

ADOPT A WILD RAPTOR!



CONTRIBUTE TO RVRI THROUGH OUR 'ADOPT A RAPTOR PROGRAM'

When you adopt a raptor, you will receive a packet which includes an adoption certificate specific to your individual bird with band number, wing tag (*Golden Eagle only*), age, sex, size and when and where it was banded. You will also be notified of any follow-up information regarding re-sightings, re-capture and recoveries. Furthermore, you will get a 4 x 6 color photo of your adopted bird and an informative Natural History fact sheet.

AVAILABLE RAPTORS

Sharp-shinned Hawk.....	\$25
American Kestrel	\$25
Cooper's Hawk	\$35
Northern Harrier	\$35
Merlin	\$45
Prairie Falcon	\$45
Red-tailed Hawk	\$50
Rough-legged Hawk	\$50
Swainson's Hawk.....	\$75
Northern Goshawk	\$100
Golden Eagle	\$150
Golden Eagle with satellite transmitter	\$1000



WRITE DOWN THE RAPTOR YOU WANT TO ADOPT IN THE SPACE PROVIDED IN THE ENCLOSED ENVELOPE

We are a 501(c) 3 non-profit organization; all donations are tax deductible. A receipt for your tax records will be provided.

**RAPTOR VIEW
 RESEARCH
 INSTITUTE**
 P.O. BOX 4323
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WINTER 2008 - 2009

RAPTOR VIEW

RESEARCH INSTITUTE



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LETTER FROM THE PRESIDENT

Hello everyone and welcome to our fourth annual newsletter. We had a productive year in 2008, building on our existing projects and picking up a few new ones. From our Osprey research along the Clark Fork River and our Swainson's Hawk work on the grasslands west of Missoula to our ever-expanding Golden Eagle and raptor migration studies, our education outreach and research collaborations continue to grow - in ways simply unimaginable to me back in 2004 when RVRI was founded.

2008 held some notable highlights for RVRI. Perhaps the biggest was our participation in the annual Raptor Research Foundation Conference (RRFC), an international meeting of raptor biologists featuring the latest and most significant research on raptor biology, hosted this year right here in our hometown

of Missoula, Mont. A big thanks to friends and colleagues, Dr. Erick Greene, with the University of Montana, and Kate Davis, executive director of Raptors of the Rockies, for their hard work and tireless dedication in making this conference a huge success. Since RVRI was established, nearly five years ago, we have worked to contribute to this body of knowledge on raptor research. Being able to participate in such a highly regarded event as the RRFC had the feeling of a coming out party for RVRI.

I can't help recalling my first RRFC back in 1998 in Ogden, Utah. I was encouraged to attend by my friend and mentor Denver Holt, founder and director of the Owl Research Institute (ORI), Charlo, Mont., located in the beautiful Mission Valley. Denver drove me down, shared his hotel room with me and I think even loaned me

(cont'd next page)



Tyler Veen photo

..... A Red-tailed Hawk (Harlan's morph)



some decent clothes for the occasion. After all, I was a financially strapped freshman in college - but a dedicated volunteer for ORI. Thanks, Denver.

Back in 1998, I was still a relative newcomer to the field of avian research, and being in the presence of all these eminent researchers was a formative experience. I intently listened to the presentations and even got to meet a few of the experts. I was inspired yet somewhat intimidated. I also wondered when - or even if - I ever would be a contributor to this impressive body of knowledge. Could I ever stand up in front of all those scientists and actually present some of my own findings? One thing was for sure, a seed had been planted.

Fast forward 10 years to September 2008, and RVRI was in the midst of the conference. RVRI staff members, research partners and I presented five of our projects: the Golden Eagle Blood-Lead Project, Golden Eagle Isotope Study, Golden Eagle Sexing Project, Osprey Heavy Metal Project and Osprey Baling Twine Project. I am happy to report that all presentations were well received.

During the 2008 RRF, RVRI was asked to lead a field trip for the visiting researchers to our fall raptor research station on Nora Ridge. Interest in the field trip was high, and the available spots filled up quickly, so we added another day to accommodate a total of more than 30 attendees. I was re-

minded again of the 1998 meetings in Utah where I participated in a field trip to Hawk Watch International's Goshute Mountain site for hawk watching and banding. Now, here I was leading the trips!

The field trips RVRI were a great success. In two days, we banded 19 raptors including five Golden Eagles, two of which we outfitted with satellite transmitters. Indeed, we couldn't have scripted a better outing! In attendance were many of the biggest names in raptor research, some who had traveled to Montana from as far away as China and France. Thanks go to our dedicated field team of volunteers and RVRI personnel, who contributed to our success at this year's conference. (for more details, please see RRF Field Trip section)

RVRI field trips form a cornerstone of our group's mission of education and conservation. We are proud to report hosting numerous field trips to Nora Ridge in 2008 as donations to local charitable events and fundraisers. Attendees are treated to the same experience as our professional counterparts. We feel this is one of the most important aspects of our work, helping out where we can and giving back to the western Montana communities that have been so generous to us. Please contact us for more information on arranging field trips with RVRI.

Unfortunately, there are some downs to report. Recent evidence shows a

ten-year-decline in the number of observed spring migrating Golden Eagles. Threats are numerous and almost all are human-caused. In addition, Montana's Osprey population may be suffering due to exposure to Mercury and other heavy metal toxins related to historic gold mines, as well as from baling twine encounters. We are working diligently to learn more, share our findings, and find solutions. Please see related sections for more details.

In closing, as you read this newsletter, you will see that RVRI continues to strive to do our best and stay true to our mission of research, conservation and education. RVRI is a 501(c) 3 tax-exempt organization, funded by foundation grants, business support and individual donations. We hope that you will consider us for a tax-deductible contribution. Your support is needed and will ensure the continuation of our programs and efforts to protect raptors and the shared environment which supports us all. Thank you.



