:

BCPOS again participated in the annual inter-agency bat activity monitoring survey that has been coordinated by the Colorado Bat Society since 1996. This activity trains volunteers to monitor relative bat activity over bodies of water in the county. Data included observing the number of bats passing over a water body in a given time interval, and quantifying the percentage of time that bats were echo-locating, using an ultrasonic sound detector. The data is used as an index to determine what sites in the county have effective bat habitat and which are lacking.

Ten sites were monitored on 7 BCPOS properties this past year (Figures 2a, 2b). They were located on Hall Ranch (St. Vrain River), Fairgrounds Lake, Walden Ponds (4 sites), Little Gaynor Lake, Marfell Lakes, Stearns Lake and Warembourg. The seasonal wildlife technician was responsible for coordinating volunteer recruitment cooperatively with personnel from City of Boulder Open Space and Mountain Parks and Eldorado Canyon State Park. The wildlife specialist and the seasonal wildlife technician both assisted in the training of volunteers. Training was done in May at NIST for classroom instruction and at Walden Ponds for field practice.

Site visits were conducted for 2 consecutive nights, if possible, per month in June, July and August. Teams of 2 volunteers were responsible for each site. All data were entered and copied to the project coordinator at COSMP. Information in this data will be used to select sites for future focused research and investigation. This would include netting and identifying bats and possibly doing some work with radio-telemetry to determine roost sites. Cumulative data for all sites surveyed since 1997 are in Figures 2c and 2d.

BIRDS

Waterfowl Management

Canada Geese:

Canada goose management on BCPOS is currently limited to deterrence activities, such as hazing with pyrotechnic devices and spraying vegetation with methyl anthranilate as a taste deterrent to grazing. Sporadic actions are taken throughout the year as necessary to keep geese from negatively impacting certain areas. Some hazing has been done at Walden Ponds and the Fairground Pond areas to deter geese from grazing on newly emergent grasses at revegetation sites. However, due to the scope of this problem, and the growing goose population in Boulder County and the rest of the Front Range, other management activities have been proposed.

The issue of limited goose hunting on agricultural properties in eastern Boulder County has been re-addressed this year. Concerns from agricultural tenants regarding goose grazing on emergent winter wheat and other crops is an ongoing issue. All tenants have the ability to haze geese off of leased properties with cracker shells and other pyrotechnics. Many are asking for permission to lease out hunting blinds as well in order to supplement income. Historically, the eastern county agricultural properties had been used for this purpose until purchased by Boulder County. Current BCPOS regulations prohibit hunting on these properties. In the past 10 years, the Colorado Division of Wildlife has calculated over a 5,000% increase in resident Canada goose populations along the Front Range communities, including eastern Boulder County. Hazing and grazing aversion are quite ineffective under these conditions and are, at the best, minor short-term diversions of the problem. This issue of goose hunting on agricultural BCPOS properties as a wildlife management tool for the department will continue to be discussed.

Other forms of goose management include egg addling to prevent reproductive output in problem areas. In the past, this required individual applicants to annually file an individual application for each property with the U.S. Fish and Wildlife Service, Migratory Bird Division. (BCPOS has not formally done this in the past due to issues of public perception.) In 2001, the CDOW successfully petitioned the Service to grant a statewide depredation permit for Canada goose management, to be administered by the Division. This would allow BCPOS to apply directly to CDOW for a general permit to conduct this type of activity. The application would then be processed in a timely manner and allow BCPOS to manage any and all of its properties under one permit. At this time, CDOW is still setting up the program, which should be available for application in 2002.

Other Waterfowl Management Activities:

The staff wildlife specialist has continued to assist the CDOW in monitoring waterfowl populations on BCPOS properties during 2001. Winter waterfowl counts were conducted on Walden Ponds on January 9th. This survey focuses on Canada goose winter populations. A resident waterfowl survey on June 20th focused on nesting Canada geese and any other nesting waterfowl species found. This survey included Walden Ponds, Fairground Lake and Cattail Pond, Stearns Lake, Lagerman Reservoir and Little Gaynor Lake. All data was copied to CDOW for their statewide database.

The breeding waterfowl monitoring project conducted by volunteers was revived in 2001. Six volunteers responded and covered Walden Ponds, Sombrero Marsh and Stearns Lake. Surveys were conducted weekly, if possible, from April through October. The resulting data has not yet

been entered into the database. There will be a request of the volunteers in 2002 to do some of the data entry, if possible, due to the extensive backlog of data from previous years.

Raptors

Burrowing Owl Management Activities:

As described in the prairie dog management element of the grassland management plan, all scheduled prairie dog removal sites were surveyed for nesting burrowing owls prior to implementing any removal. Burrowing owl activity was observed on the Hillside Estates property in early May. To assure that any nesting activity was not disturbed, planned trapping and removal was delayed until late in the season. Continued surveillance of the site, however, indicated that the pair observed did not stay on the site when the non-native Russian rye and other grasses grew too tall for the owls to tolerate. No activity was observed after mid-July.

