National Park Service
U.S. Department of the Interior

Fire and Aviation Management

National Park Service

Aerial Capture, Eradication, and Tagging of Animals (ACETA) Operations Plan 2025

Foreword

The policies and procedures contained in this *NPS ACETA Operations Plan*, issued as a supplement to *351 DM 2.3A* and DOI ACETA Handbook, have been established to provide NPS personnel guidance in the planning, procurement, and utilization of aircraft and services while maximizing safety and enhancing efficiency**.**

Reference Manual 60, Aviation Management (RM 60) is the NPS policy that authorizes this ACETA Operations Plan.

The objectives, policies, and procedures prescribed herein are generally broad in scope and define minimum program or project standards. It is the responsibility of each NPS program or project to determine, within the parameters of this document, additional requirements necessary for safe and efficient operations. These requirements must identify and define specific (and often unique) needs; these are outlined in the project's ACETA Project Aviation Safety Plan (PASP).

NPS ACETA operations include a wide range, but a limited number, of park units which utilize NPS personnel to accomplish the mission. To be authorized as an ACETA program, park units must have an Aviation Enhancement Application (RM-60 Appendix 6) approved by the National Aviation Manager, Division Chief of Fire and Aviation Management and by the NPS Director. An ACETA program uses ACETA annually on a regularly reoccurring basis (high frequency). Some park units may request approval to use ACETA on a one-time, non-recurring project basis, which must be reviewed and approved by the RAM.

ACETA operations are inherently high risk to aircraft and personnel; aircraft are routinely maneuvered close to the ground, in all types of terrain, and in close proximity to vegetation, vertical terrain, wires and manmade hazards. During ACETA operations pilots are required to function in a highly focused manner with little margin for error. In addition, these missions require close coordination between the pilot and other crew members to accomplish the task and to maintain safety. In order to make ACETA missions safe and efficient, NPS and vendor personnel must have the knowledge, skills, training, and experience to function in this high-risk environment.

NPS personnel will familiarize themselves with the examples and definitions found in the appendices at the end of this Operational Plan. The NPS uses subject matter experts and/or training specialists for enhanced training either through manufacturer-certified trainers and/or NPS-approved trainers.

KRISTIN SWOBODA

Digitally signed by KRISTIN SWOBODA
Date: 2025.06.27 15:09:30 -06'00'

Kristin Swoboda

Branch Chief
National Park Service Aviation Program

Table of Contents

1 General Information

1.1 Purpose

This NPS ACETA Operations Plan outlines policies, procedures, qualifications, and equipment for aerial capture, eradication, and tagging of animals (ACETA) as a supplement to 351 DM2.3A, OPM-33 and the DOI ACETA Handbook. ACETA has been identified as a unique high-risk special use activity that requires specialized training and qualifications. Conducting an ACETA operation in a national park involves many facets of resource management and planning. Training, qualifications, and equipment for the aviation components will be covered in this Operations Plan; however, other aspects must be considered in a comprehensive plan (Fig. 1). ACETA operations should only be considered after all non-aviation options have been explored. Some of the following activities are not considered ACETA but may be used in conjunction with ACETA: hazing, herding, and radio telemetry.

Figure 1 Illustration of many of the components of a wildlife capture program. Only the aerial aspects will be covered in this plan; however, additional training, coordination, and qualifications are needed for other components.

It is the responsibility of each NPS-approved ACETA program/project to ensure ACETA training, project planning, wildlife capture, handling standards, firearms safety training and qualifications, and standards for immobilization drug training are provided to personnel that participate in ACETA operations.

This Operations Plan does not address issues associated with the training of personnel in the handling of wildlife (Institutional Animal Care and Use Committee (IACUC) - Biological Resources Division (U.S. National Park Service) (nps.gov), use of pharmaceuticals for wildlife (DO #77-4), or firearm qualifications. The Biological Resources Division, part of the NPS Natural Resource Stewardship and Science Directorate, should be consulted for questions regarding wildlife field anesthesia.

This NPS ACETA Operations Plan pertains to all NPS ACETA operations conducted with aircraft and aircrew procured through the Office of Aviation Services (OAS) and managed under DOI and NPS aviation policy, as well as other bureau personnel and cooperators that may be involved in NPS ACETA operations.

For operations utilizing the On Call ACETA helicopter contract, when the vendor provides all services, refer to the Master On-Call ACETA contract found on the DOI Acquisition Services - Contracts & Agreements web page found on the OAS website.

A. Departmental and NPS Policy

All aircraft operations will be conducted within DOI and NPS aviation requirements and policy. Operational control of the project must be established prior to any flight operations. The pilot-in-

command has full and final authority over operation of the aircraft. No one shall pressure the pilot into performing operations beyond the capabilities of either the aircraft or pilot. Any personnel in ACETA operations have the obligation and duty to prevent or terminate flight operations that they feel are unsafe, overly hazardous, or not in compliance with DOI/NPS policy.

B. ACETA Operations

ACETA operations may be conducted in NPS units in several ways:

1. NPS Operational Control: these missions are conducted and led by NPS personnel and aviation operations are under NPS control.
2. End Product Contracting: NPS personnel can contract for a certain number of animals to be captured, collared, eradicated, etc. In these instances, the contract specifies the end product (in terms of animals collared, eradicated, etc.) and there is not NPS operational control of any aviation component of the work.
3. Collaborator/Cooperator: Non-NPS personnel, such as state agencies, may conduct ACETA work in park units when approved by appropriate park permits. If NPS personnel are involved in any operation, DOI and NPS aviation policy and this operation plan will be followed. NPS park units must initiate a written agreement with cooperators performing ACETA missions.

C. NPS Operations

Only trained and approved NPS personnel may participate in NPS ACETA operations. NPS personnel must be qualified for the specific type of operations to be performed (i.e., darting, net gun, mugging, Single Skid, Toe-In and Hover Exit/Entry Procedures (STEP) operations, etc.). Personnel will primarily be qualified in an NPS-approved ACETA training course, but the RAM may approve qualified personnel based on previous experience or non-NPS training.

D. Firearm/Capture Device Safety

All ACETA gunners employing a firearm or capture device must be certified per the standards set by their park unit, program chief, chief ranger, and/or senior law enforcement officer.

All ACETA projects/programs must have approved equipment per the standards found in this Operations Plan. It is important that ACETA personnel are trained in proper use, care, and inspection of this equipment. All firearms/capture devices will be maintained, cleaned, and operating properly. Other than simple field repairs/maintenance per manufacturer's recommendations, all firearm/capture device repairs and modifications must be made by a certified gunsmith, manufacturer's certified personnel, or following manufacturer guidelines.

All gunners are responsible to adhere to all federal, state, and local laws that apply to the firearm/capture device. This may include proper transport, security, and packaging of the device.

For environmental contamination considerations, only non-lead ammunition should be used. If safety is compromised due to possible ricochet based on terrain, aircraft type, or other factors, lead-based ammunition may be considered via approval by the park's regional director.

1.2 Approval

ACETA programs and projects must be approved at the appropriate level.

A. New ACETA Program Requests

Requests shall be forwarded to and approved by the NPS Director or their delegate, per Reference Manual 60, Aviation Management (RM-60). Requests shall include a copy of the NPS Enhancement Application and the proposed local ACETA operations plan, signed by the RAM, describing when and how ACETA will be used. The operations plan must use a GAR or Go/No-Go process for risk management purposes**.** Plans must comply with agency and departmental policies and guidelines. A copy of the NPS approval will be provided to the Director of OAS.

B. ACETA Projects (One time or Infrequent basis)

Park units should coordinate with their RAM. Avenues to accomplish ACETA projects include:

1. Use of the DOI On-Call ACETA contract with qualified NPS ACETA personnel on board. Parks with existing ACETA programs may be a good source of qualified personnel.
2. Procuring services through the DOI On Call ACETA contract, ordered with vendor-supplied personnel.
3. Use of an end product contract.

1.3 Revisions to the NPS ACETA Operations Plan

The NPS National Aviation Office will initiate a review of this Operations Plan every five (5) years or when applicable Federal Aviation Administration (FAA), DOI, or NPS aviation policies/regulations change, or when this plan no longer adequately meets the needs of the ACETA programs.

2 Aircraft and Pilot Approvals and Requirements

2.1 ACETA Aircraft Procurement

Requests for aircraft services must be in compliance with NPS policy at the local, regional, and national level. The contractor that is requested must be approved by OAS for the specific ACETA activity required for the project (e.g., netting, darting, eradication). Current On-Call ACETA contractor rates and information are available from the NPS RAM or via the OAS website that lists Acquisition Services-Aviation Resources.

2.2 Aircraft

A. Fixed-Wing

1. Approvals - Fixed wings associated with ACETA are primarily used for radio tracking, survey, flight following, spotter, and reconnaissance purposes. The aircraft may need to be approved for various missions (e.g., low-level operations, off-airport landings, and reconnaissance). These are ACETA mission support operations and do not require the airplane or airplane pilot to be carded for ACETA. If airplanes are to be used for technical ACETA operations (i.e., eradication from a fixed wing), additional approvals and procedures will need to be developed.

2. Equipment - Airplanes must be equipped with communication systems; FM radio, satellite telephone, or other means that are capable of establishing and maintaining contact with other aircraft, ground, or dispatch personnel at all times during ACETA operations.

