

AZ-NM JAGUAR CONSERVATION TEAM

JAGUAR CAPTURE GUIDELINES

Revised: May 2007

The capture and immobilization procedure outlined in this document is intended for experienced houndsmen, field biologists, and veterinarians working in close association with the Jaguar Conservation Team. It is imperative that all assembled capture team members consider the safety of humans, hounds, and the jaguar(s) above all else before, during, and after any jaguar immobilizations.

It is the intent of the Jaguar Capture Team to follow the recommended capture and immobilization guidelines provided by the Wildlife Conservation Society (WCS) Jaguar Conservation Program (www.savethejaguar.com). The WCS guidelines were developed by veterinarians with the WCS Field Veterinary Program to provide a standardized and safe, ethical approach to capture, handling, and sampling protocols throughout the jaguar's range.

Methods that have been used successfully in the capture of free-ranging jaguars include treeing the animal using dogs, padded foot-hold traps, snares, and cage or box traps. The later of these methods may or may not include luring the animal to the trap with bait(s).

STEP 1. RISK ASSESSMENT

The Jaguar Conservation Team will assemble a *Risk Assessment Team* prior to any capture attempt to determine the appropriate and most feasible method of capture on a case-by-case basis. The Risk Assessment Team will consider the following: 1) safety of capture participants, hounds, and the jaguar; 2) proximity of the capture location to Mexico; 3) availability of personnel; 4) availability of equipment; and 5) logistics of deployment (i.e. appropriate permits are in place, use and location of a base camps, etc.). *See Risk Assessment Team recommendations dated Feb. 28, 2005.*

Appropriate Permits: A current permit from the U.S. Fish and Wildlife Service is needed for the capture of jaguars, including take provisions for capture related mortality. The permit should be sufficient to account for liability of capture participants in case of injury or death to humans or the jaguar. Required permit(s) issued by the U.S. Fish and Wildlife Service will be written in such a manner that live-capture of a jaguar(s) is legal in Arizona and New Mexico, provided that capture attempt, handling and attachment of radio-telemetry, and subsequent monitoring are performed as outlined in the Jaguar Conservation Agreement.

The Arizona Game and Fish Department has obtained a USFWS permit for the capture of a jaguar. The Permit currently coincides with AGFD Nongame and Endangered Wildlife Program project narratives and work plans.

In New Mexico, required state permits from the New Mexico Department of Game and Fish will be issued to appropriate members of the Jaguar Conservation Team provided that capture attempt, handling and attachment of radio-telemetry, and subsequent monitoring are performed

as outlined in the Jaguar Conservation Agreement and as approved by the U.S. Fish and Wildlife Service.

STEP 2. ASSEMBLY AND IMPLEMENTATION OF THE CAPTURE TEAM

In accordance with the recommendations of the Jaguar Conservation Team Research Committee the capture team will, at a minimum, consist of: a lead biologist *with recent experience immobilizing and handling wild jaguars*; a licensed veterinarian *with recent experience working with large felids*; an assistant for the veterinarian and the biologist *with recent capture experience and a biological background*; a professional agency houndsman; and a houndsman's assistant *with knowledge of the local terrain and dog handling procedures*.

The Arizona Game and Fish Department or the New Mexico Department of Game and Fish will be considered the lead agency for any captures initiated in their respective states. The state agency will be responsible for assembling the Capture Team, including contacting the U.S. Fish and Wildlife Service prior to any capture attempt occurring in either state. Personnel currently responsible for jaguar related issues and their respective contact information is as follows:

Arizona Game and Fish Department

Main Office: 2221 W. Greenway Rd, Phoenix, AZ 85203
602-942-3000
623-236-7201 Radio Room
800-352-0700 24 Hours a Day / 7 Days a Week

Bill Van Pelt 623-236-7573; Eve. Phone: 602-889-0710
Terry Johnson 623-236-7707

Region V 555 N. Greasewood, Tucson, AZ 85745
520- 628-5376

Tim Snow 520-388-4449; Eve. Phone: 520-519-0163
Robert Fink 520-388-4441

Unit Managers Region V – 602-789-3201 Radio Room or 800-352-0700

30A	Alicia Jontz
30B	Brad Fulk
34	Vacant
35	Vacant
36A	Vacant
36B & C	Vacant

New Mexico Department of Game & Fish

Main Office: P.O. Box 25112, Santa Fe, NM 87504
505-827-7882; 505-827-9904; 505-827-7899
505-827-9376 Radio Dispatch