Burrowing owls again nested on CHP at RCF in 2001. None returned to the nest site on Agricultural Field 27, south of the railroad tracks, in 2001. Up to two pairs had successfully nested there in 1999 and 2000. In 2001, two pairs were observed occupying burrows on Agricultural Field 4, the 40 acre designated preserve site on the north end of the property. This site had nesting owls on it in the 1980's and had been designated as a preserve for that reason. In June, Birds of Prey Foundation personnel, with POS staff, released six additional burrowing owls into open burrows on that preserve. Subsequently, most left the site, and by July only one pair was observed to remain on the site. This pair did not appear to fledge any owlets. In summary, burrowing owls returned to CHP at RCF but did not successfully reproduce. It is not known if the introduction of the released owls interfered with nesting efforts of the existing pairs. To be cautious, any future releases of rehabilitated or captive-bred burrowing owls will be done at other sites if any burrowing owls are observed to occupy the site already.

There had been a report of burrowing owls observed on the east side of Rabbit Mountain in June. Subsequent site visits by the wildlife specialist did not find any indication of occupancy by burrowing owls in mid-June or early July.

Golden Eagle Nest Monitoring:

Six volunteers conducted nest monitoring on the historic Rabbit Mountain hogback site during the closure season in 2001. That nest successfully fledged 2 eaglets. The historic Heil Ranch site in Marietta Canyon was investigated 3 times during 2001. It also was successful, having fledged 2 eaglets as well.

The resident caretaker and seasonal assistant discovered another active Golden Eagle nest site on Heil Ranch in 2001. That site was located at the north end of the property, in an unnamed box canyon east of the Lyons Heights subdivision. Two eaglets were observed here with a pair of adults in August. This discovery was not made until late in the season, so nesting activity was not actually monitored. The nest is fairly proximate to private residences and only about 0.25 miles from Red Hill Gulch road going through Heil Ranch. The area west of the road will be posted as a seasonal closure in 2002. The existence of this nest at this site will have to be

considered when planning any future trail construction and/or recreational access into this part of Heil Ranch.

Goshawk Surveys

Goshawk surveys were completed this season on the Heil Valley Ranch property on May 15 and June 7. Standard call-back protocols were followed, broadcasting recorded Goshawk calls in known historic Goshawk nesting areas and old growth habitats. The only detection from the surveys was a confirmed male Goshawk at the old quarry off of the westward road in the center of the property. A female Goshawk was possibly seen in the same area at that time. Additional reports from Kevin Grady, Heil caretaker, as well as the seasonal wildlife technician indicate a female Goshawk near birding station B10, near the Red Hill Saddle, and in the area where the new trail loops and crosses the road on the North end. This visual observation was made in mid-July, approximately one month after the calling surveys.

No Goshawk surveys were conducted on any other BCPOS property in 2001. Surveys will be conducted in 2002 on Caribou Ranch as well as Heil Ranch. It is recommended that surveys be conducted earlier during the nesting period, and that nest trees are positively identified to assure that disturbance is reduced.

Other Avian Monitoring

North Foothills Open Space Avian Monitoring Project:

The avian monitoring project on Hall Ranch, Heil Valley Ranch, and Rabbit Mountain, has been in effect since 1999. Monitoring of the avian ecological conditions of these properties over time will help develop effective management programs for maintaining or restoring the ecological integrity of these habitats. On Heil Valley Ranch in particular, the ongoing forest thinning and burning and trail construction offers a unique opportunity to better understand the effects these management practices have on the breeding bird community. These issues are also being studied on Heil Ranch by graduate students of Dr. Alexander Cruz of the Department of Environmental, Population, and Organismic Biology at the University of Colorado.

A total of 85 point count locations were established in 1999 on the North Foothills properties, divided between the relative availability of habitat types (Hall Ranch = 35, Heil Valley Ranch = 20, Rabbit Mountain = 29; see maps). The general habitat types were measured in a 50 m. radius from each point and included: Ponderosa Pine (*Pinus ponderosa*) forest (PIPO), n =19; Ponderosa Pine / Douglas Fir (*Pseudotsuga menziesii*) forest (PIPO/PSME), n = 1, Ponderosa Pine mixed with riparian woodlands (PIPO/RIPE), n = 3; Ponderosa Pine / Savana (PIPO/SAVA), n = 6; Mountain Mahogany (*Cercocarpus montanus*) (CEMO), n = 20; grasslands (GRAS), n = 22; Mountain Juniper (*Juniperus scopulorum*)(JUSC), n = 2; and Ponderosa Pine / Juniper (PIPO/JUSC) n = 2. All transects are of a size that allows them to be completed in 2 days of surveying. Transects are located both on and off trails to determine how passive recreation may be affecting breeding birds.

From June 1 through July 15, 7 volunteers and one staff member worked over 170.75 hours, completing point counts at all of the chosen locations. Each point was marked with a labeled carsonite post so that volunteers could easily locate them. Counts were conducted for 5 minutes

at each point and were performed 3 times per season at each location. During each count, all birds seen or heard within 50 m. were identified and recorded. All counts took place between 05:30 and 10:00, with most counts being completed by 09:00. A Relative Abundance Index (RAI) was determined for each point and each property and habitat type using the following formula:

> Total Number of Observations of Birds / Total Number of Census Days (* Points-for property RAI's).

Only birds seen or heard within 50 m. of the point were tallied in the RAI (Table 6, Table 7a-c).

The species richness on every property declined to some degree between 2000 and 2001 (Hall Ranch 36-23; Heil Valley Ranch 36-34; Rabbit Mountain 35-28)(Table 7). The highest species richness values per point on each property include: point T4 on Hall Ranch, by the old stock pond, between the Nighthawk Trail and the Bitterbrush Trail (Mountain Mahogany habitat type); point B10 on Heil Valley Ranch, west of the Red Hill saddle (open Ponderosa Pine / Savanna forest); point T7 on Rabbit Mountain, south mid section of the Eagle Wind Loop Trail (grassland habitat).