B. Rotor-Wing

1. Approvals - Helicopters will meet all standards for equipment and performance required in the ACETA procurement document or DOI fleet aircraft standards. The aircraft will be inspected and approved by OAS for ACETA before the aircraft can be used in any ACETA operation. Not all make and models are compatible with ACETA operations.

2. Performance - Aircraft limitations shall be adhered to during all operations. Helicopters provided should meet the minimum performance found in OPM-33, ACETA Helicopter Performance.

3. Equipment -
   a. The helicopter must be equipped with one of the following intercom systems to allow hands-free communication by the gunner to the pilot and other ACETA personnel onboard:
      i. “Hot” microphone for the gunner with a manual on/off switch. (Periods of operation will be covered in pre-flight briefing).
      ii. Voice-activated intercom system.
      iii. Foot pedal push-to-talk (PTT) intercom system, mounted at the gunner’s position and able to be activated while in the gunner’s position.
   b. Aircraft must be equipped with communication systems; programmable FM radio, satellite telephone or other means that are capable of establishing and maintaining contact with other aircraft, ground or dispatch personnel at all times during ACETA operations.

c. Approved ACETA aircraft may at times require the installation of a sliding door, removable door, or door equipped with a shooting window.

4. Rapid Refueling

When identified in the project aviation safety plan (PASP), as provided in the On Call Contract, rapid refueling can be requested by the government representative:

a. To facilitate safety
b. To enhance performance
c. For operational considerations

2.3 Pilot Approvals and Requirements

The pilot is an essential part of any aviation mission and must be made an integral part of a team effort whose objective is flight safety and efficiency. The pilot is in command of the aircraft and has ultimate responsibility under the FAA and the DOI regulations for the safety of the aircraft and its occupants.

All pilots must pass a flight evaluation given by a qualified OAS pilot inspector in accordance with the Interagency Airplane and Helicopter Practical Test Standards and be approved for the specific special use involved prior to performing any operation. The helicopter pilot's card will be issued with the appropriate endorsement for the activity in which they are to participate. (see Table 2.1.)

A. Airplane Pilot

1. Participates in risk analysis and Go/No-Go decision prior to and during the ACETA mission.
2. Coordinates with other aircraft participating in the ACETA mission.
3. Understands ACETA techniques, and operational concerns.

B. Helicopter Pilot

1. Participates in risk analysis and Go/No-Go decision prior to and during the ACETA mission.
2. If necessary, prior to operation performs a live mock-up with gunner, mugger and spotter (as applicable).
3. If STEP is involved, performs a mock-up with applicable personnel per Chapter 5.
4. Coordinates with gunner in determining a "shoot" or "no shoot" situation.
5. Coordinates with other aircraft pilots participating in the ACETA mission.
6. Understands ACETA techniques and operational concerns.
7. Demonstrates ability to work with the ACETA personnel.
8. Pilots must receive firearm/capture devices and chemical immobilization briefing as appropriate to the mission.

2.4 ACETA Endorsements

Pilots will receive only the endorsement for which they are approved. The following table lists the endorsement and explains the activity allowed under that endorsement. It is extremely important for the users to review Appendix A: Definitions section of this Operations Plan to understand what each activity entails and thus ensure that the pilot possesses the proper endorsement for the mission being conducted.

Helicopter Pilot Endorsements for ACETA Operations

Endorsement (In order of low to higher risk)	Hazards/Risks	Pilot Skills/Carding Required
A. Herding > 50' AGL	Aircraft is used to move or drive an animal or group of animals in a particular direction.	Low level & ACETA Gathering/Capture (Herding)
B. Eradication > 50' AGL (flown high as possible)	Eradication for the purpose of this guide is defined as the lethal removal of animals by the use of firearms fired from an aircraft.	Low Level & ACETA Eradication
C. Capture – Darting Projectile Operations > 50' AGL	"Capture – Darting" for the purpose of this guide is defined as firing a projectile for the purpose of administering immobilizing drugs, other treatments, obtaining a tissue sample, or administering a marker (i.e., via paintball) via projectile fired from an aircraft.	ACETA Darting/Paintball, Low level
D. Capture – Trapping < 50' AGL	Using aircraft to capturing target animal(s) in either in a corral type trap or in netting that will entangle them.	Herding, Low Level ACETA Net Gun
E. Capture – Low Altitude Projectile Operations (darting/paint, balls/nets)	In low altitude projectile operations, the ACETA aircraft is normally ten to twenty feet above the ground, maintaining a very close proximity to the animal.	ACETA Darting/Paintball, Low Level

Inventory (counting animals): This is not considered ACETA; however, it is a skill set pilots should have before being approved for "Classification."

Classification (gaining information about a group of animals): This is not considered ACETA; however, it is a skillset pilots should have before being approved for other ACETA missions.

[1] Note that there is a STEP waiver for Alaska when using an R-44 II.

3 ACETA Personnel Qualifications and Requirements

3.1 Position Qualifications

The following outlines all positions that may be involved in an ACETA program and/or operation. Not all positions will be necessary for every mission. In order to be eligible to receive ACETA training for the positions below, the individual must be involved in an ACETA established program or have pending ACETA projects, as well as have support from park leadership and their supervisor.

A. Project Manager

The project manager has overall responsibility for the ACETA missions. The project manager shall meet the qualifications of Helicopter Manager or ACETA gunner as outlined below.

B. Helicopter Manager

A qualified helicopter manager is required for all ACETA missions that use helicopters. The helicopter manager may or may not be involved in the ACETA mission as a gunner or mugger. Depending upon the complexity of the mission, a standalone manager may be warranted.

1. Qualified and current per RM-60.
2. Performs duties of helicopter manager in accordance with Standards for Helicopter Operations.
3. Pre-inspection of aircraft to ensure compliance with the on-call ACETA helicopter contract.
4. Familiar with rigging the aircraft for ACETA operation to be performed.
5. Provides expertise for external cargo.

C. ACETA Instructor

An NPS unit, region, or program will recommend personnel to be designated as an instructor for each ACETA area of specialty. Designation of ACETA instructors shall be approved and renewed annually by the RAM in the form of a letter of authorization. In addition to meeting all ACETA gunner specialty requirements, instructors must have:

1. Required Certifications
   a. Qualified and current as helicopter manager per RM-60.
   b. Qualified in the sub-specialty they instruct (e.g., net gunning, darting, marking, eradication, etc.)
2. ACETA-Specific Requirements
   a. Qualified gunner. Complete an NPS- approved ACETA training course.
   b. Currency: Teach or co-teach an ACETA course every three years.
   c. Proficiency Requirements:
      i. Current ACETA Qualified Gunner.
      ii. Every three years attend or instruct an ACETA training session consisting of at least 24 hours of approved training.

3. Additional Skills & Knowledge
   a. Maintains currency as a gunner with minimum of two years' experience.
   b. Have demonstrated ability as an instructor and assisted in the training of at least two ACETA gunners.

D. Gunner

This person is the primary aircrew member responsible for the safe discharge of a firearm/capture device from the aircraft, while in flight, to accomplish the specialty ACETA operation for which they are qualified.

1. Required Certifications
   a. Qualified and current as helicopter crewmember per RM-60.
   b. Current certification for A-110, Interagency Aviation Transport of Hazardous Material and A-200, Aviation Mishaps Review (required every three years).
   c. Current certification for STEP, if required for the operation.
   d. Meets park/program firearm/capture device qualification training.
   e. Meets requirements in DO-77-4, *Use of Pharmaceuticals for Wildlife,* when applicable.
   f. Current First Aid and CPR.

2. ACETA Specific Requirements
   a. DART GUNNER (including Marking/Biopsy/Paint Ball).
      i. Initial Certification: Complete the initial ACETA course with a Dart Gunning module. Complete a minimum of three live mock-ups without procedural error.
      ii. Currency: Attend ACETA Refresher every three years.
      iii. Proficiency Requirements: Complete three actual, live or static mock-ups in the last 540 days without procedural error. Maintain currency with Chemical Immobilization protocols if appropriate.

   b. NET GUNNER
      i. Initial Certification: Complete an initial ACETA course with a Net Gunning module. Complete minimum of three live mock-ups without procedural error.
      ii. Currency: Attend ACETA Refresher every three years.
      iii. Proficiency Requirements: Deploy three nets in the last 540 days without procedural error during either actual mission or live mock-up **OR** attend an ACETA training session consisting of at least 24 hours of approved training.

   c. ERADICATION GUNNER
      i. Initial Certification: Complete the initial ACETA course with a Net Gunning module. Complete minimum of three live mock-ups without procedural error
      ii. Currency: Attend ACETA Refresher every three years.
      iii. Proficiency Requirements: Complete three actual, live or static mock-ups in the last 540 days without procedural error.

3. Additional Skills & Knowledge
   a. Experienced in animal mugger/handler duties.
   b. Familiar with animal behavior, habitat and how to restrain an animal effectively, efficiently, and safely.
   c. Coordinates and confirms animal selection and capture strategy with pilot.
   d. Demonstrates ability to inspect, care for, and maintain ACETA equipment.

e. Demonstrates ability to rig the helicopter for ACETA, provide a safety briefing and conduct a safety check of ACETA personnel without procedural error.
f. Demonstrates knowledge of emergency procedures (e.g., exposure to wildlife pharmaceuticals, aircraft emergencies, etc.).
g. May prepare or assist in preparation of an animal for sling loading including hover hookups.
h. Trained and competent to shoot from seat positions in the aircraft as necessitated by aircraft weight and balance, ACETA operation, and in coordination with the pilot.

