



Department of Defense Legacy Resource Management Program

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Migratory linkages of Burrowing Owls on DoD installations and adjacent lands

Dr. Courtney J. Conway, USGS and University of Arizona
Carol A. Finley, Kirtland Air Force Base
Victoria Garcia, University of Arizona

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Introduction

Burrowing Owls (*Athene cunicularia*) were once a common breeder in grasslands and deserts throughout the western U.S. and Canada. However, some populations have declined and Burrowing Owls have been extirpated from areas on the western, northern, and eastern periphery of their breeding range. Habitat loss and fragmentation due to agricultural or urban development and declines in populations of colonial burrowing mammals are thought to have contributed to these declines. The reduction of prairie in the United States is linked to decreasing Burrowing Owl populations, and fragmentation of nesting habitat may result in a decreased likelihood that unpaired owls will find mates (Sheffield 1997). However, the control of burrowing mammals such as prairie dogs (*Cynomys spp.*) and ground squirrels (*Spermophilus spp.*) is thought to be the primary cause for the decline in Burrowing Owls (Desmond et al. 2000, Klute et al. 2003).

Due to concerns about persistence of remaining Burrowing Owl populations, Burrowing Owls are now federally endangered in Canada, and are listed as a Species of National Conservation Concern in the U.S. (US Fish and Wildlife Service 2002). Burrowing Owls are also state endangered in Minnesota and Iowa, and are being considered or have been petitioned for state listing in California and Washington. Populations are thought to have declined in other states as well: Arizona, Colorado, Kansas, Nebraska, Nevada, New Mexico, and Utah (Klute et al. 2003). Hence, Burrowing Owls are listed as a high priority species in state Partners-in-Flight conservation plans. For example, the Partners-In-Flight plan for Arizona ranks Burrowing Owls 19th in conservation priority out of 177 terrestrial bird species wintering in the state. Similarly, Burrowing Owls are listed as a high responsibility species in the New Mexico Partners-in-Flight plan.

Despite the declines in some portions of their range, burrowing owls appear to be increasing in other areas. One possible explanation for this paradox is that Burrowing Owls are becoming less migratory; owls which once migrated to northern breeding locations during the summer are becoming year-round residents in the southwestern U.S. and northern Mexico. In other words, breeding owl populations might be redistributing rather than declining. If this hypothesis is correct, it has implications for the validity of current or future Burrowing Owl listing petitions and implications for the effectiveness of different conservation and management efforts. Recent field studies on Davis-Monthan Air Force Base (DMAFB) in southern Arizona suggest that population densities on DMAFB are much higher compared to the surrounding landscape. Burrowing Owls have also been reported on many of the other DoD installations in the southwestern U.S. Hence, the DoD may play a key role in the maintenance or recovery of Burrowing Owl populations if declines continue. However, we currently lack information on the extent to which Burrowing Owl populations on DoD installations are self-contained and how much dispersal occurs among locations.

We will use stable isotopes of owl feathers, genetics from blood samples, and radio telemetry to quantify the importance of DoD lands to Burrowing Owl populations in the region, document the extent to which Burrowing Owls disperse between populations, identify where owls breeding on DoD installations spend the winter, and quantify land-use of migrating and wintering owls in the region. We are working with DoD installations in the western U.S. that have records of Burrowing Owls to test this hypothesis and to develop a coordinated, multi-agency program to help determine the extent to which Burrowing Owl populations are redistributing throughout North America.

Project Objectives:

- Locate Burrowing Owl nests on Department of Defense installations throughout the western U.S.
- Determine the migratory linkages and connectivity of Burrowing Owl populations on DoD installations and adjacent lands.
- Determine where Burrowing Owls nesting on DoD installations and adjacent lands spend the winter.
- Estimate the extent to which individual owls move among populations, both among DoD installations and between DoD installations and lands managed by other entities.
- Leverage Legacy funds to bring together a wide assortment of national and international partners to identify migratory linkages and prevent further population declines and listing efforts.

This work will provide a landscape level view of movements among Burrowing Owl populations which will allow conservation managers to direct their efforts appropriately. For example, reintroductions of Burrowing Owls into northern areas from which they have become extirpated will not succeed if those owls and their offspring fail to return after migration. Also, because Burrowing Owls tolerate human disturbance, their presence often overlaps with human activities such as construction, irrigation, and aircraft activity. Hence, Burrowing Owls are sometimes re-located or removed to wildlife centers. However, if some populations are isolated and likely to be distinct, re-location would be inappropriate. Moreover, periodic translocations may be detrimental to populations that rely primarily on local recruitment to maintain local population size. Conversely, if there is a high degree of connectivity among populations, removing or translocating owls will have less adverse effects on local and regional populations. This study will help resolve the questions and also provide insight into how the rapid land-use changes occurring in arid areas of the southwestern U.S. and northern Mexico are likely to influence Burrowing Owl future distribution. This information is vital to supporting the military mission because it will help identify the management role of DoD for conserving Burrowing Owls nesting in the region, potentially help prevent further listing efforts for a species that is common on DoD installations, and provide information on risk and frequency of bird strike hazards by documenting foraging and migratory habits of a breeding bird common on DoD installations in the region. Additionally, several resource managers at DoD installations have expressed an interest in more active management of the Burrowing Owls that nest at their installation. Therefore, as we find Burrowing Owls on DoD lands, we will provide resource managers at each installation with the number and locations of nest burrows. We are also providing training to DoD personnel on Burrowing Owl field techniques.

This project includes 2 major components, the first of which is administered by USGS and the University of Arizona and focuses on collection of feather samples and blood samples from Burrowing Owls on Department of Defense installations (and surrounding lands) throughout the western U.S. for stable isotope and genetic analysis. The purpose of the stable isotope and genetic analyses is to determine the extent of population connectivity of Burrowing Owls on DoD installations throughout the region. Dr. Courtney Conway (USGS) and Vicki Garcia (University of Arizona) are coordinating this part of the project. The second component is administered by Kirtland Air Force Base and Envirological Services, Inc. in New Mexico, and focuses on identifying migratory corridors for Burrowing Owls leaving Kirtland AFB in the fall, determining areas in Mexico where Burrowing Owls winter, learning more about suitable winter

habitat, finding and understanding the main threats to wintering Burrowing Owl populations, and determining areas lacking proper conditions for wintering owls. Dr. Carol Finley (Kirtland AFB) and Marianne Mershon (Envirological Services, Inc.) are coordinating this part of the project.

The two components are presented separately in this report. Section 1 (pages 5-19) focuses on the effort to collect feathers and blood from DoD installations throughout the western U.S. for stable isotope and genetic analyses. Section 2 (pages 20-27) focuses on the effort to identify migratory corridors and wintering areas for Burrowing Owls in Mexico.