Continued updating and review of the data is needed, including bringing in the 1999 Hall Ranch data, which was the only property surveyed that year. Additionally, BCPOS staff will continue to collaborate with CU researchers conducting their ongoing study of breeding bird response to recreation and forestry management practices on Heil Ranch.

RESEARCH PROJECTS

Small Grant Program:

A total of 3 small grants in 2001 were awarded to research projects addressing wildlife issues. The research topics included breeding passerine bird community dynamics in ponderosa pine habitat, post-release retention and dispersal of relocated black-tailed prairie dogs and an investigation into immuno-contraceptive control of local black-tailed prairie dogs in Boulder County. The recipient of the latter project had to withdraw before implementation due to lack of sufficient matching funds. The awarded funding for that project was later distributed amongst other recipients of awards who could justify the extra funds to enhance their projects.

One award went to Dr. Alexander Cruz, CU Boulder, to continue an ongoing investigation of passerine bird responses to forest management and trail impacts in foothills habitat on Heil Ranch. This was the third year of partial funding for the study by BCPOS. Data collected to date, including 2001, is being used as baseline data prior to impacts of recreational trails and prescribed forest thinning. The data includes all observed breeding birds in the study area, locations and outcomes of all active nests found, and environmental conditions surrounding those nests.

The other award went to Dr. Carron Meaney and Associates to continue the post-release analysis of relocated prairie dog retention and survival. Work done in 2001 indicated that retention rates

at artificial release sites were quite low. Some of the reasons proposed included soil conditions hindering new burrow digging and proximity to the nearest adjacent towns. A significant number of the marked and released prairie dogs were observed at nearby towns within 30 days of release. Further description of her observations and measurements is found in the previous description of prairie dog management activities.

Other Research Activities:

The long-term mountain bluebird nest box project has continued on Walker Ranch under Dr. Hector Galbraith. Dr. Galbraith took over this volunteer effort from the Boulder Chapter of the Audubon Society in 2000. Dr. Galbraith added an additional 6 nest boxes to the existing transects. Most were on the Meyers Gulch part of Walker Ranch. One existing transect of 4 boxes is on the south side of Flagstaff Road, near the homestead site. No new boxes were added there.

A total of 8 boxes were replaced in 2001. Only 2 of these were boxes damaged or destroyed by the Walker Ranch fire in 2000. The others were destroyed by black bears foraging prior to hibernation.

Dr. Galbraith will continue to monitor this study and report on the nest success annually. He is investigating any habitat parameters that might be affecting the nesting success of mountain bluebirds at this location.

Erin Powell, a Ph.D. student of Dr. Michael Antolin at Colorado State University, has begun a study of black-tailed prairie dog physiological ecology on Heil Ranch and Rabbit Mountain. In September, prairie dogs were trapped on the highest recorded colony on POS property, near the Heil Ranch caretaker house (6100 ft.). More prairie dogs were trapped in January on Rabbit Mountain. Data logging transponders were surgically implanted in these subjects, which were then returned to their burrows. They will be re-trapped in spring/summer of 2002 and the transponders will be removed. The data collected will include daily physiological measurements of core body temperature and respiration since implanted. This study is intended to determine if there is any correlation with available diet, as measured by the surrounding vegetation, and metabolic responses. This study is intended to continue into 2003.

FIGURE 1a- PRAIRIE DOG COLONY DISTRIBUTION (North County)

FIGURE 1b- PRAIRIE DOG COLONY DISTRIBUTION (South County)

Table 1- Status of Active Prairie Dog Colony Acreage on BCPOS Lands

Management Category	1999 Management Plan Designated Acreage	Current ArcView Database Acreage	1998 Active Colony Acreage	2001 Active Colony Acreage
HCA	4600	6662	150	1166
MOA	2100	2597	500	591
NPD	11100	11592	150	198
TBD		3278		492
Totals	17800	24129	800	2447

Table 2- Prairie Dog Population Estimates for BCPOS Lands in 2001[1]

	March[2]				June[3]		
	Low	High	Avg.		Low	High	Avg.
Density	4.5/acre	9.8/acre	7.2/acre		6.0/acre	16.0/acre	9.8/acre
	5247	11465	8357	HCA	6997	18657	11465
	2660	5812	4235	MOA	3547	9457	5812
	892	1947	1418	NPD	1188	3168	1947
	2213	4838	3527	TBD	2952	7872	4838
Totals	11012	24062	17587		14682	39152	24062

[1] Based on surveys by Meaney and Associates (Monitoring of Prairie Dogs on Boulder County Open Space. 2001). Values from that survey taken as 60% of true population levels and extrapolated.
[2] March surveys conducted on Platt/Centennial (control), Rabbit Mountain and Mayhoffer sites.
[3] June surveys conducted on Platt/Centennial (control) and Rabbit Mountain sites.