Sincerely,

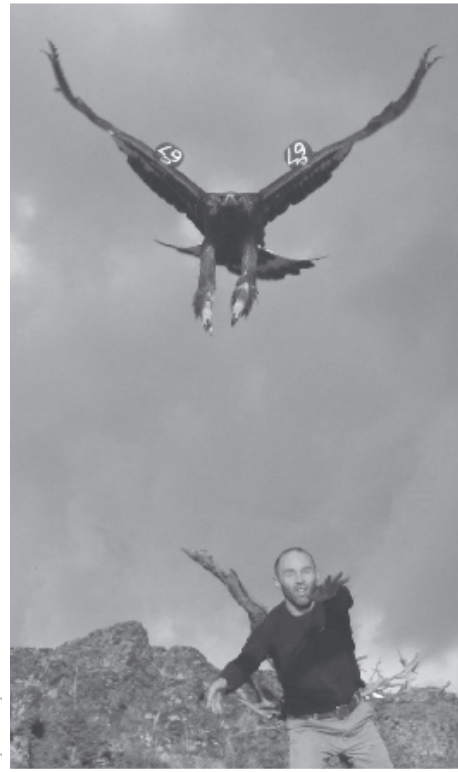
Rob Domenech

Rob Domenech, RVRI President

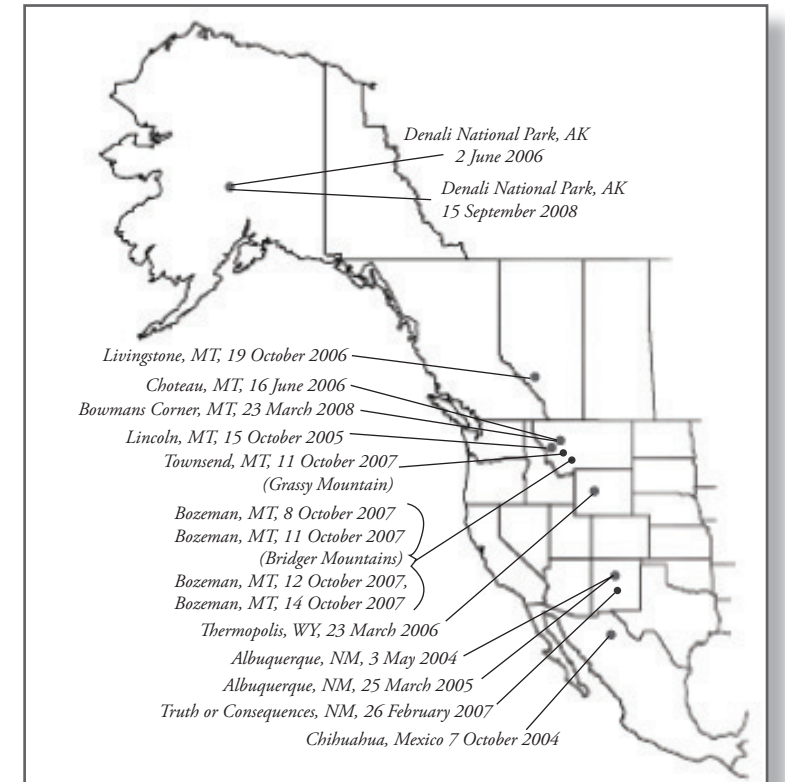


RVRI has been applying vinyl wing-tag markers (blue with white alpha-numeric) on all captured Golden Eagles since 2004, and to date roughly a 109 migrant eagles have been marked from our stations. We have found this technique considerably more effective than banding alone as a means of identifying individuals and receiving return information on banded birds.

Information from these encounters can offer us some idea about where migrant Golden Eagles are wintering and breeding, how far they have traveled and how long they live, as well as causes of mortalities. In 2008 we received two new reports on wing-tagged eagles.



Rob releases Golden Eagle C-67



Wing-tagged Golden Eagle re-encounter locations

THE RAPTOR RESEARCH FOUNDATION FIELD TRIPS

We were thrilled to host two, back-to-back field trips to our Nora Ridge research station for the 2008 Raptor Research Foundation conference. Originally, we had planned for only one day, but due to high demand we added the extra day. In total we had nearly 30 participants. I have to confess I felt a little nervous, as these weren't just any visitors; these were serious raptor biologists, some world renowned. Anticipa-

tion was high as we wanted to showcase our project and give everyone the experience they had signed on for, to see dozens of Golden Eagles on migration and the opportunity to work with these incredible raptors up close.

Our team was in full force, with Fred and Cathy Tilly heading the count from the lookout 1.5 miles up ridge and calling in raptors to the banding station. They were assisted by Tyler Veto. Trapping

from the blinds we had Stephen "Step" Wilson, Bryan Bedrosian (who seemed to be everywhere at once!), Pat Little and myself. If this weren't enough, we had Bill Clark (world renowned raptor expert) trapping backup. Bill caught an adult Golden Eagle! Finally, we had a banding station loaded with raptor biologists ready to lend a hand.

As it turned out, the weather was beautiful with sunny skies and moder-

ate southwest winds, perfect conditions for migrating raptors. Simply put, we could not have scripted two better days on site. We banded a total of 19 raptors including five Golden Eagles and two Harlan's Hawks! Two of the adult Golden Eagles were outfitted with satellite transmitters. Trapping and processing raptors was nearly continuous. I can safely say that we all experienced two unforgettable days on site! Thank you all.