E. Mugger/Handler

This person, while airborne, may assist the pilot with hazard identification and flight following. On the ground the mugger is responsible for assisting the gunner with the capture and as applicable, preparing the animal for transport.

1. Required Certifications
   a. Qualified and current as helicopter crewmember per RM-60.
   b. Current certification for STEP, if required for the operation.
   c. Meets requirements in DO-77-4, *Use of Pharmaceuticals for Wildlife*, when applicable.
   d. Current First Aid and CPR.

2. ACETA Specific Requirements
   a. Initial Certification: Attend the initial ACETA course OR conduct appropriate mentorship under direction of an ACETA qualified darter with five or more years of experience in the mission-specific work.
   b. Currency: Attend ACETA Refresher every three years OR continue appropriate mentorship.
   c. Proficiency Requirements: Maintain appropriate training as required per job description.

3. Additional Skills & Knowledge
   a. May act as spotter during flight; identifies hazards or potential hazards observed and communicates with pilot and gunner during flight. Notifies crew immediately if evasive action is necessary.
   b. Prepares or assists in preparation of an animal for sling loading including hover hookups.
   c. Familiar with helicopter rigging per Chapter 5 for ACETA operations.

F. Observer Helicopter (Spotter)

This person, while airborne, may assist the pilot with hazard identification and flight following. The spotter assists in locating target animals by visual means or radio telemetry.

1. Required Certifications
   a. Qualified and current as a helicopter crewmember per RM-60.
   b. Current certification for STEP, if required for the operation.
   c. Meets requirements in DO-77-4, *Use of Pharmaceuticals for Wildlife*, when applicable.
   d. Current First Aid and CPR.

2. Additional Skills & Knowledge
   a. Identifies hazards or potential hazards observed and communicates with pilot and gunner during flight. Notifies immediately if evasive action is necessary.
   b. Notifies and guides capture aircraft and ground personnel to location of animals.
   c. Provides radio coordination and flight following assistance for capture aircraft.
   d. May monitor status of animals and/or assist with processing once the capture has occurred.

G. Observer Airplane (Spotter)

This person, while airborne, may assist the pilot with hazard identification and flight following. The spotter assists in locating target animals by visual means or radiotelemetry.

1. Required Certifications
   a. Qualified and current aircrew per RM-60.

2. Additional Skills & Knowledge
   a. Identifies hazards or potential hazards observed and communicates with pilot during flight. Notifies immediately if evasive action is necessary.
   b. Notifies and guides capture aircraft and ground personnel to location of animals.
   c. Provides radio coordination and flight following assistance for capture aircraft.
   d. May monitor status of animals.

NOTE: If miscellaneous ground crew, e.g., fuelers**,** veterinarian, animal handlers and/or data collectors must be transported by helicopter they are required to be qualified helicopter crew members or transported by qualified helicopter crewmember(s). For personnel to be transported by helicopter per NPS policy, they must meet the qualifications of an aircrew member or be transported by qualified aircrew members per RM-60.

3.2 Training and Proficiency Requirements

A. Training

NPS employees who demonstrate need shall be trained and qualified in accordance with this ACETA Operations Plan (*see Appendix B*) and established DOI/NPS-specific policy, guidelines, procedures, and training requirements. All cooperators (federal, state, universities, and others) shall comply with these requirements and guidelines when NPS has operational control. If the ACETA operation is performed via an end product contract, where NPS does not have operational control, refer to OPM-35, *Identification of End Product/Service and Flight Service Procurement.*

Demonstration of equivalent training, advanced training, and/or certification by other federal or state agency, university, or manufacturer certified trainer and others may be substituted as determined and approved by the NPS National Aviation Office. Requests for ACETA aviation safety training shall be made through the RAM.

B. Proficiency

ACETA proficiency will be maintained in accordance with the requirements listed above. More frequent proficiency intervals may be identified in the ACETA PASP. ACETA programs may also add this to the park aviation management plan. ACETA proficiency may also be acquired through a routine live helicopter mock-up mission but must be approved by the ACETA project manager and documented.

C. ACETA Training, Currency and Proficiency

If a 540-day period passes without an operation or live mock-up, prior to a mission, a static mock-up per this plan must be conducted using an approved ACETA fleet or vendor pilot and gunner. If 540 days (18 months) are exceeded, an ACETA refresher training is required.

NOTE: A-312, *Water Ditching and Survival* is required if ACETA operations over water will be conducted beyond gliding distance from shore.

3.3 Documentation

Training and qualification(s) of ACETA personnel will be documented by the approved ACETA instructors and the requesting unit personnel. Copies of this documentation must be forwarded to the RAM.

3.4 Cooperators

All cooperator personnel on ACETA missions under operational control of the NPS will meet all requirements of this operational plan.

Cooperator aircraft carrying NPS personnel on ACETA missions must be approved by the process contained in 351 DM 4, *Cooperator Operations*.

4 Equipment for ACETA Operations

4.1 Personal Protective Equipment (PPE)

A. Aviation Life Support Equipment (ALSE)

Project managers and helicopter managers shall ensure appropriate and adequate ALSE is properly used onboard the aircraft. Detailed information is contained in the ALSE Handbook.

Suggested additional items:

- Microphone cover (wind reduction for flight helmet)
- Pocket knife, electrical tape, painters tape (net gunning)
- Strobes and signal mirrors
- Personal locator beacon (PLB)
- Personal survival kit
- Eye protection

NOTE: Due to environmental considerations, deviations from the PPE requirements of the ALSE Handbook may be required. Per RM-60, a PPE Waiver Exception to Policy is required for waivers from the policy.

B. Seat belt

Seat belts must be worn as the primary restraint during take-off and landing and whenever practical throughout the duration of flight. All non-shooting (observer/spotter) personnel seated in the front passenger position must wear the full seat belt restraint system. Seat belt extensions are commonly used to allow gunners to position properly.

NOTE: Per the ALSE Handbook, a lap belt (no shoulder harness) may be used if there is a valid operational or safety requirement. With pilot concurrence, gunners may choose to utilize the lap belt only for proper firing positioning during training or live missions. The shoulder harness must be secured in the aircraft.

C. Secondary Restraint Devices

In addition to the seat belt, all gunners shall wear a secondary restraint during doors off or open operations; the secondary restraint device must consist of an approved harness. Refer to the ALSE Handbook, Chapter 2.4, *Aircrew Member Secondary Restraint System*. Examples include:

Image source: Honeywell International Inc.

1. Approved Full Body Harnesses will meet 29 CFR 1910.66, or 1926.502, or ANSI Z 359.1 Additionally, it is recommended that these devices have no plastic parts or pass through buckles.
   a. Must be commercially made or manufactured by an FAA Master Rigger.
   b. Inspect harness frequently for wear or other damage (e.g., stitching, buckles, webbing abrasion
2. A gunner strap, per 29 CFR 1926.502(e), is required that consists of either an approved tether or harness tether/tether attachment per MTDC drawings #946 and #993. See Appendix D.

   NOTE: No secondary restraint device will be required when the aircraft is equipped with an approved shooting door and operable window that will safely allow a firearm/capture device to be utilized. Operations are restricted to eradication, darting, and marking/paintball. Net gunning is not allowed through a window opening.

D. Carabiners

All carabiners used for ACETA will be of a locking screw-gate, twist or auto-lock design. Both steel and aluminum are approved. Inspect carabiners frequently for proper function of gate and locking mechanisms, abrasions, burrs, rough edges, etc.

NOTE: Load carabiners longitudinally. If the load occurs on the side, i.e., cross gate loading, failure may occur. If screw-gate carabineers are used, be aware of the potential for vibration- induced movement of the locking mechanism.

E. Knife

A knife suitable for rapid seat belt cutting shall be worn and accessible for emergency use.

4.2 Firearms and Capture Devices

Parks and programs anticipating ACETA operations will consider the condition of the following equipment and consider the need for it in their planning process.

A. Firearms
1. Authorized ammunition (i.e., non-lead)
2. Quantity of ammunition sufficient

B. Net guns
1. Quantity of nets, weights, canisters sufficient

2. Canisters loaded properly (weights not cross loaded)
3. Weights tested before use

C. Dart projectile/ remote delivery system

1. Number of darts needed
2. Need for and number of human antagonist kits required

D. Hazing guns

E. Paint/marking guns

F. Additional capture equipment: (e.g., collars, blindfolds, hobbles, data collection equipment, wildlife pharmaceuticals, transport bags, external load equipment, drive and corral traps).

4.3 Equipment Rigging and Management

A. Secondary Restraint and Rigging Attachment Points

All NPS ACETA gunners are required to utilize a secondary restraint system when flying during doors off or open operations.

1. A secondary restraint with either a sewn-in tether or one that is attached by approved carabiners to a tether. The tether shall be attached to the aircraft in accordance with the ALSE handbook (See Fig.4).