Table 3- Summary of Prairie Dog Relocation Efforts in 2001

Property Name	# Relocated	Release Site	# Artificial Burrows	30 Day Post-Release Count
Colp	193	Lindsay	96	28
Hirschfeld	103	Mayhoffer	35	5
James Constr.	103	Mayhoffer	29	5
Hillside Estates	80	Mayhoffer	35	12
Keyes	46	Mayhoffer	23	
Superior Cem.	26	Mayhoffer	10	
Lastoka	14	Mayhoffer	8	
Colp	13	Mayhoffer	6	25[4]

[4] Post-release count for Keyes, Superior Cemetery, Lastoka and Colp relocated prairie dogs; all released to same site

Table 4. Count numbers and densities per acre of prairie dogs at baseline and translocation sites in 2000 and 2001

SITE (Size in acres)	# of Animals Released in 2000	2000 Counts; density (month)	2001 Counts; density March	2001 Counts; density (month)	
Platte Centennial – South[1] (12.97)	Natural Colony	124; 9.6 (June)	76; 5.8	95; 7.3 (June)	
Platte Centennial –West[1] (11.44)	Natural Colony	84; 7.3 (June)	31; 2.7	70; 6.1 (June)	
Platte Centennial – Central[1] (26.71)	Natural Colony	99; 3.7 (June)	89; 3.3	96; 3.6 (June)	
Mayhoffer Dead Cow[2] (28.09)	Translocated Colony 87	98; 3.5 (Sept.-Oct.)	107; 3.8	NA	
Rabbit Mountain (13.17)	Translocated Colony 233	54; 4.1 (October)	62; 4.7	89; 6.5 (June)	
Coalton Trail (6.10)	Translocated Colony 127	17; 2.8 (July)	36; 5.9	NA	
Mayhoffer North (8.31)	Translocated Colony 217.	18; 2.2 (November)	3; 0.4	6; 0.7 (July)	12; 1.4 (Sep)

[1] These are all sampling units that are part of the same larger colony.
[2] This site consisted of a small number of translocated animals released adjacent to a large, well- established natural colony. The counts are of the natural colony and the translocated colony combined.

Table 5- Post-Release Results of Prairie Dog Translocations in 2001

Site	Number Released	2 Month Count	# Animals that Moved	Retention after 2 months (%)	Percent Alive at 2 Months[5]
Mesa West	103	3	N/a	3%	N/a
Mesa East	103	0	N/a	0	N/a
Lindsey West	96	5	8	5%	13.5%
Lindsey East	97	1	7	1%	8.2%
Mesa Northwest	99	25	35	25%	61% (1 month)
Mesa Northeast	80	14	4	5%	23% (1 month)

[5] Includes marked animals observed outside of release site

FIGURE 2

BAT ACTIVITY SURVEY RESULTS ON BCPOS PROPERTIES

(1997 – 2001)