Raptor Research Foundation field trip

EDUCATION



RVRI continues to offer free, hands-on outdoor educational workshops for local school groups, youth homes, college students, community organizations, the general public, and for charitable events. We feel that 'the informal, non-traditional classroom' is a great way to augment conventional approaches to learning, while exposing students to a very unique outdoor education experience. We are able to involve students from a variety of backgrounds and circumstances in all aspects of raptor research, and introduce them to key ecological principles, raptor ecology, and conservation biology.

Raptor View's Education Curriculum

RVRI offers a comprehensive educational curriculum designed and written by Noel Nies-Nesmith, as part of her Masters Degree in Education. Noel deftly merges field research techniques and classroom learning into an informative, fun and complete format designed primarily for middle and high school age students.

Schools and youth groups participating in our educational programs include:

Missoula Youth Homes (MYH), Seeley-Swan High School, Willard Alternative High School, Flagship Youth Program, WORD (Summer Arts and Leadership Camp), Clark Fork Watershed Education Project, Natural History Center and others. All of these kids are enthusiastic and have experienced a unique view into wildlife conservation that few kids ever see.

New Programs and Projects

The education aspect of the Osprey Project really took off this summer and was amazingly successful with over 300 kids from a variety of youth based organizations participating. This simply would not have happened if not for the dedicated efforts of Dr. Erick Greene and Dr. Heiko Langer along with undergrad U of M students Anicka Katrina-Hathaway and Amanda Ormesher and Hellgate High School students Mat Parker and Max Egenhoff. Thanks all!

Coming this summer 2009 "Osprey Cam"

We will introduce the latest addition to our educational outreach, the OSPREY CAM! This is part of our on-going Osprey Project and will be a perfect fit with Noel's curriculum. We can think of no better way to introduce area school kids of all ages to Osprey ecology.

Very special thanks to:

Ryan Alter of Alter Enterprises, who has generously donated his technical know how. Paul Nisbet with Vann's who arranged for the donation of the camera, David Lopez of Missoula Electric Coop, Eric Ashcroft of A & S Electrical, Jim and Marci Valeo with nest platform access, and last but by no means least Dave Taylor and Rob Magana of Dave Taylor Roofing for fabrication and installation of the camera mount.

Day in the Field

RVRI donates a day in the field for local community fundraisers, charitable events and other non-profit organizations. The day is spent working with RVRI biologists on one of our research projects. Most trips are to our fall raptor migration and Golden Eagle research site. Participants assist directly in all aspects of our field work. We enjoy sharing our research and are glad we can help. Our days in the field have brought in donations of up to \$1,000.

Groups and charities include: the Natural History Center, Grounded Eagle Foundation, AniMeals, Missoula Children's Museum, Missoula Carousel Association, Footloose Montana, Jayden Summerfield Fund, NPR Public Radio, YMCA (Christine Doyle Fundraiser), Jodi Marshall Fundraiser and others. Please feel free to contact us if you think we can help.



Erick Greene photo

Summer Camp students observe nesting Osprey

RESEARCH



FALL MIGRATION AND BANDING RESEARCH FROM NORA RIDGE

This fall we successfully completed our third season of banding and observation from Nora Ridge along the Rocky Mountain Front (RMF) in west-central Montana.

Our trapping team was in full force as we focused all our effort on Nora Ridge. Everyone was highly motivated and couldn't wait for the flight to get started. Our team included RVRI executive director Rob Domenech; apprentice trapper Tyler Veto, back for a second fulltime season and Vince Slabe, experienced raptor trapper and biologist who co-led the Grassy Mountain site in 2007 and has been with RVRI since 2004. Additionally, we were very fortunate to have Bryan Bedrosian with Craighead-Beringia South on site for all of peak season. Bryan brings much skill and experience to the team and seemed to be everywhere at once during those busy eagle days.

We were also privileged to have veteran raptor trapper, Stephen "Step" Wilson join us for the first time. Step has accumulated years of experience handling raptors at banding stations all over the country. He is a delight to work with and his passion for raptors was infectious. Also on board was experienced raptor trapper Pat Little. Pat recently moved to our area via Seattle by way of England. Along with his trapping and banding skills, Pat brought with him a certain calm and sometimes off-beat sense of humor that fit in well with the crew.

In addition, we were honored and thrilled to have two of the world leading experts on raptors and Golden Eagles visit us for several days, Bill Clark and David Ellis. Frankly, I had a hard time believing that these guys were actually onsite! I guess all this hard work is paying off.

Big thanks to Bill for catching that second adult Golden Eagle of the day, which we promptly instrumented with a satellite transmitter. It was great to hear Bill's "eagle scream" over the radio. A huge thank you goes out to Fred and Cathy Tilly for all their expertise and guidance. Finally, thanks to everyone for making 2008 the most productive and memorable season yet!