Section 1: Using stable isotope and genetic analyses to determine breeding and wintering locations and population connectivity in Burrowing Owls on DoD installations throughout the southwestern U.S.

Introduction

This portion of the project focuses on collecting blood and feather samples from DoD and other facilities in the southwest and west in order to determine the breeding and wintering location of each owl and the extent of population connectivity of Burrowing Owls on each DoD installation throughout the region. Below is information on what we have accomplished thus far.

Burrowing Owl Training Workshops

We have held 3 workshops in southern Arizona to train DoD personnel and DoD contractors on methods for how to safely capture, handle, band, and collect feathers from Burrowing Owls. The workshops were held 7-9 June 2005, 27-30 June 2005, and 13 April 2006. The workshops were attended by 11 participants from 4 DoD installations and 1 DoE installation (Fort Carson Army Base in CO, Kirtland Air Force Base in NM, Holloman Air Force Base in NM, White Sands Missile Range in NM, Nevada Test Site in NV). During the workshop, each participant received one-on-one instruction and ample hands-on practice on how to handle, band, and collect feathers from at least 4 owls (often more). Additionally, we trained participants to accurately record data from Burrowing Owl captures, to store feathers, and to construct Burrowing Owl traps. We provided workshop participants with Burrowing Owl traps and banding supplies to take back to their base. We also provided participants with a booklet containing standardized protocols for Burrowing Owl banding and data collection, datasheets for recording data from captured owls, and checklists of items to take in the field when trapping owls. At the end of the workshop, each participant was competent to trap owls independently. We also trained personnel from 2 sites (Nellis AFB and Schriever AFB) at their own facilities. We have secured active participation on this project from several natural resource managers at facilities (e.g., Trish Griffin at White Sands Missile Range, Mead Klavetter at Pinon Canyon Maneuver Site, Melissa Trenchik at Schriever Air Force Base, Robert Turner at Nellis Air Force Base, and Derek Hall at the Nevada Test Site).

Participating DoD Installations and Other Cooperators

We contacted, traveled to, and surveyed for Burrowing Owls at 31 different sites that have agreed to cooperate in the project, including 26 DoD installations (Table 1; Fig. 1). We trapped, banded, and sampled feathers from 27 of these sites, 24 of which are DoD installations (see Table 2). Thus far we have sampled in 6 states, but hope to expand into several other western states next year (Idaho, Utah, Wyoming).

Table 1. List of Participants in the DoD Legacy funded-project evaluating migratory linkages of Burrowing Owls in western North America.

Barry M. Goldwater Air Force Range	AZ
Buckley AFB	CO
Boardman Bombing Range	OR
Cannon AFB	NM
Casa Grande National Monument	AZ
China Lake Naval Weapons Station	CA
City of Tucson	AZ
Davis-Monthan AFB	AZ
Dixon Navy Radio Transmitter Facility	CA
Edwards AFB	CA
Fort Bliss Army Base	NM
Fort Carson Army Base	CO
Fort Irwin	CA
Holloman AFB	NM
Kirtland AFB	NM
March JARB	CA
NAS Lemoore	CA
NAF El Centro	CA
NAS North Island	CA
Naval Outlying Field Imperial Beach	CA
Nellis AFB	NV
Nevada Test Site	NV
Pinon Canyon Maneuver Site	CO
Pueblo Chemical Depot	CO
Rocky Flats	CO
Salton Sea NWR	CA
Schriever AFB	CO
Seal Beach Naval Weapons Station	CA
White Sands Missile Range	NM
Yuma Marine Corps Air Station	AZ
Yuma Proving Ground.	AZ

Figure 1. Location of sampling locations/participants in the DOD Legacy project on Burrowing Owl migratory linkages.



Table 2. Number of Burrowing Owls sampled on DoD facilities in 2006.

FACILITY	# of occupied burrows	# owls banded in 2006	Males banded	Females banded	Unknown Adults banded	Juveniles banded
Barry M. Goldwater Air Force Range	0	0	0	0	0	0
Boardman Bombing Range	2	2	0	1	0	1
Buckley AFB	15	69	14	11	0	44
Cannon AFB	~7	0	0	0	0	0
China Lake Naval Weapons Station	tba	tba	tba	tba	tba	tba
Davis-Monthan AFB	36	82	26	32	6	18
Dixon Navy Radio Transmitter Facility	17	24	13	7	0	4
Edwards AFB	32	79	18	16	0	45
Fort Bliss Army Base	20	2	0	0	0	2
Fort Carson Army Base	9	35	3	7	0	25
Fort Irwin	0	0	0	0	0	0
Holloman AFB	11	8	0	0	0	8
Kirtland AFB	46	79	5	7	0	67
March JARB	4	15	2	3	0	10
NAF El Centro	24	49	20	21	0	8
NAS Lemoore	31	101	14	18	0	69
Naval Base Coronado	7	22	4	4	0	14
Nellis AFB	23	58	19	20	0	19
Pinon Canyon Maneuver Site	9	19	0	0	0	19
Pueblo Chemical Depot	21	63	5	14	0	44
Rocky Flats	0	0	0	0	0	0
Schriever AFB	6	16	2	6	0	8
Seal Beach Naval Weapons Station	tba	tba	tba	tba	tba	tba
White Sands Missile Range	5	21	1	3	1	16
Yuma Marine Corps Air Station	5	7	5	2	0	0
Yuma Proving Ground	5	9	3	3	0	3
TOTAL	328	760	154	175	7	424

Burrowing Owl Trapping

We hired and trained two experienced avian field technicians to travel to participating installations to trap and collect samples from Burrowing Owls during the 2006 breeding season. We obtained state and federal permits to trap owls and collect blood and feathers from owls for all of the states involved. We developed standardized protocols for each of the following activities: 1) surveying owls on DoD bases, 2) trapping adult and juvenile owls on bases, 3) banding owls, 4) collecting feather samples from adult and juvenile owls, 5) estimating Burrowing Owl demographic traits, and 6) collecting blood samples from owls on bases (to help verify the population connectivity inferred by the isotope signatures).

Including non-DoD facilities, we trapped 1,249 Burrowing Owls and collected feathers from each owl following a standard protocol in 2006. Owls were individually marked using unique color bands to identify birds that have already been sampled. We obtained feather samples from the following locations: Buckley AFB, CO; Boardman Bombing Range, OR; Casa Grande National Monument, AZ; China Lake Naval Weapons Station, CA; City of Tucson, AZ; Davis-Monthan AFB, AZ; Dixon Navy Radio Transmitter Facility, CA; Edwards AFB, CA; Fort Bliss Army Base, NM; Fort Carson Army Base, CO; Holloman AFB, NM; Kirtland AFB, NM; March JARB, CA; NAS Lemoore, CA; NAF El Centro, CA; NAS North Island, CA; Naval Outlying Field Imperial Beach, CA; Nellis AFB, NV; Nevada Test Site, NV; Pinon Canyon Maneuver Site, CO; Pueblo Chemical Depot, CO; Salton Sea NWR, CA; Schriever AFB, CO; Seal Beach Naval Weapons Station, CA; White Sands Missile Range, NM; Yuma Marine Corps Air Station, AZ; Yuma Proving Ground, AZ. We have not received all the 2006 feathers from our cooperators to date. Therefore, the total number of feathers collected in 2006 is actually slightly more than 1,249.