Nick Smith 505-773-4845; Cellular Phone: 505-838-6421; P.O. Box
101, Quemado, NM 87829
Chuck Hayes 505-476-8101; Eve. Phone: 505-896-4291
Tod Stevenson 505-476-8101; Eve. Phone: 505-424-7544
Kerry Mower 505-476-8080; Eve. Phone: 505-470-3819

Southwest Area Office: 566 N. Telshore Boulevard, Las Cruces, NM 88011
505-522-9796

Pat Mathis 505-546-9784; Cellular Phone: 505-544-1946; 10095
Trocadero Road SE, Deming, NM 88030
Leon Redman 505-388-0770; 505-388-0231; Cellular Phone: 505-538-
0233; P.O. Box 1421, Silver City, NM 88062

US Fish and Wildlife Service

Nancy Kaufman
Steve Spangle 602-640-2720
Bill Radke 520-364-2104; Eve. Phone: 520-378-3778
Matt Magoffin 520-558-2471
Sarah Rinkovich 505-248-6663

Experienced trappers, dart gunners, houndsmen, and veterinarians include:

U.S. Department of Agriculture - Wildlife Services

Arizona

David Bergman 602-870-2081; 8836 N 23rd Ave Suite 2, Phoenix AZ 85021
Timothy Veenendaal 602-870-2081; 8836 N 23rd Ave Suite 2, Phoenix AZ 85201
Sam Dieringer 602-870-2081; 8836 N 23rd Ave Suite 2, Phoenix AZ 85201
Has hounds and mules; qualified darter
J.R. Murdock 602-870-2081; 8836 N 23rd Ave Suite 2, Phoenix AZ 85201
Has hounds and mules; qualified darter

New Mexico

Alan May 505-527-6980; 505 S. Main Suite 401, Las Cruces, NM 88001
Brandon Jones 505-538-0318; 2503 Hwy 90, Silver City, NM 88061

Hunters With Hounds and Mules: Houndsman will be furnished by USDA Wildlife Services
Arizona or New Mexico.

The following hunters have had limited experience with bayed jaguars and may be used as
assistants to the houndsman if necessary.

Warner Glenn 520-558-2470, PO Drawer 1039 Douglas AZ. 85608
Jack Childs 520-398-8110, 1165 W. Hawk Way, Amado AZ. 85645
520-975-6794 Cell
Matt Colvin 520-682-0031, 5845 Blazing Star Dr. Tucson AZ. 85743

520-744-1000, Ext.456 Daytime Phone
520-490-2946 Cell

Qualified Dart Persons

AGFD

Robert Fink	Region V: 555 N. Greasewood, Tucson, AZ 85745
Brad Fulk	Region V
Gabriel Paz	Region V
Jim Heffelfinger	Region V

NMDGF

Pat Mathis	505-546-9784; Cellular Phone: 505-544-1946; 10095 Trocadero Road SE, Deming, NM 88030
Nick Smith	505-773-4845; Cellular Phone: 505-838-6421; P.O. Box 101, Quemado, NM 87829
Kerry Mower	505-476-8080; Eve. Phone: 505-470-3819

Qualified Veterinarian

AGFD

David Edsall	Adobe Mountain 520-748-0331; 4984 E. 22 nd St., Tucson, AZ 520-623-3116 Eve. Phone; Cell: 520-444-8071
Kris Bell	520-537-2880; 100 S. Clark, Show Low, AZ 8590 520-532-7036 Eve. Phone; 520-537-3288 Fax
Peter (Ole) Alcumbrac	520-368- 8425; 1939 W. White Mt. Blvd., Lakeside, AZ 85929; 520-532-0062 Eve. Phone; 520-368-8427 Fax

We need to add sections for the other members of the capture team. We need the lead biologist, and the assistants for the biologist and the houndsman.

CONTACT ORDER AND RESPONSIBILITIES

The contact order may vary depending on the geographical location of the capture attempt. The respective state agency where the capture will occur will be responsible for contacting the necessary field personnel and veterinarian.

Arizona:

1. Bill Van Pelt
or
Terry Johnson Notifies U.S. Fish & Wildlife Service (USFWS) of capture attempt. Transports USFWS representative and veterinarian, if necessary. Will obtain and carry, in hand, a copy of the USFWS permit allowing the capture to take place.
2. Tim Snow
or
Robert Fink Has possession of radio tracking equipment. Coordinates capture attempt, including contacting appropriate field personnel (i.e. qualified dart person, houndsmen, trapper, veterinarian). Transports veterinarian if necessary. Notifies appropriate land management agency of capture attempt. Also notifies, anyone

holding a use permit on public lands or owning private lands in the immediate vicinity that the capture attempt is taking place.