2. The secondary restraint must be secured and rigged in a manner that allows the gunner to quickly release it from the aircraft in order to exit the aircraft to assist on the ground or in the event of an emergency (See Fig. 5).

Fig.2. Example of approved seat belt anchor.

Fig. 3. Example of approved seat belt anchor.

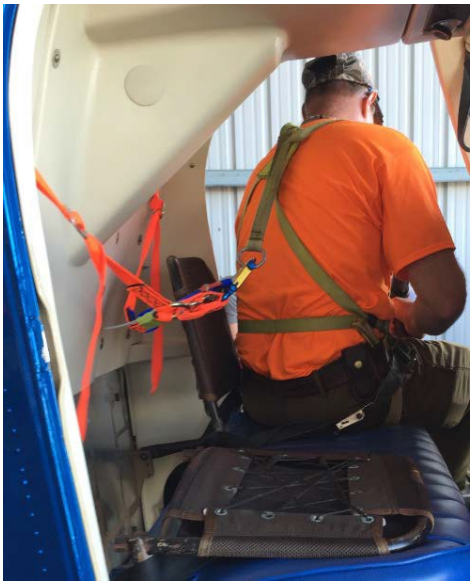


Fig. 4. Example of full body harness, with sewn in tether.

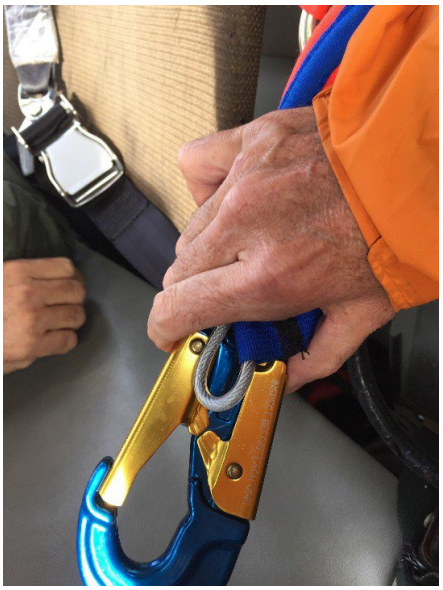


Fig. 5. Example of quick release capability.

B. Equipment Management

All personal items and equipment must be secured in the aircraft. A device or method to secure the firearm/capture device when the gunner has left the aircraft must be in place (See Fig. 6 and 7). Personnel who exit the aircraft during operations will be required to have a means of communicating with the pilot.

Fig. 6. Secured netgun.

Fig. 7. Secured gear bag.

1. **Eradication Gunner**
   a. All extra clips, ammunition and operation-specific equipment must be placed in a container and secured in the aircraft within reach of the gunner.
   b. All semi-automatic firearms will be required to have an approved manufactured round deflector for all ACETA missions.
   c. There must be a device or mechanism to secure the net gun when the gunner departs the aircraft.

2. **Net gunner /Mugger**
   a. Net canisters should be pre-loaded on the ground and nets secured with tape or Velcro within the canister; blue painter's tape is recommended for warm weather, green painters tape for cold weather.
   b. All nets must be inspected for damage and repaired if necessary.
   c. Gunners are responsible for proper packaging of the net canisters to avoid cross over and entanglements during deployment.
   d. All extra nets, canisters, rounds, capture bags and operation-specific equipment must be placed in a container and secured in the aircraft within reach of the gunner.

Fig. 8. Loaded nets and flight helmet.

   e. Gunners are required to immediately secure the empty canisters in the aircraft after discharge of nets.
   f. There must be a device or mechanism to secure the net gun when the gunner departs the aircraft.

3. **Dart Gunner/Mugger**
   a. Darts should be pre-loaded prior to flight.
   b. All extra darts and pharmaceuticals must be in a spill resistant container and secured in the aircraft within reach of the gunner.
   c. Assure proper equipment to remove projectile from the remote delivery device/capture device is available (e.g., push rod).
   d. All personnel will carry a human antagonist kit, if appropriate, for the immobilization drug being used.
   e. There must be a device or mechanism to secure the remote delivery device when the gunner departs the aircraft.

5 Operations

5.1 Operational Requirements

A. Pre-Mission Requirements

Before the first flight of the day, a comprehensive briefing consisting of a minimum of the items below must be conducted. Subsequent briefings will be conducted prior to each day's operation.

1. **Project Aviation Safety Plan -** Per DOI OPM-06, PASPs will be developed for all special use missions. Flight plans should be incorporated into the PASP. Project planning will ensure that a current Aviation Mishap Response Plan is available to dispatcher and/or flight follower. (See the PASP Template in Appendix 3 of RM-60).
2. **Pilot and Aircraft Approvals** - The helicopter manager assigned to the project will examine pilot, aircraft, and fuel truck approval cards to ensure current qualification for the intended (i.e., darting, netting, or eradication) ACETA missions. If there are problems with pilot, aircraft, or fuel truck approval, the flight will not occur until the local aviation manager/dispatch has been notified and discrepancies have been resolved.

B. Mission Requirements

1. **Pre-Mission Briefing** - The pilot, project manager, dispatch, aviation/helicopter manager, and all personnel involved in the project shall review the entire PASP including the mission objective, Go/No-Go Checklist, project schedule, aerial hazard map, radio frequencies, flight following procedures, PPE requirements, animal euthanasia/humane killing protocol, plan for human exposure to wildlife drugs (as needed), communication protocols/hand signals, emergency procedures, (to include proper crash position for lap belt only), etc.
2. **Weight and Balance -** Load calculations must be completed in accordance with procurement documents and DOI Departmental Manuals. All aircraft limitations shall be adhered to during all aircraft operations. OPM-33 ACETA Helicopter Performance provides additional guidance on minimum aircraft performance standards for DOI.
3. **Preflight Briefing -** The pilot must provide an aircraft orientation and a safety briefing to crewmembers, passengers, and ground personnel at the beginning of the project. Whenever crewmembers or passengers are flown, a preflight safety briefing will be conducted. The OAS-112 Aviation Operations Checklist may be used to facilitate this briefing.
4. **Radio Programming / Communications Test -** Prior to flight, all frequencies and tones identified in the PASP will be programmed into the aircraft radios. A functional test will be conducted between aircraft and ground crew, between aircraft and dispatch, and between ground crew and dispatch. Cellular phone and/or satellite service from the operational site should also be functionally tested if applicable.

C. Flight Plans and Flight Following

All flights under the operational control of NPS will be conducted under an approved PASP. Approved flight following methods will be utilized. Examples of flight plans can be found in RM-60.

5.2 Pre-flight Equipment Checks

These final checks should be accomplished right before the commencing the mission, prior to take-off.

A. Weapons Check

- ✓ Firearm/ capture device ready for operations.
- ✓ Spent casing (brass) deflectors/containment in place (if applicable).
- ✓ Sufficient ammunition, darts, net canisters, or paintballs are preloaded and ready for use.

NOTE- Loading nets into canisters and filling darts should only occur on the ground.

B. Personnel Safety Check

- ✓ Prior to a mission, each individual and/or their partner, will perform a safety inspection adapted to the specific mission. These inspections include as applicable: Helmet properly fitted; chinstrap fastened.
- ✓ Eye protection secured.
- ✓ Fire-resistant clothing properly worn.
- ✓ Collar up and flight gear completely zipped/buttoned up.
- ✓ Gloves (Nomex or leather shooting gloves).
- ✓ ALSE-approved footwear.
- ✓ Survival gear carried on body, as needed.
- ✓ PFD (if operating beyond gliding distance to shore).
- ✓ Approved full body harness (when required).
- ✓ Approved tether(s).
- ✓ Inspect stitching and webbing for abrasion, wear or other damage.
- ✓ Carabiners.
- ✓ Seatbelt cutter or knife attached to personnel.
- ✓ Handheld radio operational, correct frequency, extra battery.
- ✓ Hobbles/blindfolds, capture equipment bag(s) (as appropriate).
- ✓ Human drug reversal/antagonist kit (as appropriate).

C. Helicopter Equipment Check

- ✓ Cargo – secure all cargo and remove items not essential to mission.
- ✓ Anchor system for tethers installed, tested and secure.
- ✓ Ammunition, darts, net canisters secure.
- ✓ Seatbelts secured and operational.
- ✓ Maps and mission information secured, but accessible.
- ✓ Door with approved shooting window installed (if applicable).
- ✓ Onboard radios/intercom system (ICS) operational.
- ✓ Automated flight following operational.
- ✓ First Aid & Survival Kits onboard.
- ✓ Sharps Container.

D. Mock-ups

- ✓ ACETA live or static mock-up accomplished if an operational mission hasn't occurred in the past 540 days.
- ✓ Perform STEP mock-up(s) if required per OPM-40, Single-Skid, Toe-In, and Hover Exit/Entry Procedures (STEP) Operations.