Tyler Veto photo



Etna Hin photo

Bill Clark and Vince Slabe examine wing molt on second-year Golden Eagle

Banded and ready to go

RESEARCH

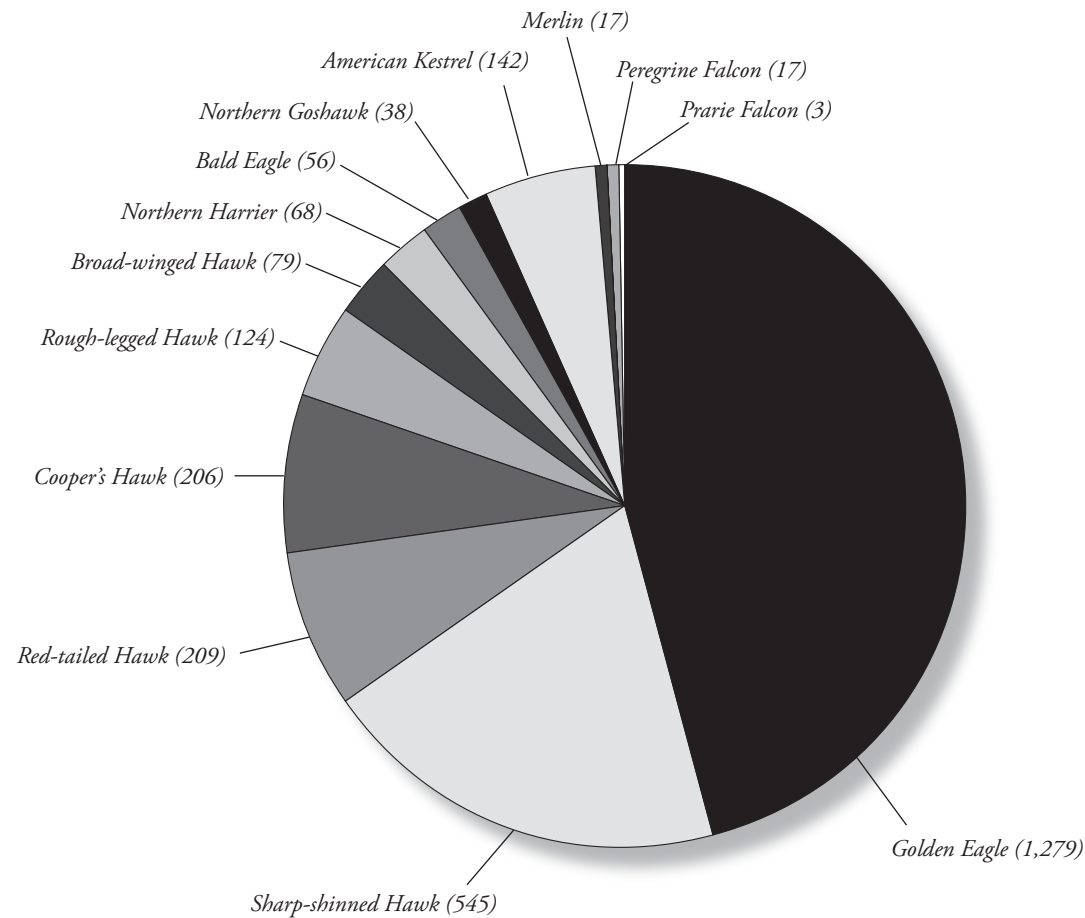


GOLDEN EAGLE AND FALL RAPTOR MIGRATION COUNT FROM NORA RIDGE

The Nora Ridge count was headed up by veteran raptor migration specialists Fred and Cathy Tilly, whose skills, stamina and overall expertise are invaluable to this project. The numbers and species composition of migrants at Nora Ridge were very good, and the 360-degree view from the north ridge observation point allowed Fred and Cathy to detect passing migrants from all directions.

Count Totals

Observations were conducted from Sept 1 through October 29 for 59 days; nine days were suspended due to impossible weather conditions. We totaled 2,905 raptor migrants in 341 hours of observation, comprised of 17 species, including Turkey Vultures. The Golden Eagle total came in at 1,279 and comprised 44 percent of all observed migrants. Our highest count occurred on October 15th when Fred and Cathy tallied 190 raptors, including 159 Golden Eagles. Unfortunately, from October 9th through the 12th, we had extremely bad weather in the form of socked-in, cloudy conditions. Also during this time we had 18 inches snow fall on the ridge. This is typically a peak flight period for the eagles and we suspect we missed hundreds of migrants as a result.



Raptors species observed

Golden Eagles 1,279 (44%), Sharp-shinned Hawks 545 (19%), Red-tailed Hawks 209 (7%), Cooper's Hawks 206 (7%), Rough-legged Hawks 124 (4%), Broad-winged Hawks 79 (3%), Northern Harriers 68 (2%), Bald Eagles 56 (2%), Northern Goshawks 38 (1.5%), American Kestrels 142 (5%), Merlins 17, Prairie Falcons 3, Peregrine Falcons 17 and 1 Gyrfalcon. Percentages were not included for birds totaling less than one percent.

RESEARCH



BANDING SUMMARY, NORA RIDGE

Capture Summary Nora Ridge 2008

AK	3
BE	4
BW	1
CH	17
GE	28
GR	0
ML	1
NG	9
NH	3
PG	1
PR	0
RL	2
RT	23
SS	65
Total	157

We trapped from September 9th through October 27th (weather permitting), for a total of 34 days. We banded a total of 157 raptors, including 28 Golden Eagles.

Highlight captures include: 7 Harlan's Hawks (currently considered a subspecies of Red-tailed Hawk), an adult Broad-winged Hawk and 64 Sharp-shinned Hawks (a new RVRI seasonal high!). We also caught our 2 adult Golden Eagles back-to-back and outfitted both with satellite transmitters. Of course I think I can speak for everyone in saying the entire season was a highlight.



Cooper's Hawk



Immature Bald Eagle

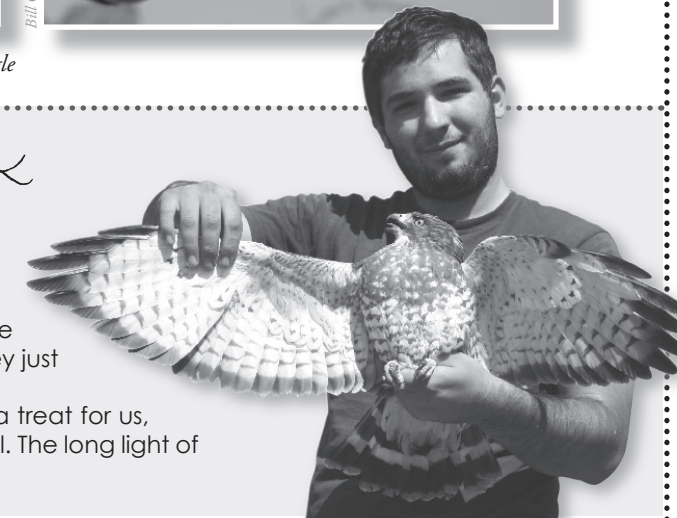


(Left) Rob with dark morph Harlan's Hawk, (Right) Adult Golden Eagle



BROAD-WINGED HAWK COUNT SETS RECORD

At 79, the Broad-winged Hawk flight this season was the highest on record for Montana. On September 16th we had an amazing flight with 31 recorded for the day! They just streamed in from the east off the plains and circled up between our lookout and banding station. It was truly a treat for us, as they flew right there in front of us...high, low, eye-level. The long light of late afternoon made it all the more spectacular!