Preparation of feathers

The feathers collected in 2006 have been organized and stored in the Biological Sciences East Building at the University of Arizona.

Analysis of stable isotope ratios in sampled feathers

Stable isotope analysis of prepared feather samples will be conducted at the Stable Isotope Facility in the Department of Geosciences at the University of Arizona. We have met with the lab director and have discussed timing and logistics of feather analysis. Feather samples will be analyzed once we have collected ≥ 100 feather samples from each of 10 different locations.

Webpage

We have created a webpage (<http://www.ag.arizona.edu/srnr/research/coop/azfwru/cjc/>) to inform participants and other interested parties about the goals and status of the project. We are continually updating the webpage with reports, standardized protocols, datasheets, and a list of participating installations.

Literature Cited

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Appendix 1. GPS locations of Burrowing Owl nests in 2006

US State	site	UTM in Nad 27 CONUS
OR	BOARDMAN BOMBING RANGE	11 T 291125 5071911
OR	BOARDMAN BOMBING RANGE	11 T 290919 5071742
CO	BUCKLEY AFB	13 S 518667 4396540
CO	BUCKLEY AFB	13 S 518559 4396322
CO	BUCKLEY AFB	13 S 518595 4396122
CO	BUCKLEY AFB	13 S 518595 4396122
CO	BUCKLEY AFB	13 S 518703 4395863
CO	BUCKLEY AFB	13 S 520911 4395995
CO	BUCKLEY AFB	13 S 522245 4394679
CO	BUCKLEY AFB	13 S 522131 4394679
CO	BUCKLEY AFB	13 S 520543 4396562
CO	BUCKLEY AFB	13 S 520486 4396837
CO	BUCKLEY AFB	13 S 522469 4395212
CO	BUCKLEY AFB	13 S 522057 4395021
CO	BUCKLEY AFB	13 S 520006 4396835
CO	BUCKLEY AFB	13 S 521923 4394419
CO	BUCKLEY AFB	13 S 519901 4396676
CO	BUCKLEY AFB	13 S 519691 4396665
AZ	DAVIS MONTHAN AFB	12 S 514705 3559190
AZ	DAVIS MONTHAN AFB	12 S 514809 3559340
AZ	DAVIS MONTHAN AFB	12 S 514810 3559339
AZ	DAVIS MONTHAN AFB	12 S 514812 3559569
AZ	DAVIS MONTHAN AFB	12 S 514715 3559744
AZ	DAVIS MONTHAN AFB	12 S 514285 3559686
AZ	DAVIS MONTHAN AFB	12 S 514027 3559009
AZ	DAVIS MONTHAN AFB	12 S 512369 3559010
AZ	DAVIS MONTHAN AFB	12 S 512460 3558984
AZ	DAVIS MONTHAN AFB	12 S 512915 3558819
AZ	DAVIS MONTHAN AFB	12 S 513978 3559494
AZ	DAVIS MONTHAN AFB	12 S 513662 3558097
AZ	DAVIS MONTHAN AFB	12 S 515144 3557034
AZ	DAVIS MONTHAN AFB	12 S 513449 3558674
AZ	DAVIS MONTHAN AFB	12 S 512924 3557963
AZ	DAVIS MONTHAN AFB	12 S 510405 3560792
AZ	DAVIS MONTHAN AFB	12 S 510259 3560798
AZ	DAVIS MONTHAN AFB	12 S 510264 3560755
AZ	DAVIS MONTHAN AFB	12 S 510250 3561215
AZ	DAVIS MONTHAN AFB	12 S 510352 3560973
AZ	DAVIS MONTHAN AFB	12 S 510417 3561025
AZ	DAVIS MONTHAN AFB	12 S 510459 3560426
AZ	DAVIS MONTHAN AFB	12 S 510330 3560537
AZ	DAVIS MONTHAN AFB	12 S 510490 3560130
AZ	DAVIS MONTHAN AFB	12 S 510474 3561318
AZ	DAVIS MONTHAN AFB	12 S 512952 3561513
AZ	DAVIS MONTHAN AFB	12 S 512991 3561537
AZ	DAVIS MONTHAN AFB	12 S 513233 3561511

US State	site	UTM in Nad 27 CONUS
AZ	DAVIS MONTHAN AFB	12 S 513276 3561508
AZ	DAVIS MONTHAN AFB	12 S 512887 3561513
AZ	DAVIS MONTHAN AFB	12 S 512767 3561512
AZ	DAVIS MONTHAN AFB	12 S 512517 3561513
AZ	DAVIS MONTHAN AFB	12 S 512306 3561712
AZ	DAVIS MONTHAN AFB	12 S 512273 3561514
AZ	DAVIS MONTHAN AFB	12 S 513108 3561513
AZ	DAVIS MONTHAN AFB	12 S 513147 3561527
AZ	DAVIS MONTHAN AFB	12 S 512125 3561522
AZ	DAVIS MONTHAN AFB	12 S 510054 3561147
AZ	DAVIS MONTHAN AFB	12 S 509888 3561076
AZ	DAVIS MONTHAN AFB	12 S 509878 3560746
AZ	DAVIS MONTHAN AFB	12 S 509422 3561146
AZ	DAVIS MONTHAN AFB	12 S 509723 3560621
AZ	DAVIS MONTHAN AFB	12 S 509899 3561091
AZ	DAVIS MONTHAN AFB	12 S 509956 3560590
AZ	DAVIS MONTHAN AFB	12 S 509855 3560597
AZ	DAVIS MONTHAN AFB	12 S 509667 3560816
AZ	DAVIS MONTHAN AFB	12 S 512336 3557901
AZ	DAVIS MONTHAN AFB	12 S 512103 3558162
AZ	DAVIS MONTHAN AFB	12 S 509253 3560445
AZ	DAVIS MONTHAN AFB	12 S 509455 3560295
AZ	DAVIS MONTHAN AFB	12 S 509481 3560312
AZ	DAVIS MONTHAN AFB	12 S 509102 3560888
AZ	DAVIS MONTHAN AFB	12 S 509455 3561036
AZ	DAVIS MONTHAN AFB	12 S 509408 3560804
AZ	DAVIS MONTHAN AFB	12 S 509476 3561012
AZ	DAVIS MONTHAN AFB	12 S 509352 3560975
AZ	DAVIS MONTHAN AFB	12 S 509288 3561022
AZ	DAVIS MONTHAN AFB	12 S 509248 3560575
AZ	DAVIS MONTHAN AFB	12 S 509510 3560851
AZ	DAVIS MONTHAN AFB	12 S 509546 3560724
AZ	DAVIS MONTHAN AFB	12 S 512194 3561181
AZ	DAVIS MONTHAN AFB	12 S 512192 3561184
AZ	DAVIS MONTHAN AFB	12 S 512948 3560442
AZ	DAVIS MONTHAN AFB	12 S 507386 3560056
AZ	DAVIS MONTHAN AFB	12 S 507385 3560070
AZ	DAVIS MONTHAN AFB	12 S 507384 3560109
AZ	DAVIS MONTHAN AFB	12 S 512923 3556941
AZ	DAVIS MONTHAN AFB	12 S 512913 3556733
AZ	DAVIS MONTHAN AFB	12 S 512679 3556753
AZ	DAVIS MONTHAN AFB	12 S 512678 3556753
AZ	DAVIS MONTHAN AFB	12 S 512975 3556474
AZ	DAVIS MONTHAN AFB	12 S 511024 3561386
AZ	DAVIS MONTHAN AFB	12 S 510836 3561623
AZ	DAVIS MONTHAN AFB	12 S 510755 3561674
AZ	DAVIS MONTHAN AFB	12 S 510805 3561685
AZ	DAVIS MONTHAN AFB	12 S 510730 3561754