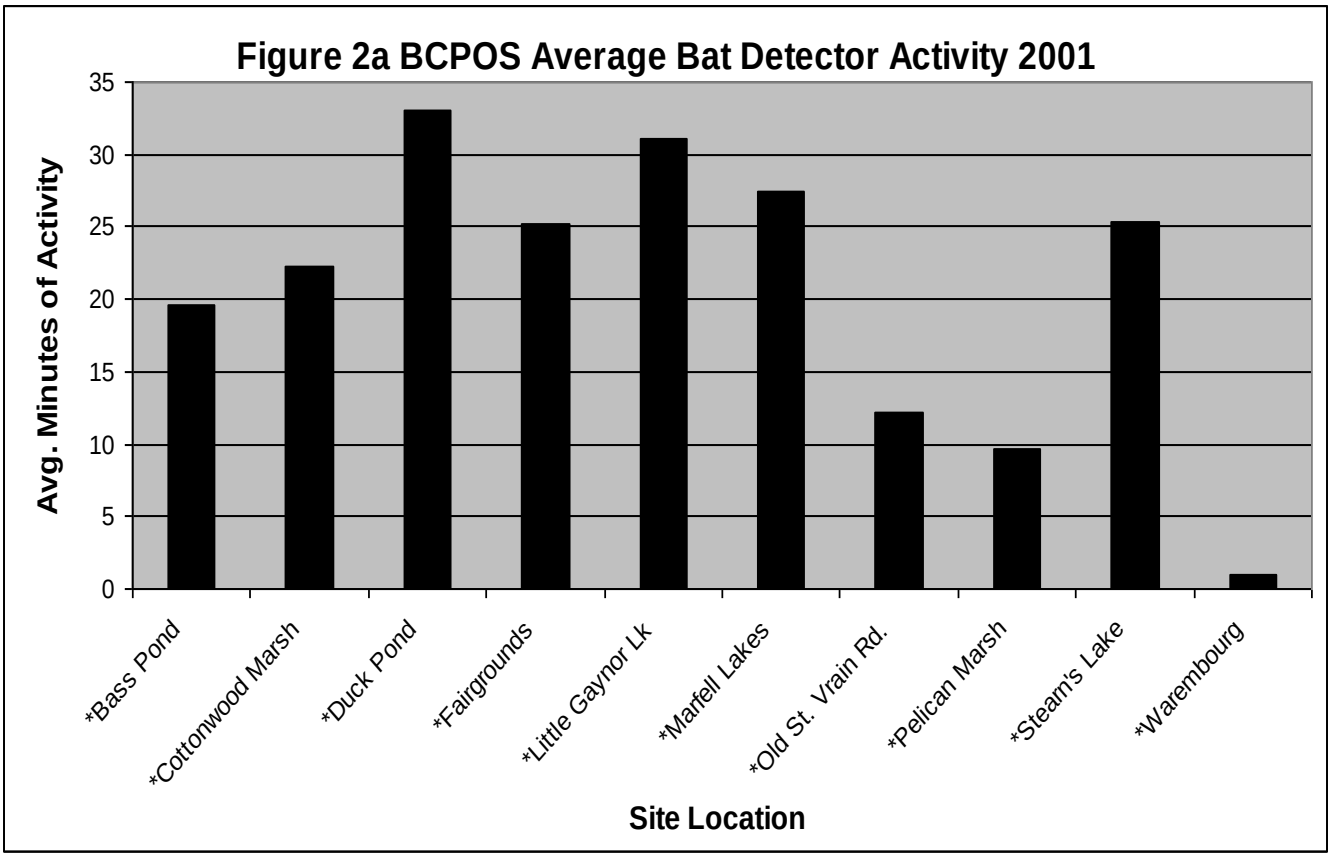


Figure 2a BCPOS Average Bat Detector Activity 2001
Avg. Minutes of Activity
35
30
25
20
15
10
5
0
*Bass Pond
*Cottonwood Marsh
*Duck Pond
*Fairgrounds