New Mexico:

1. Chuck Hayes
or
Pat Mathis Notifies USFWS of capture attempt. Transports USFWS representative and veterinarian as necessary. Will obtain and carry, in hand, a copy of the USFWS permit allowing the capture to take place.
2. Pat Mathis,
Nick Smith, or
Kerry Mower Has possession of radio-tracking equipment. Coordinates capture attempt, including contacting appropriate field personnel (i.e. qualified dart person, houndsmen, trapper and veterinarian. Transports veterinarian if necessary. Notifies appropriate land management agency of capture attempt. Also notifies, anyone holding a use permit on public lands or owning private lands in the immediate vicinity that the capture attempt is taking place.

STEP 3. CAPTURE

Again, it is imperative that the Capture Team considers the safety of humans, the jaguar, and the hounds (if used) above all else before, during, and after any jaguar capture and immobilization attempt. It may be necessary to discontinue the capture effort if, at any time, the situation is assessed to be too risky to the jaguar or the capture team.

It is not the intent of these guidelines to document the logistics of each capture method. However, there are a number of specific considerations that the Capture Team should be aware of for each method.

Padded foot-hold traps, snares, and cage or box traps. It is imperative that should any of these methods be used that strict monitoring protocols be followed. The traps or snares should be monitored in a manner that minimizes the amount of time an animal might be ensnared while maintaining the effectiveness of the trap. Current technologies, including electronic monitoring, should be considered when choosing any of these methods. None of these capture attempts will be used without having the appropriate immobilization personnel (qualified biologist and veterinarian) in place.

Use of dogs to tree an animal. When using dogs to chase and track a jaguar, it will be necessary to follow the instructions of the dog handler so as not to interfere with the hounds. The handler will attempt to stay as close to the hounds as is practical and shall have in hand a 2-way radio in order to maintain contact with the rest of the capture team.

Once a jaguar is bayed or treed, all personnel except the dart shooter, the dog handler, and the veterinarian will move back. Hounds will be leashed and tied or held in an area within sight of the jaguar. Hounds will be removed from the capture area after any immobilization has taken effect.

It is important to keep in mind that jaguars are likely to be more aggressive than mountain lions when cornered or treed and are more likely to come to bay on the ground than are mountain lions. Wild animals react differently when an antagonist enters their safety zone. The first instinct is to flee. If that is not possible, some animals will attack in order to defend their space. Jaguars are more likely to resort to the attack mode than are mountain lions. The distance an animal will allow you to approach without triggering the flight or charge instinct is different with each individual. The Capture Team and mainly the pursuit team (i.e. trapper or houndsman) should assess this distance by watching the body language of the bayed or treed animal and make every effort to stay outside of the animal's area of tolerance, but not so far away as to allow the animal to flee. Also keep in mind, the closer a houndsman gets to the jaguar, the bolder his hounds will tend to be, and the greater the chance that the jaguar will attack and possibly injure or kill hounds. Bolder and more aggressive lion hounds should be left out of the pack.

In the event that the jaguar leaves the area after it has been darted, 15 minutes will be allowed for the anesthetic to take affect. At this time, the dog handler will take one or two hounds on a leash and trail the cat. If the cat is in a dangerous situation, such as a bluff or is high in the tree where injury from a fall is likely, the cat will be chased from the area before the drug takes full affect. If that is not possible, the cat will be assisted out of the tree when the drug has partially taken affect and the veterinarian decides it is safe to do so. If necessary, a tarp will be used to catch the animal if it falls. It may be necessary to call off the capture if the situation is assessed to be too risky to the jaguar or the capture team.

STEP 4. IMMOBILIZATION

It is important to remember that person(s) who immobilizes any animal, including a jaguar, becomes solely responsible for the health of that animal from the time the drug is administered until the animal has fully recovered from the anesthetic. It is imperative that anyone engaged in the immobilization of free-ranging jaguars know how to handle the anesthetized cat, monitor physiological parameters, and respond to medical emergencies should they arise.