US State	site	UTM in Nad 27 CONUS
AZ	DAVIS MONTHAN AFB	12 S 510651 3561770
AZ	DAVIS MONTHAN AFB	12 S 510647 3561768
AZ	DAVIS MONTHAN AFB	12 S 511277 3561490
AZ	DAVIS MONTHAN AFB	12 S 511276 3561492
AZ	DAVIS MONTHAN AFB	12 S 512837 3557080
AZ	DAVIS MONTHAN AFB	12 S 512519 3557328
AZ	DAVIS MONTHAN AFB	12 S 512444 3557387
AZ	DAVIS MONTHAN AFB	12 S 510670 3559405
AZ	DAVIS MONTHAN AFB	12 S 510552 3559421
AZ	DAVIS MONTHAN AFB	12 S 512166 3557927
AZ	DAVIS MONTHAN AFB	12 S 512344 3557540
AZ	DAVIS MONTHAN AFB	12 S 511296 3558724
AZ	DAVIS MONTHAN AFB	12 S 511368 3558593
AZ	DAVIS MONTHAN AFB	12 S 512422 3557480
AZ	DAVIS MONTHAN AFB	12 S 511854 3558146
AZ	DAVIS MONTHAN AFB	12 S 511414 3558569
AZ	DAVIS MONTHAN AFB	12 S 511989 3557835
AZ	DAVIS MONTHAN AFB	12 S 510701 3558877
AZ	DAVIS MONTHAN AFB	12 S 510711 3558867
AZ	DAVIS MONTHAN AFB	12 S 510728 3558845
AZ	DAVIS MONTHAN AFB	12 S 510824 3558741
AZ	DAVIS MONTHAN AFB	12 S 510294 3560293
AZ	DAVIS MONTHAN AFB	12 S 510272 3559753
AZ	DAVIS MONTHAN AFB	12 S 510220 3559804
AZ	DAVIS MONTHAN AFB	12 S 510254 3560136
AZ	DAVIS MONTHAN AFB	12 S 510138 3560238
AZ	DAVIS MONTHAN AFB	12 S 510185 3560252
AZ	DAVIS MONTHAN AFB	12 S 510080 3560471
AZ	DAVIS MONTHAN AFB	12 S 510116 3560514
AZ	DAVIS MONTHAN AFB	12 S 513410 3560790
AZ	DAVIS MONTHAN AFB	12 S 513411 3560789
AZ	DAVIS MONTHAN AFB	12 S 513464 3560152
AZ	DAVIS MONTHAN AFB	12 S 513281 3557775
AZ	DAVIS MONTHAN AFB	12 S 513382 3557675
AZ	DAVIS MONTHAN AFB	12 S 513541 3557236
AZ	DAVIS MONTHAN AFB	12 S 512427 3558530
CA	DIXON NAVY RADIO Transmitter Facility	10 S 607040 4247807
CA	DIXON NAVY RADIO Transmitter Facility	10 S 607040 4247807
CA	DIXON NAVY RADIO Transmitter Facility	10 S 607014 4247824
CA	DIXON NAVY RADIO Transmitter Facility	10 S 606957 4247833
CA	DIXON NAVY RADIO Transmitter Facility	10 S 606919 4247833
CA	DIXON NAVY RADIO Transmitter Facility	10 S 606477 4247822
CA	DIXON NAVY RADIO Transmitter Facility	10 S 606991 4248242
CA	DIXON NAVY RADIO Transmitter Facility	10 S 607048 4247183
CA	DIXON NAVY RADIO Transmitter Facility	10 S 607069 4247539
CA	DIXON NAVY RADIO Transmitter Facility	10 S 607084 4247521
CA	DIXON NAVY RADIO Transmitter Facility	10 S 607093 4247477
CA	DIXON NAVY RADIO Transmitter Facility	10 S 607006 4247527

US State	site	UTM in Nad 27 CONUS
CA	DIXON NAVY RADIO Transmitter Facility	10 S 607099 4246904
CA	DIXON NAVY RADIO Transmitter Facility	10 S 607070 4247649
CA	DIXON NAVY RADIO Transmitter Facility	10 S 607156 4247472
CA	DIXON NAVY RADIO Transmitter Facility	10 S 607003 4247140
CA	DIXON NAVY RADIO Transmitter Facility	10 S 607047 4247456
CA	EDWARDS AFB	11 S 416000 3864029
CA	EDWARDS AFB	11 S 415673 3863936
CA	EDWARDS AFB	11 S 415649 3863975
CA	EDWARDS AFB	11 S 415877 3863862
CA	EDWARDS AFB	11 S 414967 3864980
CA	EDWARDS AFB	11 S 419295 3869113
CA	EDWARDS AFB	11 S 419259 3869023
CA	EDWARDS AFB	11 S 419221 3868975
CA	EDWARDS AFB	11 S 419292 3869148
CA	EDWARDS AFB	11 S 419282 3869118
CA	EDWARDS AFB	11 S 412306 3867788
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CA	EDWARDS AFB	11 S 412299 3867847
CA	EDWARDS AFB	11 S 412593 3867640
CA	EDWARDS AFB	11 S 412997 3868002
CA	EDWARDS AFB	11 S 415787 3863484
CA	EDWARDS AFB	11 S 418777 3867835
CA	EDWARDS AFB	11 S 418741 3867858
CA	EDWARDS AFB	11 S 418716 3867838
CA	EDWARDS AFB	11 S 419656 3871505
CA	EDWARDS AFB	11 S 420175 3871472
CA	EDWARDS AFB	11 S 420203 3871471
CA	EDWARDS AFB	11 S 420206 3871472
CA	EDWARDS AFB	11 S 419978 3871475
CA	EDWARDS AFB	11 S 412539 3867850
CA	EDWARDS AFB	11 S 412230 3867857
CA	EDWARDS AFB	11 S 412299 3867847
CA	EDWARDS AFB	11 S 415517 3863787
CA	EDWARDS AFB	11 S 414580 3865972
CO	FT CARSON	13 S 511225 4254574
CO	FT CARSON	13 S 521290 4257635
CO	FT CARSON	13 S 512198 4253426
CO	FT CARSON	13 S 512502 4252093
CO	FT CARSON	13 S 512502 4252093
CO	FT CARSON	13 S 512502 4252093
CO	FT CARSON	13 S 512502 4252093
CO	FT CARSON	13 S 512626 4252313
CO	FT CARSON	13 S 512626 4252313
CO	FT CARSON	13 S 512626 4252313
CO	FT CARSON	13 S 512626 4252313
CO	FT CARSON	13 S 510397 4254057
CO	FT CARSON	13 S 509734 4252719