5.3 ACETA In-Flight Mission Considerations

A. Reconnaissance

- A helicopter/airplane locates target species and coordinates the capture in accordance with the PASP
- Coordination with spotter aircraft for animal location (if applicable)
- Identify animal locations and discuss specific tactical approaches
- Search patterns
- Spotter/pilot coordinates with spotter aircraft for airspace management
- Spotter/pilot flight following duties

B. Identify Target Animal

- Approach routes and animal position
- Approach timing
- Anticipate likely reactions to aircraft by the animal
- Spotting and engagement actions
- Crew coordination on target selection
- Shooting and terrain precautions

C. Initiate Capture/Eradication Operation

- Discuss flight profile
- Pilot places and maintains aircraft in position for animal capture/eradication
- Gunner communicates verification of target and prepares to shoot
- Gunner or pilot verifies with crew success of attempt and next action
- Gunner communicates to crew that the firearm/capture device is safe and secured

D. Deploy Personnel

- STEP procedures or determination of aircraft landing
- Crew coordination before exiting aircraft
- Gunner/mugger, when warranted, assists the pilot in clearing the landing zone

E. Animal Management

- Personnel check on welfare and performs primary care of captured animal
- Prepare animal for transport (if applicable)
- Process animal (if applicable)
- Maintain ability to communicate with the pilot
- Personnel may be relocated to the capture site as needed

5.4 Post Operations

Perform a post-mission debrief and file a SAFECOM as necessary.

6 Emergency Procedures

6.1 Interagency Aviation Mishap Response Plan

Pre-planning for emergency procedures is a critical component of risk management. Accordingly, ACETA programs must evaluate and discuss potential scenarios and actions that may best mitigate any associated hazards. Training for effective crew resource management should be a part of this process.

This chapter deals specifically with aviation-related ACETA emergency procedures. Additional training, experience is required to address animal health- and welfare-related emergencies.

A site-specific emergency response plan must be included in the PASP.

6.2 Aircraft Emergencies

A. Helicopter Control and Power Maintained

Examples: Caution indicator, chip light on, loss of oil pressure.

- The pilot will continue to fly and notify all ACETA personnel on board and on the ground that precautionary landing will occur as soon as a suitable landing area is found.
- The gunner will make the device safe as appropriate to the firearm/capture device being used.
- Once made safe, the gunner will either secure the firearm/capture device or discard it downward and out of the aircraft.
- Gunner will ensure that all other items (ammunition, net canisters, darts, etc.) are secure and will not discharge.

B. Helicopter Loss of Control or Power, Engine Failure

Examples: Loss of tail rotor authority, transmission failure, compressor stall, engine failure, etc.

- The pilot will declare the emergency to the ACETA personnel onboard.
- The mugger or observer sitting in the front of the aircraft should attempt to declare an emergency to the flight follower.
- The pilot will attempt to land with the aircraft under control and secure the aircraft.
- All personnel should prepare for an emergency, then either discard or attempt to secure equipment.
- Gunner will try to rapidly disconnect shooter’s harness and assume crash position.
- All personnel should brace for an emergency landing.
- Once on the ground, if the weapon hasn’t been discarded, the gunner should try to secure and unload it.

  NOTE: If conducting darting or eradication, there are potential drug exposure hazards or live rounds in event of fire.

6.3 Operational Emergencies

A. Procedural or Equipment Emergencies

Examples: Inadvertent discharge of weapon known or suspected into the aircraft or personnel, shell casing impacting aircraft, net entanglement, etc.

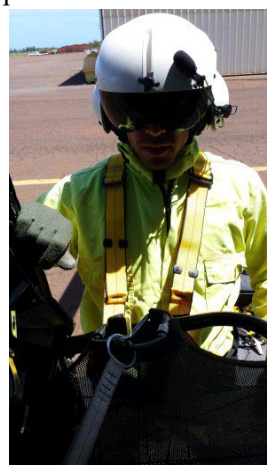
- The gunner must immediately notify the pilot.
- The pilot must land the aircraft immediately.
- The gunner will secure the firearm/capture device and ensure that all other items (ammunition, net canisters, darts, etc.) are secure and will not discharge.
- The pilot, mugger or observer must advise the flight follower of the precautionary landing.
- The pilot will inspect the aircraft to determine if it sustained damage. If there is suspected damage, the aircraft must remain on the ground until maintenance personnel return the aircraft to service.

B. Personnel Falling Out of Aircraft

Example: Gunner inadvertently releases seatbelt and falls out.

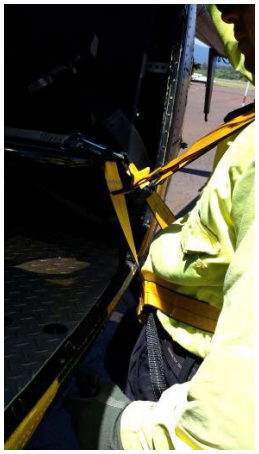
- Gunner must immediately attempt to notify the pilot.
- The gunner will discard the firearm/capture device in a downward direction.
- Gunner will attempt to establish any point of contact with the skids, foot step handhold, floor, seat or harness straps and try to climb back into the aircraft.
- If gunner cannot climb back into the aircraft, then the gunner will secure themselves as best they can until the pilot can safely land.

The photos below show examples of falling out and proper use of harness/straps:



Example 1

Example 2



Example 3

C. Malfunctioning Firearm or Capture Device

Example: Gunner has a firearm/capture device malfunction, misfire, or jam while onboard and in flight.

- The gunner will continue to hold the firearm/capture device out of the aircraft in the downward position and notify the pilot what has happened and ask to land in a safe area.
- On landing, the gunner will continue to point the firearm/capture device down and away from the aircraft, disconnect the harness and seatbelt.
- When approved by the pilot, the gunner will exit the aircraft and clear the firearm/capture device in a safe location, away from the aircraft.
- The gunner will determine the functionality of the firearm/capture device, the crew and pilot will determine whether to continue the project.

The photo below shows an example of a safe direction:

D. Human Exposure to Wildlife Pharmaceuticals

Examples: Needle contact, inadvertent spill with exposure, accidental dart deployment into a person.

All NPS projects that are conducting ACETA operations utilizing chemical immobilization drugs must meet the training requirements as described in DO #77-4 (Use of Pharmaceuticals in Wildlife). Wildlife anesthesia protocols and a Job Hazard Analysis which cover what to do in the case of a human exposure to wildlife pharmaceuticals will be written. Wildlife anesthesia protocols must be signed by the veterinarian of record, the project leader (park practitioner), and the park superintendent or regional natural resource manager. A copy will be included with the PASP.

A briefing must be conducted prior to capture activities which covers what will happen if a human exposure occurs. All personnel participating in the operation must be capable of taking life-saving actions (e.g., CPR, rescue breathing, reversal/antagonist drug administration if appropriate) should an accidental drug exposure occur.

Appendix A: Definitions

The following definitions are used to describe the difference in types of ACETA missions as well as common terms unique to some of these missions as they may pertain to NPS operations. These definitions do not cover all aspects of this type of work.

ACETA

Acronym for Aerial Capture Eradication and Tagging of Animals.

ACETA Program

A park that uses ACETA annually on a regularly reoccurring basis (high frequency).

ACETA Project

Park units that use ACETA on a onetime or infrequent basis.

AGL

Above ground level.

Banding

Placement of an identification device to an animal.

Capture

Restraining an animal using physical (i.e., nets) or chemical means in order to “mark” animals, obtain samples, or for other approved research or eradication purposes.

Capture Device

A device that retains then propels any type of projectile upon the command of a person. This projectile can be a net, paint ball, cracker shell, weights, darts, mortar or any other type of object that is loaded into the device. Normally, the device uses a cartridge and propellant ignited with a primer or a compressed gas.

Census (see Classification)

Chemical Immobilization

Use of wildlife pharmaceuticals to capture and immobilize an animal.

Classification (Survey, Census)

Classification is not considered ACETA. This an operational function conducted to gain information about a group of animals including numbers, age class, gender or structure or to perform a visual evaluation of their overall condition.

Collaring

Attaching a flexible belt-type device to an animal.

Corral Trap

A trap constructed of material that allows animals to be retained but allows the animals to continue to move freely within its borders.

Darting

The act of using a device to propel a projectile that may contain pharmaceuticals (i.e., drugs) for immobilization, vaccination, other treatments or tissue sampling.

Remote Delivery System/Capture device

A device used to fire a projectile containing drugs for immobilization, vaccination, other treatments or tissue sampling.

Drive Trap

A trap constructed with net barriers that allow animals to been trapped with netting that entangles them as they try to push through it. The netting comes free from its suspending structures thus capturing them.

Eradication

Eradication for the purpose of this guide is defined as the lethal removal of animals by the use of firearms fired from an aircraft.

Euthanasia/Humane Killing Protocol

An approved procedure, compliant with the American Veterinary Medical Association's Guidelines for the Euthanasia of Animals, devised to dispatch animals that are physically compromised and require immediate attention to minimize pain and suffering.

Firearm

Per 36 CFR 1.4, a loaded or unloaded pistol, rifle, shotgun or other weapon designed to, or may be readily converted to, propel a projectile by the ignition of a propellant.

Firearm/Remote Delivery System Restraint

System used to restrain unattended firearm/remote delivery system from falling out of the aircraft.

Gear Bag

A soft bag specially designed to be easily anchored to retain any loose objects on or in the aircraft during doors removed or open operations.

Gunner

Crewmember assigned the duty of operating the firearm or capture device during ACETA operations.

Hard Point

Approved attachment point engineered to accommodate load stresses.

Harness

A system worn as a secondary restraint by the gunner when the aircraft is flown with doors removed or open.

Hazing

Causing animals to move from their current location by the presence of any threatening or annoying method.