Once a jaguar has been snared, trapped, or bayed, the jaguar will be anesthetized using the appropriate remote drug delivery system (i.e. pole syringe for caged animals; dart rifle or pistol for treed, bayed, trapped, or snared animals). Administration of any drugs will be performed under the strict guidance of a qualified dart person and the veterinarian. The person(s) administering the drug will maintain visual contact until the anesthesia has taken effect. Note: The cat should be anesthetized as quickly as possible to reduce the risk of injury to the cat, the hounds and the capture team. The drug of choice will be Telazol at a dose of $\pm 5\text{mg/kg}$ (2.3 mg/lb.) as recommended by the Wildlife Conservation Society (WCS) Jaguar Conservation Program. For treed animals, the recommended drug is ketamine (dose of 7mg/kg) for initial immobilization, followed by xylazine (0.7 mg/kg) intramuscular once the animal is on the ground. The darter and veterinarian will estimate weight of the jaguar and calculate proper dosage of the drug(s).

Once the jaguar is anesthetized, all hounds will be removed from the site and tethered safely out of sight from the jaguar. The person(s) handling the jaguar will wear latex gloves to avoid transmission of infectious diseases between the jaguar and his/herself, as well as minimize

contact with any drug residues that may reside at the injection site. The jaguar will be moved to a shaded location and placed in lateral recumbency (lying on its side) with head and neck placed in a position that allows air to flow through the mouth and trachea (windpipe). Care will be given to cover and apply ophthalmic ointment to protect the jaguar's eyes and topical agents may be applied to the dart site.

The veterinarian will conduct physiological monitoring including respiratory rate, heart rate, and temperature [normal temperature is 37-39.5° C (98.6-103.1° F), respiratory rate of 8-24 breaths/minute, and heart rate of 70-140 beats/minute]. In addition, the veterinarian will take blood samples for genetics and disease analysis; treat dart wound site; assess physical parameters such as gums, eyes, coat condition; and obtain fecal and urine samples as possible. To maintain an adequate level of anesthesia, supplemental ketamine at a dose of 1-1.5 mg/kg may be used as needed (No ketamine should be delivered for at least 10 minutes after the telazol dart.) Atropine at a single dose of 0.04 mg/kg either subcutaneous or intramuscular may also be administered if excessive salivation occurs. The veterinarian will determine the need and application of all supplemental anesthetics.

Simultaneously the lead biologist and assistant will affix the radio collar on the jaguar and collect tissue and mid-dorsal hair samples. Dried blood and tissue can be scraped from under the claws to determine the prey species of the jaguar's previous meal through DNA analysis. Photographs should be taken of the head, teeth and gums, bottoms of feet (close up), and full body (left and right profile). A close up photograph of the end of the tail should be taken to show the pattern of the black and white rings and spots. Any unusual or distinguishing features should also be photographed.

Other information to be gathered includes the sex of animal; length of body and tail; chest girth; height at shoulder and hip; skull length, width, and girth; weight; and estimated age of cat. The canine tooth length and bite width should be measured to help determine age. Measurements of the length and width of front and rear feet and heel pads will be taken.

Once the collar is in place and all data has been collected, the veterinarian will determine if the jaguar is stable enough for release. In addition, the veterinarian will determine the need and application of any necessary recovery drugs. All personnel will leave the area, with a spotter watching from a distance until the cat is able to leave the area.

In the unlikely event of a capture-related mortality, the veterinarian will document the reasons leading to the cause of death and list the first aid procedures used attempting to resuscitate the animal. Necropsy procedures can be performed at this time if deemed necessary by the veterinarian. The carcass will be turned over to the USFWS.

STEP 5. MONITORING

Funding: A commitment of funds and equipment for monitoring the jaguar's movements and activities must be made prior to the animal being collared.

Monitoring activities will adhere to the methodology detailed in the report *Research Recommendations for the Jaguar Conservation Team*, approved by the Team at the April 2006 meeting. A commitment of fund for all equipment, personnel and operating costs outlined in this report and budget must be in place prior to any capture attempt.

Responsible Agencies: The Arizona Game and Fish Department will monitor the jaguar within the state of Arizona. To the degree feasible, the New Mexico Department of Game and Fish will monitor radio-collared jaguars within the state of New Mexico. Qualified members of the Jaguar Conservation Team are authorized to monitor jaguars in New Mexico in accordance with the objectives of the Jaguar Conservation Agreement. Efforts will be made to maintain the confidentiality, including hacking and misuse of telemetry information, of individual jaguars.

Methodology: Detailed methodology is outlined in the *Research Recommendations for the Jaguar Conservation Team*. Satellite telemetry will maximize the quality and quantity of information gathered regardless of land management status or international boundaries. Ground and/or aerial telemetry will supplement satellite telemetry when possible to investigate localized activity or possible feeding sites.

The Jaguar Conservation Team will contact the appropriate Mexican Governmental agency to coordinate monitoring efforts back and forth across the border. Dr. Carlos Lopez Gonzales has volunteered to contact appropriate Mexican Government officials and assist in coordinating monitoring efforts within Mexico. Carlos can be reached at 303-376-4982 or by e-mail at cats4mex@aol.com.