Tyler Veto with Broad-winged Hawk

RESEARCH (CONTINUED)



ADULT GOLDEN EAGLE

SATELLITE TRACKING STUDY 2008

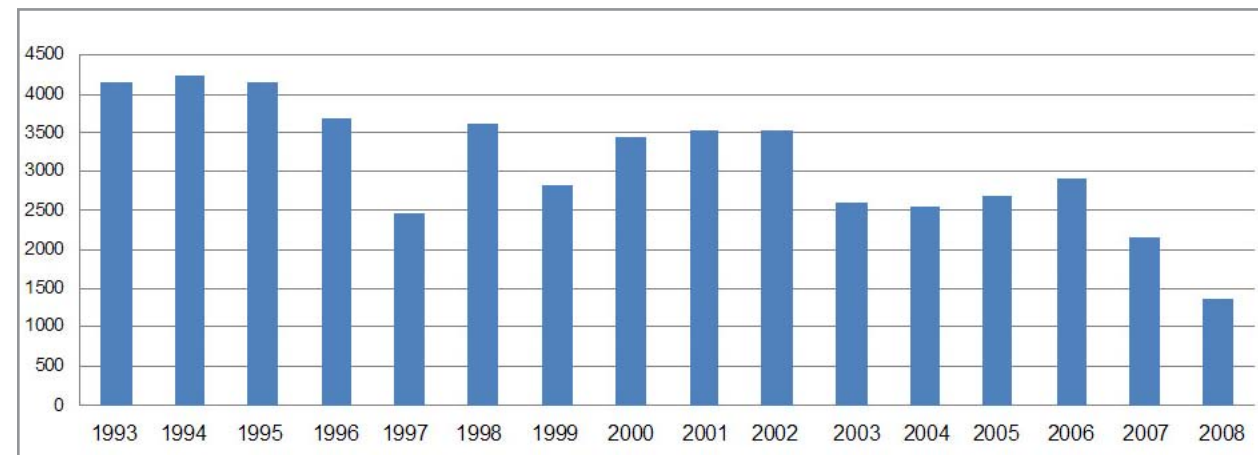
Compared to young Golden Eagles, adults are far less studied on migration with satellite transmitters. This is largely due to the difficulty of capturing wary adults. We can learn more about Golden Eagle migratory ecology as a whole by studying adults, as they are proven survivors and have completed their migratory journeys many times over.

A recent breakdown of Mt. Lorette raptor migration and Golden Eagle point count data shows a significant decline in the number of observed Golden Eagles migrating north. The purpose of annual, long-term raptor migration monitoring project is to detect changes and trends in raptor populations. Mt. Lorette is located along the Rocky Mountain Front in Alberta, Canada; this region produces the largest number of migrating Golden Eagles known in the world. Counts are headed by Peter Sherrington, with the Rocky Mountain Golden Research Foundation.

Additional data from Hawk Watch International's former spring Rogers Pass raptor point count conducted exclusively by Fred and Cathy Tilly supports this downward trend. This count ran from 1990 - 2002 with a steady decline of observed migrants occurring from 1998 - 2002. The count was discontinued in 2002, due to the low number of migrants.

Mt. Lorette Spring Seasonal Golden Eagle Totals, 1993-2008

The following bar graph illustrates Golden Eagle seasonal totals from Mt. Lorette, Alberta. As you can see there is clearly a downward trend.



* Table and analysis by Fred Tilly, veteran raptor migration specialist and regional editor for Hawk Migration Association of North America.

** Number of eagles on Y axis, count year on X axis

This trend is worrisome and points to likely environmental problems occurring on Golden Eagle wintering areas across the West in the Lower 48.

Bill Clark photos



Adult Golden Eagle fitted with satellite transmitter

RESEARCH (CONTINUED)