*Little Gaynor Lk
*Marfell Lakes
*Old St. Vrain Rd.
*Pelican Marsh
*Stearn's Lake
*Warembourg
Site Location

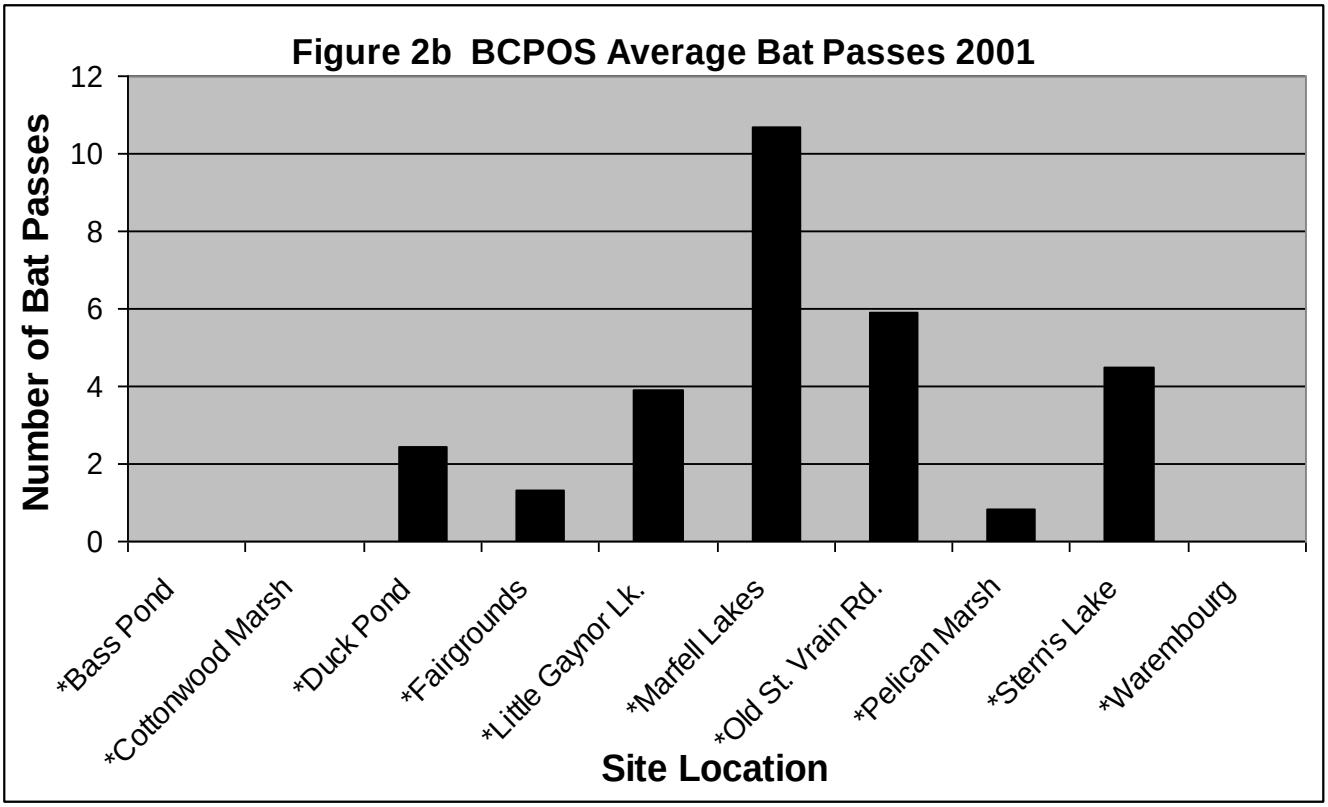
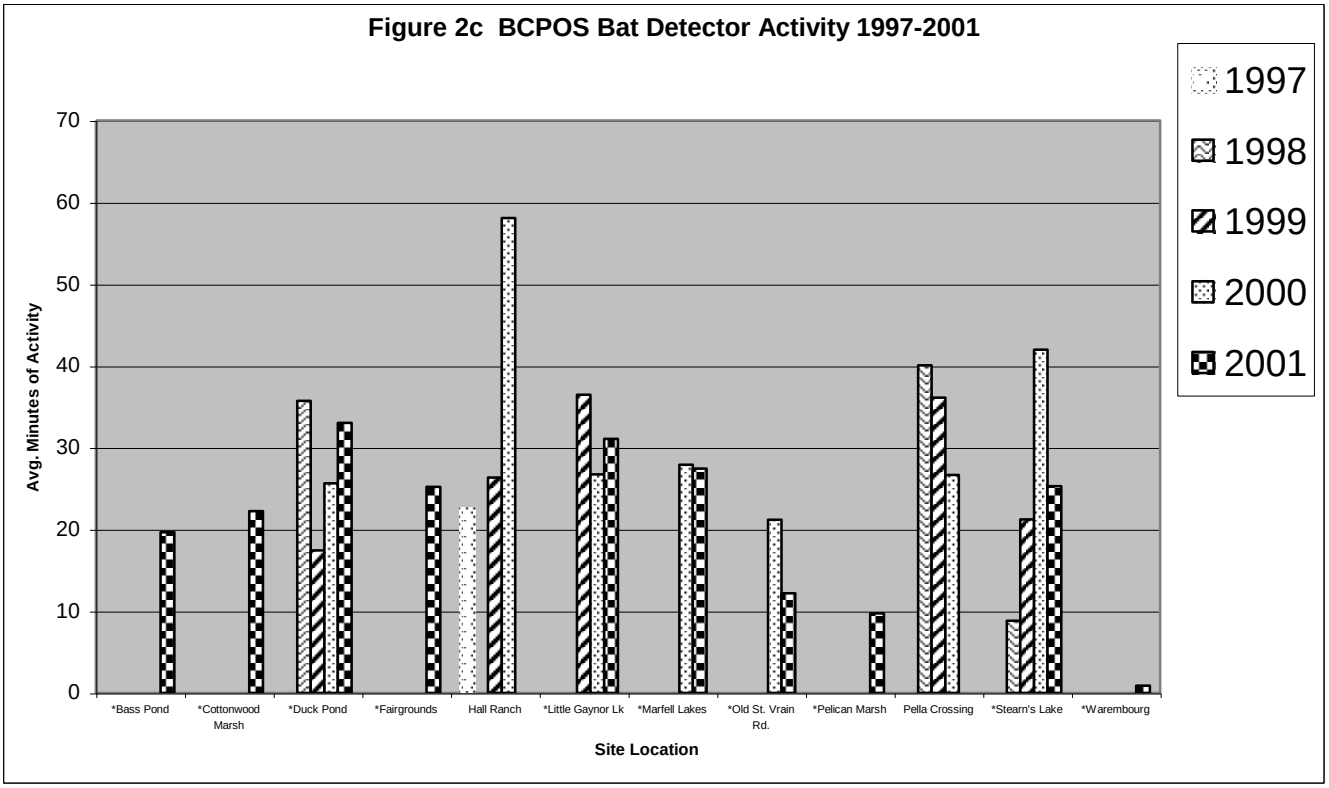