1. The jaguar will be monitored after release from a distance sufficient to avoid detection of the observer by the jaguar, while allowing the observer to monitor the cat's physical recovery from the drugs.
2. The jaguar will be monitored daily for 3 consecutive days to ensure no immediate negative effects (capture myopathy, etc.) occur as a result of the capture. Ideally, monitoring should take place daily for as long as possible. However, monitoring shall be done in such a manner so as not to interfere with the animal's normal habits and movements. Also, monitoring should take place in such a manner so as not to alert the general public to the location of the jaguar.
3. The jaguar will be monitored weekly for one month and then bi-weekly until the end of collar life. Aerial and satellite telemetry may be used as necessary. The GPS collar recommended in the *Research Recommendations for the Jaguar Conservation Team* as most appropriate to achieve study objectives is the Telonics Gen III GPS collar with ARGOS satellite uplink. These collars record GPS locations (Universal Transverse Mercator, UTM) at predetermined times and then send the most recent six locations through an ARGOS satellite uplink directly to the research team. The uplink data transfer is also programmable, and can be scheduled to transmit at random times to avoid hacker interception of data. Any locations that are not transmitted in the scheduled uplinks will be stored onboard the collar and can be recovered when the collar is removed. We recommend several locations be recorded during both day

and night to document day-beds as well as travel/hunting areas and feeding/predation sites respectively.

The current knowledge of activity patterns for the jaguars in arid environments is limited, but suggests most movements are made at night and that jaguars rarely move during daylight hours (McCain and Childs 2006 prelim. data; n=46). For the purposes of determining detailed habitat utilization, we recommend scheduling four locations a day at 000, 400, 1200, and 2000. This sampling regime will allow three locations each night over an eight-hour period. This will sample when jaguars are most likely moving, pursuing prey or feeding with one location at midday when jaguars are most likely resting to document day-beds.

4. Additional monitoring will occur as resources allow, including visits to areas frequented by the jaguar and possible prey use investigations.
5. Monitoring information will be made available to Jaguar Conservation Team members, the media, and the general public as necessary to evaluate progress of Team objectives. Information that could potentially cause undue harm to the jaguar (specific locations, movement patterns, etc.) will remain confidential.

CAPTURE KIT

The following materials will be available in kit-form, which will easily fit into a backpack or saddlebag. The capture kit will be stored at the Arizona Game and Fish Department Region V Office in Tucson. Additional kits may be kept available at other locations, as necessary.

Backpack	Jab stick
Collar with extra collar material	Empty film containers (for samples)
Collar wrench	Blindfold
Telazol - 4 bottles	Filled water bottle
Ketamine - 4 bottles	Xylazine – 4 bottles
Syringes	Rubber gloves
Sterile water	Forceps
Darts - 4 each (3cc, 2cc, 1cc)	Ziplock bags
Dart gun	Flashlight
Chapstick	Batteries
Duct tape	Plastic tarp (10X10)
Hole punch	30 foot nylon rope and portable scale
Calipers	Tape measure
DNA tissue collecting kit	Disposable camera
*5 Hand-held 2-way radios	Digital camera
Rubbing Alcohol - 4 bottles	12 X 12 Tarp
100 ft climbing rope	Climbing harness
Climbing webbing	Extra tie cord/rope

* To ensure battery life, radios will be added to kits prior to use

VETERINARIAN SUPPLY LIST

The following is a list of items recommended for inclusion in a “Vet Bag.” Additional items were included in a kit the last time a capture was attempted, and might be necessary. The veterinarian may modify or add to this list as needed. These materials must be carried in a backpack or saddlebag, so time and distance should be considered.

Blood tubes (sst, rt, lt)	Syringes
Swabs and tubes	Parasite tubes
Water (in a spray bottle)	Tubes for feces and urine
Antibiotics (such as triple antibiotic ointment)	Eye wash / wetting gel
Surgical pack containing sutures and needles	Intebation tubes
Breathing bag	Betadine
Neosporin or similar topical ointment	Cotton balls
Gauze	Medical/Athletic tape
Rubber gloves	Ketamine
Xylazine	Atropine
Epinephrine	Dopram
Dexamethasone	Soludelta cortef
Ivomec	

Some items on this list will be included in the veterinarian’s personal travel kit. Other items can be kept on hand in the offices of the respective State game and fish departments, as determined by the appropriate game and fish personnel.