US State	site	UTM in Nad 27 CONUS
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CO	FT CARSON	13 S 511199 4262718
CA	MARCH ARB	11 S 477432 3750019
CA	MARCH ARB	11 S 477246 3748658
CA	MARCH ARB	11 S 477440 3749988
CA	MARCH ARB	11 S 477346 3750176
CA	MARCH ARB	11 S 476445 3751894
CA	NAF EL CENTRO	11 S 625380 3631065
CA	NAF EL CENTRO	11 S 625404 3631055
CA	NAF EL CENTRO	11 S 624409 3632486
CA	NAF EL CENTRO	11 S 623856 3632486
CA	NAF EL CENTRO	11 S 623835 3632586
CA	NAF EL CENTRO	11 S 624421 3630989
CA	NAF EL CENTRO	11 S 624411 3630574
CA	NAF EL CENTRO	11 S 623954 3630939
CA	NAF EL CENTRO	11 S 624008 3630927
CA	NAF EL CENTRO	11 S 624194 3630932
CA	NAF EL CENTRO	11 S 623812 3630930
CA	NAF EL CENTRO	11 S 625916 3633334
CA	NAF EL CENTRO	11 S 625549 3631262
CA	NAF EL CENTRO	11 S 625555 3631001
CA	NAF EL CENTRO	11 S 625751 3631365
CA	NAF EL CENTRO	11 S 623913 3632988
CA	NAF EL CENTRO	11 S 626258 3632586
CA	NAF EL CENTRO	11 S 626500 3632590
CA	NAF EL CENTRO	11 S 624594 3632486
CA	NAF EL CENTRO	11 S 626016 3631547
CA	NAF EL CENTRO	11 S 626014 3631418
CA	NAF EL CENTRO	11 S 626788 3630861
CA	NAF EL CENTRO	11 S 623999 3632516
CA	NAF EL CENTRO	11 S 624067 3632491
CA	NAS LEMOORE	11 S 234786 4024219
CA	NAS LEMOORE	11 S 234843 4024009
CA	NAS LEMOORE	11 S 235084 4023461
CA	NAS LEMOORE	11 S 234720 4024031
CA	NAS LEMOORE	11 S 235422 4025593
CA	NAS LEMOORE	11 S 235385 4025712
CA	NAS LEMOORE	11 S 235182 4025675
CA	NAS LEMOORE	11 S 235170 4026146
CA	NAS LEMOORE	11 S 235422 4025593
CA	NAS LEMOORE	11 S 234203 4027647
CA	NAS LEMOORE	11 S 234063 4028104
CA	NAS LEMOORE	11 S 234203 4028370
CA	NAS LEMOORE	11 S 234109 4028059
CA	NAS LEMOORE	11 S 234188 4027628
CA	NAS LEMOORE	11 S 234314 4027353
CA	NAS LEMOORE	11 S 232992 4028126
CA	NAS LEMOORE	11 S 234223 4027581

US State	site	UTM in Nad 27 CONUS
CA	NAS LEMOORE	11 S 234069 4027976
CA	NAS LEMOORE	11 S 233988 4028200
CA	NAS LEMOORE	11 S 234093 4027887
CA	NAS LEMOORE	11 S 236309 4020851
CA	NAS LEMOORE	11 S 236242 4020886
CA	NAS LEMOORE	11 S 236250 4020526
CA	NAS LEMOORE	11 S 236322 4020767
CA	NAS LEMOORE	11 S 236250 4020526
CA	NAS LEMOORE	11 S 236280 4020540
CA	NAS LEMOORE	11 S 236222 4020871
CA	NAS LEMOORE	11 S 236176 4020308
CA	NAS LEMOORE	11 S 236094 4020507
CA	NAS LEMOORE	11 S 236111 4020554
CA	NAS LEMOORE	11 S 236127 4020695
CA	NAS NORTH ISLAND	11 S 480057 3616557
CA	NAS NORTH ISLAND	11 S 488575 3602819
CA	NAS NORTH ISLAND	11 S 480754 3616874
CA	NAS NORTH ISLAND	11 S 480731 3616887
CA	NAS NORTH ISLAND	11 S 480701 3616881
CA	NAS NORTH ISLAND	11 S 479399 3617518
CA	NELLIS AFB	11 S 675365 4008729
CA	NELLIS AFB	11 S 675315 4008401
CA	NELLIS AFB	11 S 675348 4008308
CA	NELLIS AFB	11 S 675639 4008183
CA	NELLIS AFB	11 S 675728 4008173
CA	NELLIS AFB	11 S 675842 4009817
CA	NELLIS AFB	11 S 675591 4009768
CA	NELLIS AFB	11 S 675464 4009664
CA	NELLIS AFB	11 S 675336 4009627
CA	NELLIS AFB	11 S 675148 4009697
CA	NELLIS AFB	11 S 674853 4009868
CA	NELLIS AFB	11 S 674706 4009859
CA	NELLIS AFB	11 S 674359 4010033
CA	NELLIS AFB	11 S 674351 4009995
CA	NELLIS AFB	11 S 674349 4010347
CA	NELLIS AFB	11 S 675313 4008775
CA	NELLIS AFB	11 S 675251 4008924
CA	NELLIS AFB	11 S 675832 4008871
CA	NELLIS AFB	11 S 674541 4009870
CA	NELLIS AFB	11 S 674362 4010273
CA	NELLIS AFB	11 S 674346 4010487
CA	NELLIS AFB	11 S 677965 4011311
CA	NELLIS AFB	11 S 677464 4013585
NV	NEVADA TEST SITE, DOE	11 S 578979 4099657
NV	NEVADA TEST SITE, DOE	11 S 579216 4099700
NV	NEVADA TEST SITE, DOE	11 S 562290 4109224
NV	NEVADA TEST SITE, DOE	11 S 582700 4113100
NV	NEVADA TEST SITE, DOE	11 S 580594 4114509