Figure 2b BCPOS Average Bat Passes 2001
Number of Bat Passes
12
10
8
6
4
2
0
*Bass Pond
*Cottonwood Marsh
*Duck Pond
*Fairgrounds
*Little Gaynor Lk.
*Marfell Lakes
*Old St. Vrain Rd.
*Pelican Marsh
*Stern's Lake
*Warembourg
Site Location



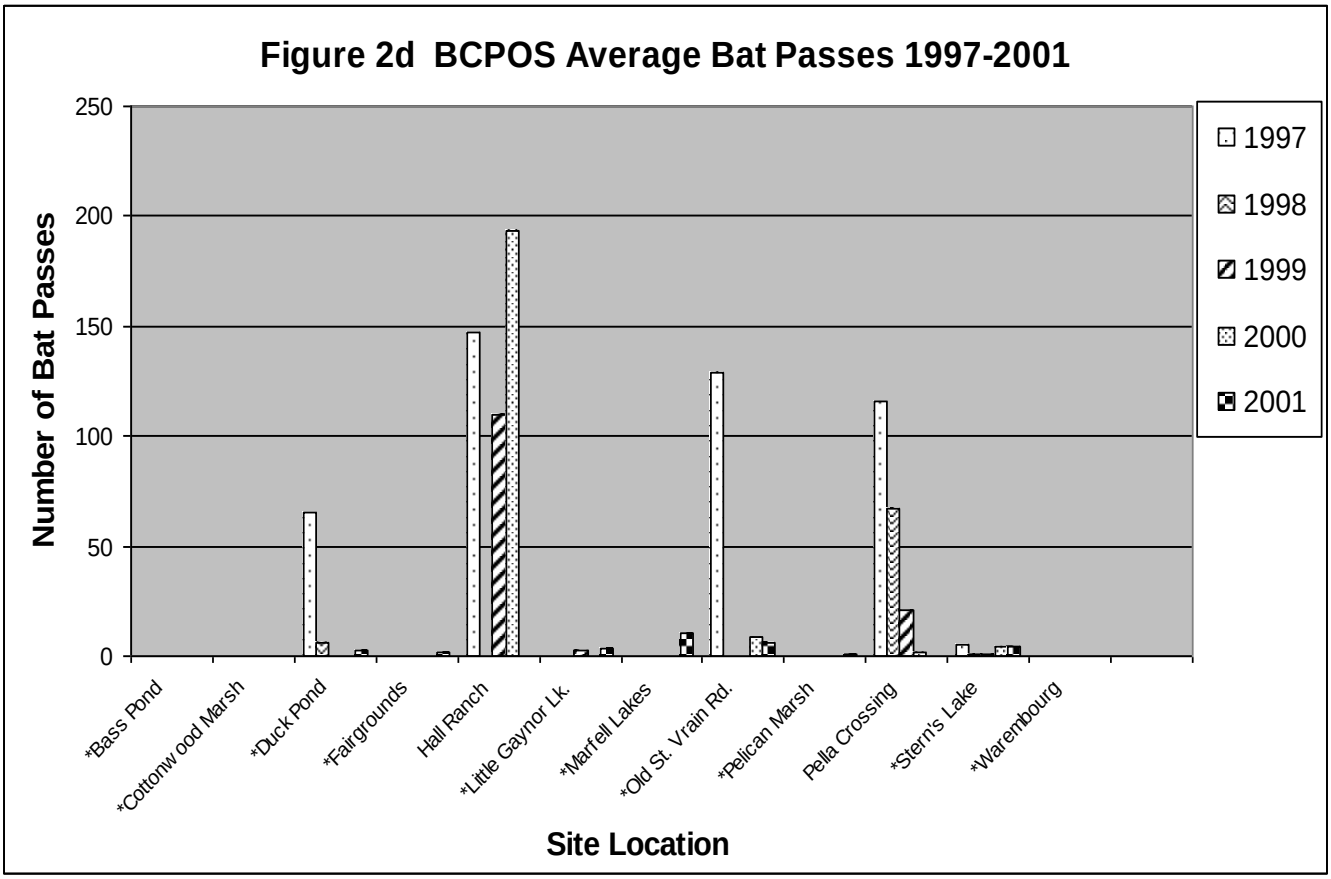


Table 6(1): Relative Abundance Index for North Foothills Open Space

Insert

Table 6(1): Relative Abundance Index for North Foothills Open Space

Insert

Table 6(2): Relative Abundance Index for North Foothills Open Space

Table 7a: Relative Abundance Index* of bird species on Rabbit Mountain 2001

Species	CEMO (N=14)	GRAS (N=10)	JUSC (N=1)	PIPO (N=5)
Species Richness =	*24*	*22*	*9*	*19*
Mallard				
Red-tailed Hawk	#	#	#	#
Killdeer				
American Kestrel	#	#		0.20 ± 0.30
Prairie Falcon		#		
Mourning Dove	0.24 ± 0.29	0.18 ± 0.23	1.00 ± 0.00	0.26 ± 0.50
Common Nighthawk		0.12 ± 0.21		
White-throated Swift				#
Broad-tailed Hummingbird		#		0.78 ± 0.53
Northern Flicker				0.69 ± 0.5
Lewis' Woodpecker				
Eastern Kingbird				0.10 ± 0.22
Western Wood-Pewee	#			0.53 ± 0.87
Violet-green Swallow				
N. Rough-winged Swallow				
Cliff Swallow	0.43 ± 1.32	0.20 ± 0.31		1.50 ± 3.35
Scrub Jay				
Steller's Jay				
Black-billed Magpie	0.18 ± 0.41	0.11 ± 0.25		0.55 ± 0.80
Canyon Wren	#	#		
Rock Wren	0.10 ± 0.17	#		
Black-capped Chickadee	#			
Red-breasted Nuthatch				
Pygmy Nuthatch		0.27 ± 0.84		
Brown Creeper	#	#		
Blue-gray Gnatcatcher	0.33 ± 0.54		3.0 ± 0.00	0.27 ± 0.28
Mountain Bluebird		0.13 ± 0.42		
American Robin	#		0.33 ± 0.00	
Cedar Waxwing	#			
Plumbeous Vireo				#
European Starling	#			
Virginia's Warbler	#			#
Yellow-rumped Warbler	#			
Chipping Sparrow				#
Yellow-breasted Chat	#	#	0.33 + 0.00	
Vesper Sparrow	#	#		
Lark Sparrow	0.27 + 0.45			0.20 + 0.45
Black-headed Grosbeak				#
Grasshopper Sparrow		#		
Blue Grosbeak		#		
Western Meadowlark	0.43 + 0.52	0.78 + 0.53		0.37 + 0.65
Lazuli Bunting	#		0.67 + 0.00	0.20 + 0.30
Brown-headed Cowbird	0.52 + 0.69	#	0.33 + 0.00	0.40 + 0.60
Bullock's Oriole	0.11 + 0.34	#		0.10 + 0.22
Spotted Towhee	1.45 + 0.77	0.69 + 0.5	1.67 + 0.00	1.10 + 0.64
Lark Sparrow				
Lesser Goldfinch		0.18 + 0.23		
American Goldfinch	0.12 + 0.31	0.28 + 0.31	0.33 + 0.0	0.20 + 0.30