Bill Clark photo

Adult Golden Eagle flies away with satellite transmitter

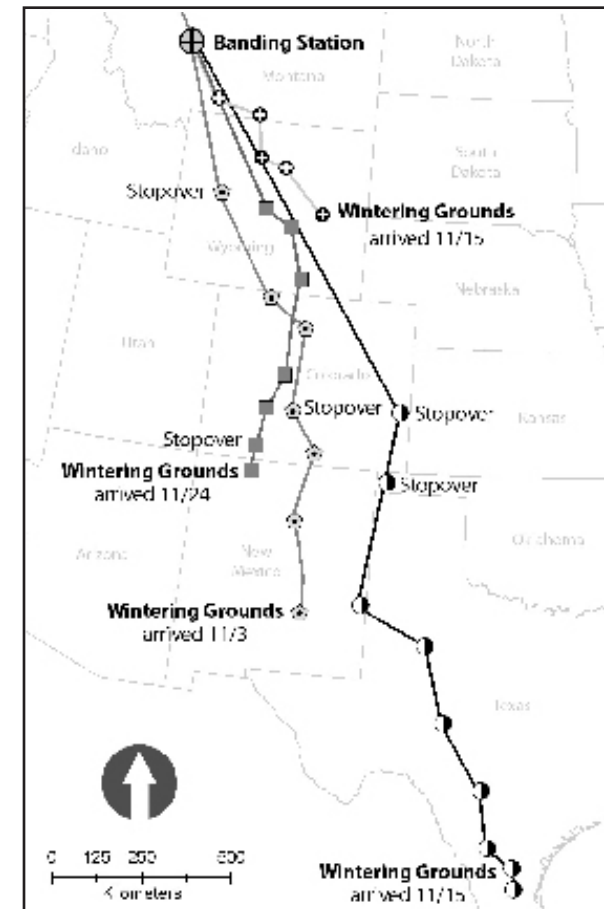
Threats to migrating eagles in the form of power line electrocution, poisoning, shooting, lead contamination due to fragmented rifle bullets in carrion and gut piles, vehicle collisions, habitat degradation and others have been ongoing for many years. In addition, wintering ground destinations such as those in Wyoming, Colorado, New Mexico and Texas have been subject to rapid and severe impacts from the oil and gas development boom of the last decade (Take a look at Google Earth satellite photos of these areas). Furthermore, largescale wind farm developments are also a concern, especially when located along migration routes and wintering areas. Indeed, threats to Golden Eagles have clearly increased and may have reached the point where reproduction is unable to keep up with increasing mortality.

RVRI will be reaching out to these industries, so that our satellite tracking data can be used in the planning process and placement of such facilities.

To help us learn more, Wildlife Computers donated two satellite transmitters specifically designed for our Adult Golden Eagle Satellite Tracking Project. Bryan Bedrosian of Craighead-Beringia South set this collaboration in motion, by discussing the importance of this work with Doug Bonham (Production Engineer) for Wildlife Computers. We are excited about this new collaboration.

Bryan expertly headed-up the instrumentation of all three eagles this season. This effort brings our total number to four, with one still transmitting from 2007. This technology allows us to track the daily movements of our eagles, during migration, and while on wintering grounds. Once back on summer range, we cut the tracking back to a few days a week, until September, when we start all over again. Please see map for fall migration routes to wintering grounds. (See our website for periodic updates and maps)

There is a need to learn more about Golden Eagle migratory ecology in North America. Where do they winter and how long do they stay? Do they use the same migration routes and wintering areas annually? What threats do they face, both human related and naturally occurring? These are just some of the questions that we need to answer in order to determine appropriate conservation and management strategies for this "species of concern."



Migration routes of GE's with satellite transmitters



GOLDEN EAGLE RESEARCH PROJECTS 2008 • • • •

Determining Gender in Golden Eagles

Morphological measurements such as wing-length, length and body weight have proven to be reliable indicators in determining gender for several raptor species. In many raptors, females often are measurably larger than males. However, this is not always the case with Golden Eagles. By collecting DNA and comparing it to our morphological measurements, we hope to identify the most accurate technique for sexing Golden Eagles in hand.

Bill Clark photo



Rob and Bryan displaying the impressive wings of the adult Golden Eagle

Foot Volume

David Ellis is arguably the leading authority on Golden Eagle Ecology and Natural History in the world today. We were honored when David approached us to see if we could put to the test his innovative idea for sexing Golden Eagles. David's idea was simple: If you place an eagle's foot in a beaker of water, the female foot would displace measurably more water than the male foot. As you might imagine, gently immersing the foot of a wild Golden Eagle in a beaker of ice cold water is not the easiest procedure. RVRI staff developed a workable approach for the procedure, and we currently are awaiting the results of our research.

Tyler Veto photo



Carefully measuring foot volume on a Golden Eagle

Wing loading

Some diurnal raptors spend a considerable amount of time flying when hunting. Also, many migratory raptors cover great distances. Wing area and wing loading are important aerodynamic characteristics pertaining to agility, speed and soaring characteristics of flight.



Wing-loading can also influence hunting styles and migration behaviors. In general, to determine wing-loading, one utilizes wing area and bodymass measurements. Wing loading is known in many species of raptors, but not in Golden Eagles. This research will add insight into Golden Eagle aerodynamics and behavioral ecology.

Eagle Lead Project

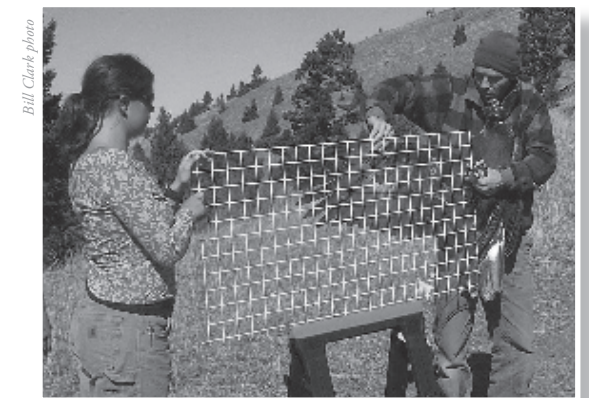
Lead poisoning in raptors, especially Bald Eagles, has been well documented. A ban on lead shot for waterfowl hunting was initiated in 1991 to remedy this issue. However, mounting evidence suggests that the problem persists and that the source of the contamination is gut piles, left behind by hunters.

Golden Eagles are opportunistic feeders, known to scavenge gut piles. To date we have lab analyzed blood from 44 Golden Eagles and found that 58% of our sampled eagles have elevated blood-lead levels. In fall 2008, we added another 32 eagles to our sample size (28 Golden and four Bald), bringing our total number of sampled eagles to 76. These samples are currently being analyzed for lead by University of Montana chemist, Heiko Langner. Preliminary data acquired using a portable lead test kit revealed elevated blood-lead levels in 14 of our 31 eagles.