US State	site	UTM in Nad 27 CONUS
NV	NEVADA TEST SITE, DOE	11 S 560710 4105753
NV	NEVADA TEST SITE, DOE	11 S 561350 4108330
NV	NEVADA TEST SITE, DOE	11 S 553484 4111617
NV	NEVADA TEST SITE, DOE	11 S 590020 4067731
NV	NEVADA TEST SITE, DOE	11 S 577844 4110951
NV	NEVADA TEST SITE, DOE	11 S 582583 4111030
CO	PINION CANYON MANEUVER SITE	11 S 592597 4144651
CO	PINION CANYON MANEUVER SITE	11 S 589585 4144651
CO	PINION CANYON MANEUVER SITE	11 S 574615 4140961
CO	PINION CANYON MANEUVER SITE	11 S 592151 4145215
CO	PINION CANYON MANEUVER SITE	11 S 588485 4139634
CO	PINION CANYON MANEUVER SITE	11 S 592382 4145029
CO	PINION CANYON MANEUVER SITE	11 S 582563 4140905
CO	PINION CANYON MANEUVER SITE	11 S 589977 4145113
CO	PINION CANYON MANEUVER SITE	11 S 589172 4144714
CO	PUEBLO CHEM DEPOT	13 S 562796 4238801
CO	PUEBLO CHEM DEPOT	13 S 560892 4241124
CO	PUEBLO CHEM DEPOT	13 S 558945 4238243
CO	PUEBLO CHEM DEPOT	13 S 559776 4236728
CO	PUEBLO CHEM DEPOT	13 S 562771 4239926
CO	PUEBLO CHEM DEPOT	13 S 562384 4239485
CO	PUEBLO CHEM DEPOT	13 S 562756 4237879
CO	PUEBLO CHEM DEPOT	13 S 561443 4239362
CO	PUEBLO CHEM DEPOT	13 S 558412 4243842
CO	PUEBLO CHEM DEPOT	13 S 557993 4243885
CO	PUEBLO CHEM DEPOT	13 S 557334 4243893
CO	PUEBLO CHEM DEPOT	13 S 557343 4243921
CO	PUEBLO CHEM DEPOT	13 S 557206 4243730
CO	PUEBLO CHEM DEPOT	13 S 557213 4243054
CO	PUEBLO CHEM DEPOT	13 S 557985 4238625
CO	PUEBLO CHEM DEPOT	13 S 558316 4238588
CO	PUEBLO CHEM DEPOT	13 S 559120 4238995
CO	PUEBLO CHEM DEPOT	13 S 556861 4241750
CO	PUEBLO CHEM DEPOT	13 S 556886 4241286
CO	PUEBLO CHEM DEPOT	13 S 558688 4236500
CO	PUEBLO CHEM DEPOT	13 S 559260 4236364
CO	SCHRIEVER AFB	13 S 543652 4293160
CO	SCHRIEVER AFB	13 S 539647 4294115
CO	SCHRIEVER AFB	13 S 539946 4294293
CO	SCHRIEVER AFB	13 S 540300 4293362
CO	SCHRIEVER AFB	13 S 543599 4293990
CO	SCHRIEVER AFB	13 S 543503 4293925
NM	WHITE SANDS MISSILE RANGE	13 S 380670 3698260
NM	WHITE SANDS MISSILE RANGE	13 S 377267 3585379
NM	WHITE SANDS MISSILE RANGE	13 S 382299 3585823
NM	WHITE SANDS MISSILE RANGE	13 S 382282 3585694
NM	WHITE SANDS MISSILE RANGE	13 S 381262 3701379
AZ	YUMA MCAS	11 S 735868 3604896

US State	site	UTM in Nad 27 CONUS
AZ	YUMA MCAS	11 S 735319 3599246
AZ	YUMA MCAS	11 S 726466 3614164
AZ	YUMA MCAS	11 S 726350 3614219
AZ	YUMA MCAS	11 S 738696 3598266
AZ	YUMA PROVING GROUND AND YUMA, AZ	11 S 726855 3618051
AZ	YUMA PROVING GROUND AND YUMA, AZ	11 S 721822 3623414
AZ	YUMA PROVING GROUND AND YUMA, AZ	11 S 721813 3623412
AZ	YUMA PROVING GROUND AND YUMA, AZ	11 S 721556 3623687
AZ	YUMA PROVING GROUND AND YUMA, AZ	11 S 721569 3623687

US State	Air Force Base	UTM in Nad 27 Central
NM	Kirtland	13 S 354432 3879771
NM	Kirtland	13 S 356042 3879658
NM	Kirtland	13 S 356334 3879655
NM	Kirtland	13 S 356858 3878789
NM	Kirtland	13 S 356987 3879148
NM	Kirtland	13 S 357801 3878784
NM	Kirtland	13 S 357825 3879242
NM	Kirtland	13 S 357865 3879083
NM	Kirtland	13 S 357874 3878686
NM	Kirtland	13 S 358021 3879106
NM	Kirtland	13 S 358091 3879132
NM	Kirtland	13 S 358194 3879044
NM	Kirtland	13 S 358199 3878878
NM	Kirtland	13 S 358387 3878900
NM	Kirtland	13 S 358543 3877765
NM	Kirtland	13 S 358630 3878730
NM	Kirtland	13 S 359040 3881298
NM	Kirtland	13 S 359359 3881329
NM	Kirtland	13 S 359810 3880123
NM	Kirtland	13 S 359879 3881313
NM	Kirtland	13 S 361241 3877120
NM	Kirtland	13 S 361505 3877210
NM	Kirtland	13 S 361783 3877581
NM	Holloman	13 S 392098 3642876
NM	Holloman	13 S 392112 3462531
NM	Holloman	13 S 392138 3643693
NM	Holloman	13 S 392216 3642985
NM	Fort Bliss	13 S 428667 3588271

Section 2: Collaborative Efforts to Determine Wintering Grounds and Habitat Quality for Burrowing Owls (*Athene cunicularia*) in México

During the 2006 breeding season on Kirtland Air Force Base (KAFB), surveys for the presence of Burrowing Owls began March 23 and continued into June. A total of 46 owl pairs were located on the base and monitored for breeding activity (copulation, incubation, presence of nestlings and fledglings). Of the 46 pairs monitored, only 23 of these pairs fledged young (as of August 10), which was 50% of the pairs monitored. A total of 103 fledglings were produced, resulting in an average of 4.5 fledglings per pair that fledged young or 2.2 fledglings per pair on KAFB. The number of fledglings at each nest ranged from zero to eight.