*RAI = mean number of detections per habitat type. # = RAI values below 0.1

Table 7b: Relative Abundance Index* of bird species on Heil Valley Ranch 2001

Species	PIPO	PIPO/PSME	PIPO/RIPE	PIPO/SAVA
	N=10	N=1	N=3	N=6
Species Richness =	*19*	*4*	*14*	*25*
Cooper's Hawk				#
Mourning Dove	0.23 +/- 0.23	0.33 +/- .56	0.22 +/- 0.19	#
Common Nighthawk	0.13 +/- 0.23			0.28 +/- 0.14
Broad-tailed Hummingbird			0.56 +/- 0.19	0.11 +/- 0.27
Northern Flicker	#			
Western Wood-Pewee	0.20 +/- 0.32		0.22 +/- 0.19	0.11 +/- 0.17
Cordillieran Flycatcher		0.50 +/- 0.71	0.45 +/- 0.39	
Hammond's Flycatcher	#		0.11 +/- 0.19	#
Dusky Flycatcher			0.11 +/- 0.19	
Cliff Swallow			0.33 +/- 0.58	
Steller's Jay	0.23 +/- 0.23			0.34 +/- 0.37
Black-billed Magpie				#
Canyon Wren			0.11 +/- 0.19	
Rock Wren			0.11 +/- 0.19	0.11 +/- 0.27
Mountain Chikadee	#			
Black-capped Chickadee	0.27 +/- 0.26	1.0 +/- 0.41		#
Red-breasted Nuthatch				0.28 +/- 0.44
White-breasted Nuthatch	0.10 +/- 0.16			
Pygmy Nuthatch	0.53 +/- 0.74			0.17 +/- 0.28
Brown Creeper	#	0.50 +/- 0.71		
American Robin	0.37 +/- 0.33		0.11 +/- 0.19	0.33 +/- 0.30
Townsend's Solitaire	0.10 +/- 0.16			
Plumbeous Vireo	#			
Yellow-rumped Warbler			0.22 +/- 0.39	
Western Meadowlark				0.39 +/- 0.39
Western Tanager	0.10 +/- 0.23			0.28 +/- 0.25
Lazuli Bunting			0.22 +/- 0.39	0.11 +/- 0.17
Black-headed Grosbeak	#		0.11 +/- 0.19	#
Brown-headed Cowbird	#			0.11 +/- 0.17
Green-tailed Towhee				#
Spotted Towhee			0.44 +/- 0.19	0.11 +/- 0.17
Lark Sparrow				0.17 +/- 0.41
Chipping Sparrow				0.61 +/- 0.88
Gray-headed Junco	#			0.11 +/- 0.27
Lesser Goldfinch	0.13 +/- 0.32			0.44 +/- 0.58
American Goldfinch				#

*RAI = mean number of detections per habitat type. # = RAI values below 0.1

Table 7c: Relative Abundance Index* of bird species on Hall Ranch 2001

Species	CEMO (N=6)	GRAS (N=12)	JUSC (N=1)	PIPO (N=4)	PIPO/JUSC (N=2)
Species Richness =	20	28	6	13	13
Mallard	#				
Killdeer	#	#			
American Kestrel	#	#			
Mourning Dove	0.28 ± 0.53	0.15 ± 0.38		0.17 ± 0.33	
Common Nighthawk		0.33 ± 1.15		0.19 ± 0.24	
White-throated Swift		0.21 ± 0.38		0.15 ± 0.17	
Broad-tailed Hummingbird	0.10 ± 0.15	#			0.17 ± 0.24
Northern Flicker		#			0.17 ± 0.24
Lewis' Woodpecker	#	#			
Western Wood-Pewee		#			
Violet-green Swallow	#	#			
N. Rough-winged Swallow	0.33 ± 0.82	0.22 ± 0.54	0.33 ± .58		
Cliff Swallow	1.76 ± 1.67	1.42 ± 2.44		0.46 ± 0.32	1.50 ± 1.65
Scrub Jay			0.67 ± 1.15	#	
Steller's Jay				0.25 ± 0.50	0.17 ± 0.24
Black-billed Magpie	0.32 ± 0.67	0.89 ± 1.83		0.46 ± 0.36	0.17 ± 0.24
Canyon Wren	0.13 ± 0.21				
Rock Wren	0.22 ± 0.25	0.18 ± 0.29		0.42 ± 0.83	0.33 ± 0.47
Black-capped Chickadee	0.11 ± 0.27			#	1.00 ± 1.41
Red-breasted Nuthatch		0.86 ± 2.88			0.17 ± 0.24
Brown Creeper		#			
Blue-gray Gnatcatcher			0.67 ± 0.58	0.25 ± 0.50	0.17 ± 0.24
Mountain Bluebird		0.56 ± 1.48			
American Robin	0.11 ± 0.27	#		0.15 ± 0.17	0.33 ± 0.00
Virginia's Warbler	#				
Yellow-breasted Chat	0.17 ± 0.28	#	0.67 ± 0.58		
Grasshopper Sparrow		#			
Vesper Sparrow		0.28 ± 0.86			
Western Meadowlark		0.33 ± 0.48		0.31 ± 0.47	
Lazuli Bunting	0.36 ± 0.40	0.22 ± 0.48			0.17 ± 0.24
Brown-headed Cowbird		0.15 ± 0.40	0.67 ± 0.58		
Bullock's Oriole	0.11 ± 0.27	#			
Spotted Towhee	1.47 ± 1.02	0.94 ± 0.49	2.00 ± 1.00	0.75 ± 0.65	1.00 ± 0.0

Table 7c: Relative Abundance Index* of bird species on Hall Ranch 2001 (continued)

Species	CEMO (N=6)	GRAS (N=12)	JUSC (N=1)	PIPO (N=4)	PIPO/JUSC (N=2)
Species Richness =	*20*	*28*	*6*	*13*	*13*
Lark Sparrow		0.11 ± 0.18			0.17 ± 0.24
Lesser Goldfinch		#			
American Goldfinch	0.17 ± 0.29				

*RAI = mean number of detections per habitat type. # = RAI values below 0.1