Blood Pathogen Project

Our good friend and colleague Bryan Bedrosian with Craighead-Beringia South, a research organization based in Kelly, Wyoming, put us in contact with toxicologists Dr. Alan Slosberg, with Kimron Veterinary Institute, Israel, and Dr. Wilson Rumbelha, with the Diagnostic Center for Population and Animal Health, Michigan State University. These two authorities have developed a system whereby several dime-sized dried blood spots are analyzed for environmental toxins as well as bacterial, viral and organismic blood pathogens. We are excited about this recent collaboration and are anxious to see what may be discovered in our Golden Eagle blood.

*Please see the RVRI Web site, [www.raptorview.org], for updates on all these projects.



Bill Clark photo

Using a wing-board to determine wing area



Step Wilson photo

Determining tail surface area on hatch-year Golden Eagle



Bill Clark photo

Tail plumage varies amongst Golden Eagles



Bill Clark photo

A closer look at the dorsal side of Golden Eagle wings



RVRI RECAPTURES BANDED GOLDEN EAGLE

Recaptures, band returns and sightings of previously banded and marked birds are generally referred to as "encounters", by the Bird Banding Lab. Encounters give information that help researchers learn about the fate of the individual bird and possibly more about the species as a whole.

This fall we had a very exciting encounter: our first recaptured Golden Eagle! While annually we encounter Golden Eagles at a rate of roughly 10 percent (see wing-tag update section), until now, RVRI never has recaptured a Golden Eagle.

Golden Eagle No. 629-51808's extraordinary story testifies to the species' ability to survive under adverse circumstances. This eagle was first captured and banded by RVRI staff on Oct. 4, 2004, and was estimated to be a 3-year-old male. He was recaptured Oct 25, 2008. In 2004, staff noted that the eagle had pre-existing injuries, including a broken and displaced second toe on his left foot. Upon closer inspection in 2008, we found the bird had more injuries than originally observed. We believe these injuries likely were the result of an impact trauma event such as a vehicle collision. The injuries included a fractured beak, lacerated tongue and three broken toes on the left foot, rendering that foot useless for grasping.

Eagle showing old existing injuries, broken beak (left) and broken and displaced toes (bottom)



Under normal conditions, survival rates for younger eagles are estimated to be low, with roughly 50 percent of fledglings surviving their first year. Golden Eagle No. 629-51808 definitely beat the odds. As this bird was recaptured using road-killed deer, we surmise that his feeding technique helped him survive during his initial healing - although it also may have contributed to his accident in the first place. Golden Eagles are commonly observed feeding very close to the road on road-killed animals.

Although Golden Eagle No. 629-51808 is a success story in many ways, one unsettling note remains. Because this bird likely scavenges a lot, he probably seeks out gut piles, left behind by hunters. Evidence shows that gut piles often contain lead fragments. Upon running a blood test on this bird in the field, RVRI staff found he had very high blood-lead levels. Given these results, we can only hope this bird continues to beat the long odds and survive in an often unforgiving environment.



Rob releases Golden Eagle (bottom), Vince and Rob with recaptured eagle (upper left), band on recaptured eagle (upper right)



OSPREY RESEARCH 2008

Missoula is located along the Clark Fork River, just downstream from one of the largest Superfund sites in the country. For more than 100 years, heavy-metal contaminants from mining operations have accumulated behind the Milltown Dam. These contaminants include mercury, arsenic, lead cadmium, zinc and copper. The dam has been removed and we are continuing our study, now in its third year, to see how the ecosystem and the Osprey respond to this change.

As top predators that feed exclusively on fish, Ospreys serve as biological indicators, i.e. "canaries in the coal mine" of the health of the aquatic ecosystems. By testing Ospreys for contaminants and monitoring the health of local populations, we can gauge the level and extent of the contamination present in these ecosystems. RVRI's Osprey research project presents an ideal opportunity to establish baseline data for pre-and-post dam removal contaminant levels, as well as using Ospreys as "bio-sentinels" for other Montana watersheds.

We are proud to be partnering with several local experts, University of Montana researchers Dr. Heiko Langner and Dr. Johnny Moore (Environmental Biogeochemistry Lab) and Dr. Erick Greene (Division of Biological Sciences and Wildlife Biology), to closely examine the causes, locations and possible effects of mining-related contaminants on Ospreys and the ecosystems that support them.

During the 2008 field season we accessed 35 nests, testing and banding 40 nestlings. This brings our three-year project total to 44 nests and 77 nestlings. Results are troubling, with many of our nestlings showing mercury levels 100 times higher than what would be considered toxic in humans.



Erick Greene photo

Osprey Chick



Erick Greene photo

Amanda with baling twine pulled from Osprey nest



Erick Greene photo

End result of baling twine entanglement



(left) Pryun nest Osprey Chicks, (right) working on Osprey nest from boom truck



OSPREY BALING TWINE PROJECT

Ospreys have the habit of collecting unusual materials for their nests. We have discovered items such as: baseball caps, bungee chords, gloves, underwear, shirts, old rusty pieces of barbed wire, tattered pieces of blue tarp and of course lots of baling twine. Unfortunately, baling twine is a serious threat to Osprey. This polypropylene rope is used to tie bales of hay and it often gets left in fields after people open the bales to feed livestock. We have found baling twine in nearly every nest located in our study area. An Osprey nest that blew down in Missoula contained more than a quarter of a mile of baling twine!

This causes big problems for the Osprey chicks and even adults because they can easily get tangled in it. In some areas, it kills more than 10 percent of the chicks before they fledge. All too often the birds suffer a slow agonizing death, hanging upside down from the nest until they expire. Sometimes they are strangled or starved to death when very young. One fledgling in Helena was reported to have suffered an amputated foot.