Trapping and banding of adult and nestling Burrowing Owls was conducted throughout the season on KAFB. Seventy nine owls were trapped in 2006, of which 12 were adults (5 males and 7 females) and 67 were nestlings. Owls banded were fitted with aluminum Fish and Wildlife Service bands and plastic color bands. Feather samples were taken from all 79 owls for stable isotope analysis.

From band returns we could determine that twelve Burrowing Owls that were banded on KAFB in previous years returned in 2006. Nine of these owls were banded in 2005, 2 were banded in 2004, and one was banded in 2003. Of the owls banded in 2005, 4 owls were banded as juveniles, 4 owls were banded as adult males, and one owl was banded as an adult female. Of the owls banded in 2004, one was banded as a juvenile (this owl also returned to KAFB as a breeding male in 2005) and one was banded as an adult male. The owl banded in 2003 was banded as an adult female. We will know more about owls returning to KAFB to breed once the stable isotope data is obtained.

Twenty eight juvenile Burrowing Owls were fitted with radio telemetry units (on 172 MHz) to help determine where the owls that breed on KAFB disperse and spend the winter. Surveys for the owls with telemetry units will be conducted by air and by ground. Environmental Flying Services (www.eflying.org) was contracted to fly over Mexico from October 12 to October 26. We will be flying four hours a day, which is the fuel limit of the plane, for 60 hours total of flight. Transects will be developed for use in aerial surveys. These transects will be designed according to information we have obtained about wintering territories of owls in Mexico, as well as appropriate habitat for owls. The telemetry equipment for use during flights was purchased from Lotek Wireless. It includes a radio receiver, a signal switch box, two four-element Yagi antennas to be mounted on the wings of the plane, mounting brackets to secure the antennas, and headphones for use in the plane. Surveys by car will be conducted from October 12 to October 30 in order to cover more area and to back up the surveys by plane if an owl is located. Equipment for ground surveys will be purchased, including a receiver, an omni-directional antenna to place on top of the car, and a hand held antenna.

While the owls with telemetry units are still on KAFB, dispersal studies are being conducted to learn more about what areas of KAFB are used by owls on dispersal. Scanning sessions are carried out at vantage points on base, as well as at owl nest territories and other prairie dog colonies. As of August 10, some owls have left their natal territories and KAFB boundaries, while others are still found within expanded natal territories.

As part of the collaboration links established for this project, Ham radio enthusiasts were contacted to listen in on the owl frequencies and report what they register. A summary of the project and contact information was sent to the major amateur radio news services and posted on

their web sites; Homing In (www.homingin.com), Amateur Radio Newsline (<http://www.arnewsline.org/>), ARRL The National Association for Amateur Radio (www.arrl.org), and Ham Radio on the Net (www.eham.net) (Appendix A). The announcement also went out to the subscription based Biotrackers mailing list.

Appendix A. Internet advertisements for HAM radio enthusiasts to solicit volunteers to listen in for Burrowing Owl radio telemetry frequencies, summer 2006

From: Homing In: www.homingin.com



For six years, ham operators and scanner enthusiasts have supported wildlife researchers by monitoring and tracking the radio tag signals of Burrowing Owls, Indiana Bats and other endangered or threatened species. This summer, volunteers are needed to help two scientific organizations. Radio-tagged Burrowing Owls will soon leave Albuquerque, New Mexico for parts unknown. Purple Martins in Pennsylvania are also being tagged for a migration study. Your help is needed for the owl study if you live in eastern and southwestern states, as well as Mexico. Monitors in eastern states are needed for the Martin study. With your scanner or wide-coverage multi-mode ham receiver, you could listen for these radio-tagged birds from the comfort of your home. This site tells [all about these and other projects](#), and there are additional pages here about equipment for wildlife tracking, monitoring techniques, and signal identification.

Hams and Monitoring Enthusiasts Needed

To Help Researchers

Wildlife Monitoring/Tracking Opportunities -- Owls and Martins

by Joe Moell KØOV

Volunteer ham radio operators and VHF monitoring enthusiasts are helping scientists track the movements of endangered critters. With your scanner or extended-range hand-held transceiver plus an outside antenna, you could join in and perhaps make valuable contributions. Read on for all the news of current and upcoming projects.

Biologists want to know about the effects of habitat, diet, dispersal, migration and predation on many species of concern. Radio tracking is an important tool for them. However, it's not easy for a few researchers to track the ones that move large distances, such as migratory birds. They sometimes use small aircraft to increase radio tracking range, but that's very expensive and requires consistent good weather. What they need is a large number of widely-spaced receiving stations, covering the entire possible migration area. That's not financially practical either, but there are many radio hobbyists scattered out there. Why not have them help?

In 1998 at the request of Helen Trefry, a Canadian biologist, Homing In readers in central and western states began carefully tuning their receivers each fall and spring, listening for weak pulsed signals from radio tags on Western Burrowing Owls. We've also provided volunteer support to Burrowing Owl researchers in the state of Washington and the provinces of Saskatchewan and Alberta, as you can read in the [Owl Project History](#) page of this site. These project have helped scientists learn the migratory habits of these threatened birds, which have been shown to travel almost 2200 miles to their winter homes in Mexico and southern states.

Since then, the informal Biotrackers group has participated in studies of [Saw-whet Owls](#), Sandhill Cranes, American Woodcocks, Mexican Long-nosed Bats and [Indiana Bats](#). This year, biologists in New Mexico are studying the local Burrowing Owl populations, Canadian researchers are studying Purple Martins, and Texas wildlife rehabilitation specialists are working with Great Horned Owls. Read on to find out how you can help them by listening to VHF radio in your home and vehicles.

Burrowing Owls -- New Radiotracking Research in Southwestern States Summer/Fall 2006

On 17 July 2006, e-mail arrived from Kirsten McDonnell, Chief Biologist of Envirollogical Services, Incorporated.

"[Envirollogical Services](#) is a small non-profit located in New Mexico. We are contracted through Kirtland Air Force Base (Albuquerque, New Mexico) to study and monitor the population of Burrowing Owls located on the base property. As you know, Burrowing Owls are a species of concern because of their declining numbers, and in order to determine if their migration and winter habitats are a cause for this decline, we need to learn more about where these owls are traveling for the winter.



"On Kirtland Air Force Base this summer, we have attached 28 transmitters and will be flying over Mexico in October in a Cesna 182 to search for their signals. Last winter we drove through 21 states of Mexico searching for owl territories and also had a group of Mexican collaborators conducting surveys for owls, to give us more information for this year flying.

"Our owls probably will leave on migration in August and the transmitter signals should last into December. We are not sure where the owls will go. From Albuquerque, it is possible they may head southeast or southwest towards the coasts, or possibly they will take a more traditional migratory route to the south. For this reason it will be helpful to have people from all over the southwest (New Mexico, Texas, Arizona, California) searching for their signals. I know you have been of great help on other similar projects, and we would really appreciate your help on this one."