Hazing Guns

Firearm used to launch firecracker or screamer shells used to cause animals to move.

Helicopter Crewmember

Serves as a trained member of a helicopter crew, assisting the Helicopter Manager in the performance and completion of helicopter missions.

Herding

Aircraft is used to move or drive an animal or group of animals in a particular direction.

Hobbles

Straps, ropes, or any materials used to restrain the legs of animals during capture operations.

Inventory (Animal Counting)

Inventory flights are not considered ACETA. Inventory is the assessment of overall numbers of animals in a specific area and are neither gender- nor age-specific. Flights are typically conducted at low level altitudes (generally 100 feet AGL or higher).

Live Mock-up

This is a proficiency technique that allows pilot, gunners, and spotter/mugger to practice without live animals but utilize stationary targets, 3D animal targets, tires, etc. while conducting an actual flight.

Marking

Use of paint or other methods to mark and identify similar looking animals to prevent confusion with unmarked animals.

Muggers (Animal Handlers)

This is a term used to describe personnel utilized to subdue, blindfold, secure, handle, sample, and collar animals, and to collect scientific data. The term is normally used in connection with net gun capture where the muggers form an integral part of the restraint process.

Net Gun

A device designed to dispense a net for the purpose of capturing animals.

Positioning

Utilizing the presence of the aircraft to cause the desired target animal to arrive at a precise location at the same time as the aircraft and gunner arrive in the proper position to shoot.

Precision Longline

Longline vertical reference placement of loads (animals or cargo) utilizing lines greater than 50 feet. This line is attached to the cargo hook of a helicopter during sling operations.

Pursuit/Engaging

This occurs after the animal is positioned. Pursuit is limited to very short periods of time when the firing of the dart, net, paint ball, etc. occurs. The aircraft is normally ten to twenty feet above the ground, maintaining a very close proximity to the animal.

Radio Telemetry

Radio telemetry is not ACETA. Animals are frequently tagged with radio transmitters that can be used to locate the animal, using an antenna-equipped aircraft or handheld equipment.

Telemetry is often used to locate animals prior to capture/eradication and for follow-up classification.

Rapid Refueling (Hot Refueling)

Refueling of an aircraft while the engine(s) is running.

Shooting Door

An aircraft door that remains closed and that has an opening large enough from which the gunner can fire.

Shooting Window

The term describes the optimum distance, angle, and azimuth between the airborne gunner, aircraft, and intended target. This “zone” provides the highest degree of success in terms of safety for the aircraft, crew and successful capture of the target animal.

Single-Skid, Toe-In, Hover Exit/Entry Procedures (STEP)

Step-out landings are those landings where the helicopter is not in contact with the ground and the center of gravity can shift laterally and longitudinally. Skid/wheel height above the ground is no greater than 24 inches.

Sling load

External load suspended under an aircraft with line lengths of less than 50 feet.

Static Mock-up

This technique is used with an aircraft on the ground, not running, to simulate the use of a shooting zone, pilot communication, spotter/ mugger responsibilities, harness preparedness, emergency procedures, etc.

Tagging

Attaching a device to, or otherwise marking, an animal.

Tether

An approved strap used to connect the gunner’s harness to aircraft hard point with use of the approved tether attachment or directly to the aircraft hard point(s).

Tether Attachment

An approved device between the tether and the aircraft.

Transport Bag

A bag used to transport animals by helicopter from a cargo hook in an upright manner that supports the animals' total weight without using the animal as part of the lifting system.

Trap Site

Physical location of human-made traps used to capture and retain animals.

Trap Wings

Device(s) such as post and wire, jute, or some other material to contain animals, once herded, toward a corral or similar enclosed area.

Trapping

Capturing the target animal(s) in either in a corral type trap or in netting that will entangle them.

Appendix B: Outline ACETA Orientation Safety & Training

1. Course Objectives

1. To provide trainees with a general overview of ACETA and policy requirements.
2. To train for qualification in safe ACETA procedures for specific missions.

2. Training Aids

NPS National ACETA Operations Plan, PowerPoint presentation, and individual lesson aids and materials, STEP Curriculum (if being taught).

3. Lesson Agenda

Lesson 1 – Introduction to ACETA and General Information
Lesson 2 – Aircraft and Pilot Requirements
Lesson 3 – Personnel Duties and Training
Lesson 4 – Equipment
Lesson 5 - Operations
Lesson 6 – Emergency Procedures
Lesson 7 – Static Practical
Lesson 8 – Field Practical
Advanced ACETA Training Recommended Topics

Lesson 1 – Introduction to ACETA and General Information

Time Frame: 1.5 Hours

Training Aids: Chapter 1 of *NPS ACETA Operations Plan*, ACETA Mishap Review, Appendices A *Definitions* and D *Alternative ACETA Planning Checklist* and a list of websites where all other policy documents can be obtained.

Lesson 1 – General Information	**Key Points**
Unit Objectives	
1. Trainees will understand the history, purpose, limitations, and benefits use of ACETA and how it fits into a wildlife or an animal management program.	
2. Recognize and identify potential safety risks in an ACETA environment	
3. Provide trainees with an overview of Departmental and NPS policy requirements	
Outline	
1. Program history	
2. Purpose of ACETA	
a. Components of a capture eradication program	• Review Chapter 1 of the NPS ACETA Operations Plan. • Give examples of where ACETA has been used and alternatives to ACETA. • ACETA terminology – Appendix A.

Lesson 1 – General Information	**Key Points**
3. ACETA mishap review	• Provide SAFECOM examples of how ACETA exposes personnel to high risk flying. • Mishap review PowerPoint presentation. Differences between risk management using NPS personnel versus end contract personnel
4. DOI ACETA policy a. STEP b. Training c. Procurement	DOI Policy 351 Departmental Manual 2.3A and ACETA Handbook – minimal recommendations • OPM-4 Aviation User Training Program • OPM-32 ACETA Helicopter Performance • OPM-35 Identification of End Product/ • Service and Flight Service Procurement. • OPM-40 Single skid, Toe in, Hover exit (STEP) – entry procedures (introduction to STEP, if STEP is taught in this course, more depth will be found later in the course, if applicable.
5. NPS ACETA policy a. Firearm, capture device safety b. IHOG c. Wildlife pharmaceuticals-more later	• Relevant NPS Policy – DO and RM-60 Aviation Management – Adoption of Interagency Helicopter Operations Guide (IHOG) as policy • DO 77-4 Use of Pharmaceuticals in Wildlife • Director's Memo "Get the Lead Out Initiative"
6. Approval processes a. Programs b. Projects	• Ch. 1.2 of this Operations Plan and RM-60, Appendix G, "Components of an ACETA Program or Project"

Lesson 2 – Aircraft and Pilot Requirements

Time Frame: 0.5 Hours

Training Aids: Chapter 2 of *NPS ACETA Operations Plan*, OPM-32 *ACETA Helicopter Performance*, OPM-35 *End Product Contracts,* OPM-29 *Special Use Activities,* Current On-call ACETA Contract

Lesson 2 – Aircraft and Pilot Requirements	**Key Points**
Unit Objective	
1. Understand the aircraft and pilot approval process and requirements	
Outline	
1. Aircraft procurement a. On Call ACETA contract	• Review Chapter 2 of NPS ACETA Operations Plan • Explain On call contracts and alternatives to park provided ACETA operations
2. Overview of aircraft requirements a. Fixed wing b. Helicopter	• Review aircraft performance standards in OPM-32
3. Overview of pilot requirements a. ACETA Endorsements	• Reference OPM-29 • Relevant material in this handbook

Lesson 3 – ACETA Personnel Duties and Training

Time Frame: 1 hour

Training Aids: Chapter 3 of *NPS ACETA Operations Plan*, OPM-35 *End Product Contracts*, 351 DM 4 *Cooperator Operations.*

Lesson 3 – Certification, Currency, and Proficiency	**Key Points**
Unit Objectives	
1. Trainees will identify the roles and responsibilities of personnel involved in ACETA training and missions. 2. Understand the required documents for ACETA training and proficiency	
Outline	
1. ACETA mission personnel a. Roles b. Certification, skills, knowledge	• Review Chapter 3 of the NPS ACETA Operations Plan • Review Qualifications requirements for each position.
2. ACETA training requirements a. Instructor b. Gunner c. Mugger/handler d. Spotter e. Misc. Personnel f. Cooperators	• Review training requirements for each position.
3. Documentation	• Demonstrate how to document training and qualifications for each position.
4. Cooperators	• Provide an overview of 351 Departmental Manual.