This season we found one nestling badly tangled in this unforgiving line. Luckily, we got there in time to cut it free before permanent damage had occurred. Follow up nest visits showed the youngster made a full recovery.

Hellgate High School students Max Egenhoff and Matt Parker are working diligently to remedy this problem. Matt and Max are working closely with Dr. Erick Greene, Anicka Kratina-Hathaway and Amanda Ormsher (undergraduate biology students from The University of Montana). Their outreach includes an information pamphlet on baling twine and Osprey.

Matt and Max made quite an impression in local and regional science fairs, and won an all-expenses paid trip to the international high school science fair in Atlanta, Georgia. They presented a poster on landscape analysis of baling twine in Osprey nests.

Anicka, Matt, Max, Amanda and Dr. Erick Greene co-presented at the annual Raptor Research Foundation Conference. It was a unique "tag-team" effort, with each one presenting a specific piece of the project. We heard from many people that it was great to see younger students involved at this conference, and also that it was one of the best presentations at the conference.

Anicka also won the first prize for the best undergraduate biology presentation at the UM undergraduate research conference. She was also selected to represent UM at the National Undergraduate Research conference in Flagstaff, Arizona. She spoke on baling twine and mercury in Ospreys.

For more information, contact projectosprey@mso.umt.edu or visit our website at www.raptorview.org. Coming in Summer 2009, the "Osprey Cam." (see page 4)



RESEARCH (CONTINUED)



SWAINSON'S HAWK NESTING PROJECT

When we started the Swainson's Hawk (SWHA) project in 2006, we located 10 active breeding territories on the grassland ecosystem of Missoula Valley, which spans roughly from Reserve Street west to Frenchtown. To date, we have banded 30 individuals and marked 21 with uniquely color-coded leg bands. These colored bands allow us to identify, re-sight and track individuals from a safe distance, while learning more about breeding behavior, territoriality, nest site fidelity and survivorship.



Swainson's Hawk

In 2007 and 2008, we found that the number of active breeding territories declined to only seven and six confirmed breeding territories respectively. During this time, reproduction has been very low as well, with numerous failed nest attempts. Although, drought and reported low vole numbers are likely having an effect on reproductive success; we view subdivision sprawl and related development as the main factor driving this decline. In a few short years we have literally watched several nesting locations and hunting areas transformed into housing, roads, parking lots and storage facilities.

In Montana SWHAs are a "species of special concern". As a grassland specific species, they are dependent on open prairie-like landscape to survive. Unfortunately, it is this specific grassland habitat, required by SWHAs and other prairie dependent species that is being threatened through widespread development of the Missoula Valley grasslands.

Recently, the Five Valleys Audubon Society chapter became aware our SWHA project and sought our input on some recent subdivisions and the possible impact of breeding SWHAs. We are now working with them and sharing our data, to reach out to developers, land owners and others. Our goal is to conserve some of this critical, remnant prairie-grassland habitat. Proper land conservation and management strategies will play an important role if we are to maintain our local breeding population of SWHA, as well as other Missoula Valley prairie dependent species.



Nestful of Swainson's Hawk chicks in the grasslands of the Missoula Valley

RAPTORVIEW RESEARCH T-SHIRTS NOW AVAILABLE!

RVRI now has 100% organic cotton T-shirts available for purchase. We have 2 styles to choose from. They cost \$20.00 per shirt, shipping and handling included. Make your check payable to Raptor View Research Institute and specify type, size and number. You can also e-mail us at rob.domenech@raptorview.org and subject your message "T-shirt".



**T- Shirt Design #1
Front**



**T- Shirt Design #2
Back**

PARTNERSHIPS & COLLABORATIONS 2008

RVRI continues to develop partnerships and collaborations with other professionals in order to build on our research and expand our educational outreach. It is impossible to express how crucial these relationships are to our work. They develop out of a common interest and passion for raptors, their health and environment. And as often happens, professional relationships turn into lifelong friendships.

We would like to take this opportunity to recognize some of these individuals and organizations:

Our sincerest thanks and appreciation go to Bryan Bedrosian with Craighead-Beringia South; David Ellis; Dr. Alan Shlosberg; Denver Holt with Owl Research Institute; Erick Greene and Heiko Langner with University of Montana; Jim Lish with Oklahoma State University; Kate Davis with Raptors of the Rockies; Ken Wolff of Grounded Eagle Foundation; Melanie Smith, Geographic Information System specialist; Pete Sherrington with Rocky Mountain Eagle Research Foundation; Ryan, Alter of Alter Enterprises; Steve Hoffman, Montana Audubon; Jim Sparks, Bureau of Land Management; Steve Kloetzel, The Nature Conservancy; Pat Shanely, Helena National Forest and Wildlife Computers.

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2008: A VIEW FROM THE FIELD



Tyler Veto photo



Gavin and Colton with Red-tailed Hawk

Step Wilson photo



Step Wilson on the Rocky Mountain Front

Tyler Veto photo



Jim Lish appears to be attacked by recently released Golden Eagle

Tyler Veto photo



White epaulettes on a Golden Eagle, a rare occurrence

Tyler Veto photo



Bryan Bedrosian releasing Golden Eagle

Bill Clark photo



Vince Slabe with Cooper's Hawk

Step Wilson photo



Rob with Golden Eagle

Etta Htu photo



Examining molt pattern on adult Golden Eagle

THANK YOU!



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Craighead-Beringia South
Fanwood Foundation
Fledgling Fund
Grounded Eagle Foundation
Helena National Forest
International Osprey Foundation

Koret Foundation
LCAO Foundation
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Raptors of the Rockies
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Walker Family Trust
Wildlife Computers
Yellowstone to Yukon

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Missoula Veterinary Clinic
Montana Ace Hardware
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