Update received 20 July 2006: "As of today, all 28 owls with transmitters are still on their territories on Kirtland. Our data and observations show that owls may begin to leave the base by the end of July, but most will depart sometime in August and some may remain into September, depending upon weather conditions."

Here is the list of frequencies:

172.018	172.068	172.098	172.119	172.147	172.169	172.209
172.239	172.259	172.282	172.331	172.438	172.460	172.475
172.501	172.572	172.622	172.645	172.701	172.723	172.741
172.781	172.821	172.847	172.863	172.901	172.964	172.981

As it is received, more information will be posted in this Homing In Web site, including contact information for the researchers. You can also follow this project on the [Biotrackers mail list](#).

From: Amateur Radio Newsline: www.arnewsline.org

For July 28, 2006

THAT FINAL ITEM: ITS BURROWING OWL TIME AGAIN

And finally this week, its owl time once again. Of course we are referring to those famed Burrowing Owls that are making ham radio news again. Newsline's Joe Moell, K0OV, with the story:

Back in 1998, a researcher in Canada asked for help in locating some radio-tagged Burrowing Owls that had migrated from their study site in Saskatchewan. Aircraft had been unable to follow them due to bad weather. So began the first of many efforts by some hams and scanner enthusiasts to help biologists find their wayward study animals. Since then, we've been involved in research on several species of birds and bats.

This summer, two bird studies need ham help. A non-profit organization in New Mexico wants to find out what happens to the population of Burrowing Owls that spend summer months in the grasslands of Kirtland Air Force Base. They have radiotagged 28 of them to see if they go east toward Texas, west to California, or south to Mexico. They will start moving any day now, so get your receiver and antenna ready.

About the same time, researchers at two Toronto universities will be radiotagging twenty young Purple Martins at a breeding colony in Edinboro, Pennsylvania. They are expected to start south in August, but where will they spend the winter?

For the radio tag frequencies, plus more information on how you can help the scientists from the comfort of your hamshack, point your Web browser to www.homingin.com. That's homingin, as one word, homingin.com. Thanks in advance for your help. From southern California, where we'll be listening for those owls from Albuquerque, this is Joe Moell K-zero-Oscar-Victor for Amateur Radio Newsline.

Again that website is www.homingin.com.

From: ARRL The National Association for Amateur Radio: www.arrl.org



Hams, monitoring enthusiasts invited to aid wildlife researchers (Jul 25, 2006)
-- Wildlife researchers are asking radio amateurs and VHF monitoring enthusiasts to help listen for radio tag signals from migrating birds. A non-profit organization in New Mexico wants to find the wintering grounds of the burrowing owl, which summers in the grasslands of Kirtland Air Force Base. "Twenty-eight of the birds have been fitted with pulsing radio-tags near 172 MHz, and attempts will be made to track them by aircraft to see if they go east toward Texas, west to California, or south to Mexico," says ARRL Amateur Radio Direction Finding (ARDF) Coordinator

Joe Moell, K0OV. "It's likely that aircraft will lose contact with most of the owls, so volunteers throughout southwestern states and northern Mexico are being asked to listen for them." Moell said July 25 that the birds "will start moving any day now." Meanwhile, researchers at two Toronto universities are radiotagging 20 young purple martins at a breeding colony in Edinboro, Pennsylvania. "These beautiful birds are expected to start flying south in mid-August, probably to winter grounds in South America," Moell says.

"Hams in southern states from Texas through Florida are asked to be listening and possibly detect the flyovers." He says those living in the migration zones and can receive 172 MHz signals can help. "If you have radio-direction finding equipment for VHF, so much the better," he adds. Moell's "[Homing In](#)" Web site has much more information on these projects. [Joe Moell, K0OV, Photo]

[Link to this story](#)

Hams, Monitoring Enthusiasts Invited to Aid Wildlife Researchers:

Wildlife researchers are asking radio amateurs and VHF monitoring enthusiasts to help listen for radio tag signals from migrating birds. A non-profit organization in New Mexico wants to find the wintering grounds of the burrowing owl, which summers in the grasslands of Kirtland Air Force Base.

"Twenty-eight of the birds have been fitted with pulsing radio-tags near 172 MHz, and attempts will be made to track them by aircraft to see if they go east toward Texas, west to California, or south to Mexico," says ARRL Amateur Radio Direction Finding (ARDF) Coordinator Joe Moell, K0OV. "It's likely that aircraft will lose contact with most of the owls, so volunteers throughout southwestern states and northern Mexico are being asked to listen for them."

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"These beautiful birds are expected to start flying south in mid-August, probably to winter grounds in South America," Moell says. "Hams in southern states from Texas through Florida are asked to be listening and possibly detect the flyovers."

He says those living in the migration zones and can receive 172 MHz signals can help. "If you have radio-direction finding equipment for VHF, so much the better," he adds.

Moell's "Homing In" Web site <http://www.homingin.com/> has much more information on these projects. The site includes frequencies and equipment suggestions as well as a descriptions of the unique characteristics of wildlife tags to help listeners distinguish them from other signals they may encounter at 172 MHz. The site also tells how to join the BIOTRACKERS mailing list for the latest updates and discussions of wildlife-tracking topics.

Source:

The ARRL Letter Vol. 25, No. 30 July 28, 2006

From: Ham Radio on the Net: www.eham.net

Hams Monitor Migrating Birds:

[Joe Moell \(K0OV\)](#) on July 26, 2006

[Add a comment about this article!](#)

After a one-year hiatus, ham operators are again being asked to help wildlife researchers by listening for radio tag signals from migrating birds. Two projects are about to start:

1. A non-profit organization in New Mexico wants to find the wintering grounds of the Burrowing Owls that spend summer months in the grasslands of Kirtland Air Force Base. Twenty-eight of the birds have been fitted with pulsing radio-tags near 172 MHz and attempts will be made to track them by aircraft to see if they go east toward Texas, west to California, or south to Mexico. It's likely that aircraft will lose contact with most of the owls, so volunteers throughout southwestern states and northern Mexico are needed to listen for them. They will start moving any day now.

2. Researchers at two Toronto universities will soon be radiotagging twenty young Purple Martins at a breeding colony in Edinboro, Pennsylvania. These beautiful birds are expected to start flying south in mid-August, probably to winter grounds in South America. Listeners in southern states from Texas through Florida are asked to monitor and possibly detect the flyovers.

If you live in the target areas and can receive 172 MHz signals, you could help. If you have radio-direction finding equipment for VHF, so much the better. The [Homing In Web site](#) has more information on these projects, including frequencies and suggestions for equipment and antennas. It includes a page that describes the unique characteristics of wildlife tags to help listeners distinguish them from other signals they may encounter at 172 MHz

Thanks in advance for your help!
Joe Moell K0OV