Lesson 4 – Equipment for ACETA Operations

Time Frame: 2 Hours

Training Aids: Chapter 4 of *NPS ACETA Operations Plan*, Appendix D: Example Tether and Tether Attachment, Aviation Life Support Equipment (ALSE) Handbook, RM-60

Lesson 4 – Equipment	**Key Points**
Unit Objectives	
1. Trainees will be able to describe personal protective equipment and restraint devices necessary for ACETA missions. 2. Trainees will be familiar with the various firearms and capture devices used in ACETA work.	
Outline	
1. Personal protective equipment (PPE) a. Aviation Life Support Equipment b. Seat belts c. Secondary restraint devices d. Other equipment	• Review chapter 4 of the NPS ACETA Operations Plan. • Review ALSE Handbook requirements. Discuss use of seatbelts vs lap belt only. • Introduce Appendix D. • Discuss, demonstrate additional equipment to be used/secured in the aircraft, e.g., gear bag, firearm/capture device restraint, intercom system, etc. • Explain and show the students how to prepare gear so it is easily accessible, e.g. hobbles, knife, radio, radio cord, etc.
2. Firearms and capture devices a. Nets b. Canisters c. Weights d. Darts e. Ammunition	• Provide examples (real or photos) of capture equipment. • Demonstrate proper use, inspection and repair of all related capture/eradication equipment. • Discuss importance of cleaning/disinfecting nets.
3. Equipment rigging and management a. Eradication firearms b. Net gun c. Remote delivery device	• Demonstrate proper use of restraints and rigging, discuss appropriate operation of firearms/capture devices.

Lesson 5 – Operations

Time Frame: 2-3 hours

Training Aids: Chapter 5 of the NPS ACETA Operations Plan, Appendix E*: Field Briefing Checklist*, RM-60, NSHO, example(s) of a Project Aviation Safety Plan

Lesson 5 – Operations	**Key Points**
Unit Objectives	
1. Trainees will understand pre-flight planning requirements. 2. Trainees will demonstrate proficient pre-flight equipment checks. 3. Trainees will understand how aircraft, rigging and equipment is to be managed during ACETA operations. 4. Trainees will perform multiple static mock-ups in the classroom demonstrating an understanding of in-flight mission duties.	
Outline	
1. Pre-mission planning a. Job Hazard Analyses b. Project Aviation Safety Plan c. Pilot and aircraft approvals	
2. Mission Requirements a. Pre-flight aircraft briefing b. Weight and balance c. Mission specific briefing	• Introduce examples of field briefings/ debriefing as part of mission briefing – Appendix E. • Emphasize importance of standardized communication and hand signals between crew and pilot. • Review importance of placements of cargo/personnel in the aircraft, center of gravity, fore/aft and lateral.
3. Flight plans and flight following	• Review content of a flight plan and how they are filed. • Explain the roles and responsibilities of a flight follower.

Lesson 5 – Operations	**Key Points**
4. Pre-flight equipment checks a. Remote delivery device or firearm check b. Personnel safety check c. Helicopter equipment check	• Discuss the importance of each pre- flight check. • Demonstrate how to check oneself and a partner for the personnel safety check.
5. Mission duties a. Reconnaissance b. Identify target c. Capture/Eradicate d. Door off operations e. Deploy (STEP if needed)	• Discuss mission duties, emphasize that extensive mentoring is critical to proficiency of these duties.
6. Post-mission operations	• Review debriefings and who should attend. • Perform post-mission debrief including an after-action review and how SAFECOMs are filed.

Lesson 6 – Emergency Procedures

Time Frame: 1 Hour

Training Aids: Chapter 6 of the *NPS ACETA Operations Plan*, DO 77-4, Appendices D: ACETA JHA and G: Example Protocol for Use of Anesthesia

Lesson 6 – Emergency procedures	**Key Points**
Unit Objectives	
Trainees will demonstrate how to plan for and respond to an aircraft or operational emergency.	
Outline	
1. Mishap response plan	• Review chapter 6 of the NPS ACETA Operations Plan. • PASP. • Emphasize that preplanning is critical to risk management. Perform scenario planning using available tools such as: o Mishap response plan o Job Hazard Analysis (Appendix C) o Green Amber Red (GAR) Models o Mission briefing/debriefing
2. Aircraft emergencies	• Discuss procedures for gunner/mugger in event of an aircraft emergency. • Mock-up in the classroom the most common aircraft emergencies (e.g., loss of power, projectile hitting the aircraft, falling out, human exposure to pharmaceuticals.
3. Operational Emergencies a. Procedural or equipment emergencies b. Personnel falling c. Malfunctioning firearm or capture device d. Human exposure to wildlife pharmaceuticals	• Demonstrate how to troubleshoot a malfunctioning firearm or capture device. • Appendix F - emphasize to trainees that if wildlife pharmaceuticals are to be used in their ACETA work they need to establish a relationship with a prescribing veterinarian and have a plan for human exposure to drugs. Mentorship is required. • Review examples of Mishap Response Plans.

Lesson 7 – Static Practical

Time Frame: 3-4 Hours – or as needed

Training Aids: *NPS ACETA Operations Plan*, Helicopter, Equipment including PPE, rigging, firearms/ capture devices

Lesson 7 – Static Practical	**Key Points**
Unit Objectives	
1. Trainees will demonstrate proficiency in using their firearm/ capture device for their ACETA mission at a controlled range. 2. Trainees will gain a familiarity with and have an opportunity to use other firearms/ capture devices at a controlled range. 3. Trainees will demonstrate proficiency in performing a pre-mission briefing, rigging a helicopter, securing equipment, obtaining and maintaining a shooting position, communicating with the team, securing the weapon, and exiting the aircraft	**NOTE:** Prior to classroom and static mock-ups, perform remote delivery device or firearm safety check; remove and separate any ammunition, cartridges or charges from the weapons. A controlled range and appropriate oversight (i.e., designated rangemaster for firearms) is required.
Outline	
1. Classroom Mock-Ups	• Once instructor has demonstrated the following, trainees will: o Demonstrate effective and safe firearm/ capture device practices. o Demonstrate proper storage of firing device, ammunition, darts, immobilization drugs or net canisters. o Demonstrate proficiency, comfort, handling, and loading protocol. o Demonstrate shooting zone.
2. Pre-mission briefing	• Designate a trainee to provide a pre-mission briefing prior to static mock-ups.

Lesson 7 – Static Practical	**Key Points**
3. Helicopter static mock-up mission a. STEP	• STEP mock-up is only required if the trainees plan to use this technique in their mission. • It is important to mock-up the communications portion of the mission. • Static mock-up should be appropriate to the mission (e.g. eradication, darting or net gun) • It is important to mock-up the communications portion of the mission.
4. Post-mission debrief	• Designate a trainee(s) to provide a post-mission debrief.

Lesson 8 – Field Practical

Time Frame: 3-4 Hours – or as needed

Training Aids: *NPS ACETA Operations Plan*, helicopter, ACETA equipment including firearms/ capture devices

Lesson 8 – Field Practical	
Objectives	**Note**
1. Trainees will demonstrate safe and proficient shooting, darting, and/or net gunning from a helicopter using stationary or moving targets.	Live mission will be at instructor's discretion; if the trainee is not ready to discharge a firearm/capture device from a helicopter they will not be certified as an ACETA gunner.
Outline	
1. Pre-mission briefing 2. Rigging 3. Repeat abbreviated static mock-up 4. Live mock-up 5. Post-mission debriefing	Trainees will only be required to perform a live mock-up using a firearm or capture device they intend to use for their planned ACETA mission. Proficiency and safe deployment are determined by the ACETA instructor. There are no pre-determined requirements.

6. **Aerodynamics, helicopter capabilities and ACETA operations**
7. **Helicopter ACETA operations safety**
8. **Survival and capture equipment familiarization**
9. **Advanced techniques for data collections/sampling**
10. **ACETA gunner safety equipment**
11. **Release procedures**
12. **Live animal capture**

Appendix C: Job Hazard Analysis – Template

Injury Source for the middle column: SB= Struck by; SA = Struck Against; CBY = Contacted by; CI = Caught in; CB = Caught Between; CO = Caught On; FB = Fall to Below; CW = Contacted with; O = Overexertion or Repetitive Motion; FS = Fall at the Same Level; BR = Bodily reaction; E = Exposure to Chemical, Noise etc.

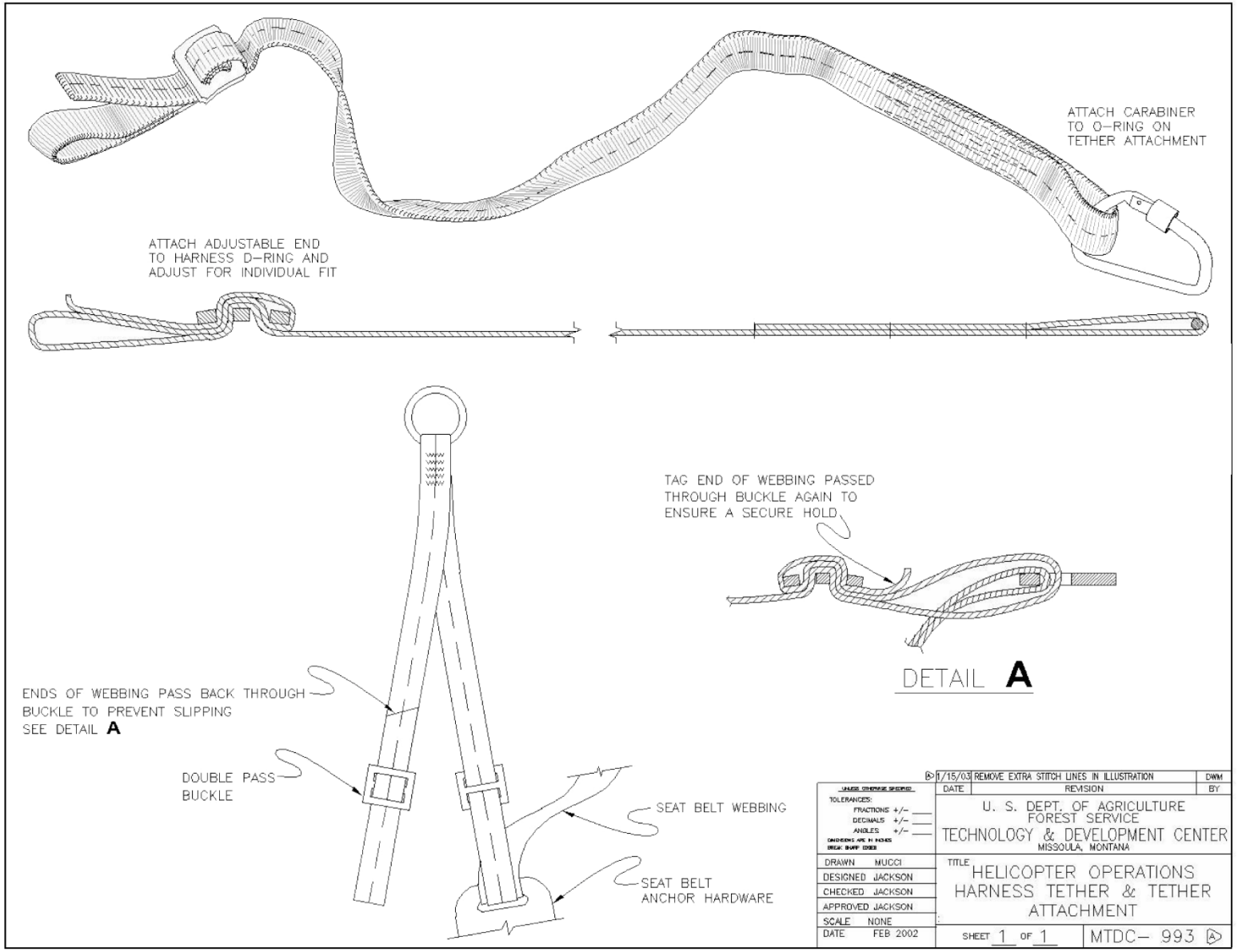
JOB HAZARD ANALYSIS (JHA) ☐ **Date** **Revised JHA** ☐

Park Unit:	**Division:**	**Branch:**	**Location:**
JOB TITLE:		**JHA Number:**	**Page of**
Job Performed by:	**Analysis By:**	**Supervisor:**	**Approved by:**
Required Standards and General Notes:			
Required PPE:			
Tools and Equipment:			

Sequence of Job Steps	**Potential Hazards/ Injury sources**	**Safe Action or Procedure**

*NPS JHA Policy

Appendix D: Example: Tether and Tether Attachment



Appendix E: Field Briefing Checklist

Example 1: Hawaii Volcanoes NP Aerial Darting Specific Mission Briefing Guide

The following drugs are used in darting missions:

1. Name of Drug
   a. Effect on animal and humans
   b. Animal handling procedures and care
   c. Safety precautions
   d. Control and Disposal

   Any lost darts will be accounted for and retrieved as soon as possible.

Known Animal Locations and Specific Tactics

1. Location
   a. Best time to approach
   b. Approach routes
   c. Animal likely reactions to aircraft
   d. Animal Handling Precautions
   e. Flight Safety Precautions
      1. Search Patterns and Fuel Cycles
      2. Spotting and Engagement Actions
      3. Crew Coordination
      4. Mugger/handler deployment
      5. Rotor Blade Clearance
      6. Non-Verbal and Hand Signals used
      7. Doors Off Flight Precautions
      8. Cartridge and Casing Control
      9. Weapon and Animal Handling Equipment Control

Emergency Procedures

1. Weapon Jam or Misfire
2. Loss of control of drug/dart
3. Engine Failure and Crash Landing procedures
   a. Pilot
   b. Spotter
   c. Shooter

Example 2: NPS Field Briefing Checklist for Darting

Date

Weather

Temperature (low/high)

Wind Chill

Wind

Human Safety

- ❑ Wildlife Pharmaceuticals
  - Each team should have "Fact sheet for EMS and healthcare providers" detailing Naltrexone HCl, Carfentanil citrate, and "Accidental Human Exposure to Wildlife Immobilization Agents – Carfentanil"
  - Carfentanil Citrate (Wildnil®)
    - Synthetic opiate with a clinical potency 10,000 times that of morphine
    - Effects on humans: depression of central nervous system, depression or failure of respiratory system. May be fatal if swallowed, injected, inhaled or absorbed through mucous membranes or skin abrasions.
    - Exposure from splash or spill: flush with large quantities of water.
    - Injection exposure: call 911, administer Naltrexone, stay with person
      - 1st antidote dose in lateral mid-thigh through clothing – if full dart exposure, give 3 ml Naltrexone {50 mg per mg Carfentanil that was injected; using 3 mg Carfentanil in darts, therefore 150 mg Naltrexone at 50 mg/ml = 3 ml}
      - 2nd antidote dose – same if no response in 3-5 minutes
      - Additional antidote doses if clinical signs of narcotic poisoning return
  - Xylazine Hydrochloride
  - Ketamine Hydrochloride
  - Naltrexone
  - Yohimbine Hydrochloride (Antagonil®)
- ❑ Remain calm during tense moments; e.g., do not run out of control
- ❑ Locations of human treatment kits, CPR kits, first aid kits, PPE (gloves)
- ❑ Location of MSDS sheets.
- ❑ Rescue breathing or CPR if needed
- ❑ Local weather conditions (lightning, severe weather)
- ❑ Safety practices
  - buddy system
    - tell if suspect exposure
    - watch for abnormal behavior, incoordination (heart attack, hypothermia, etc.)
  - Don't touch dart or dart injection site unless it's your job
  - Dart handling – Sharps containers, latex/nitrile gloves, if stuck in tree add eye protection
  - Don't eat, drink, or smoke around animals (wash hands before do after handling animals)
  - Be aware of traffic as driver and pedestrian
  - Help shooters look for visitors
  - Watch where shooters are and don't be in their way

If volunteers are present add:

- ❑ PPE for animal handling (latex gloves; consider coveralls)
- ❑ Hats/sunglasses/sunscreen/water (effects of elevation)
- ❑ Environmental hazards (footing, cold temperatures, avalanche awareness, ticks)

Wildlife Safety

- ❑ Read TPRs aloud to team leader; guidelines (team leader/vet discretion):
  - Temperature
    - >104°F action to cool
    - >106°F get animal up
    - <99°F action to warm
    - <96°F critical low; actions may be needed before getting animal up
  - Pulse – 40/minute common with Carfentanil; 20/minute action needed
  - Respiration – 4/minute common with Carfentanil
- ❑ Location of warming agents
- ❑ Location of veterinarian emergency pack
- ❑ Reminder – if use 2 darts to get elk down (2x Carfentanil), then administer 2x the Naltrexone dose
- ❑ Watch for faster than normal immobilization, awkward head or body condition, lack of breathing

If volunteers are present add:

- ❑ Stand back, wait for signal to approach
- ❑ Appropriate approach to animal
- ❑ Minimize noise during capture procedures
- ❑ Don't be afraid to call out safety concerns; we want your common sense!!

Team Assignments

- ❑ Team assignments and vehicles; individual roles
- ❑ Team search areas
- ❑ Radio channels
  - CH 1 – Dispatch (direct); CH 2 – Dispatch (repeater)
  - CH 9 – Natural Resources (direct); CH 10 – Natural Resources (repeater)
- ❑ Any concerns/issues we need to know – allergies or medical conditions?
- ❑ CWD assessment sheets

If volunteers are present add:

- ❑ Call numbers/names (including dispatch)
- ❑ Basics – locate/shoot/approach/packs/collection/marking/reversal
- ❑ Any medical qualifications (CPR, EMT, etc.)?
- ❑ Proper clothing/lunch for field

Field Debriefing

Date:

What went well?

What went badly?

Improvements/suggestions for next time:

Additions/revisions to kits:

Safety issues:

Animal specifics:

Additional comments:

Appendix F: Example Protocol For Use Of Anesthesia

Protocol for use of Anesthesia for Brown Bear Capture and Handling in Katmai National Park and Preserve

October 2014

PURPOSE

Brown bears in Katmai National Park and Preserve (KATM) occasionally need to be anesthetized for research and management purposes. This may include anesthesia prior to euthanasia. Outlined below is the protocol for these field procedures.

PARTICIPANTS

The park practitioner (regional wildlife biologist) will be assigned as a work leader for field anesthesia. The park practitioner will be ultimately responsible to the attending veterinarian. Field anesthesia will be performed by qualified NPS staff using only approved techniques and protocols. Deviations from these protocols require approval from the attending veterinarian.

Drugs will be stored under double lock with access limited to approved personnel. The park practitioner will maintain drug inventory sheets. Whenever drugs are used, capture forms will be completed. Capture forms and drug inventory sheets will be forwarded to the attending veterinarian within 30 days of capture.

I. Training and Qualifications

A. All capture team leaders will have the appropriate qualifications/certifications. At a minimum these include:

1. Successfully completed the NPS 24-hour Wildlife Capture and Chemical Immobilization class and eight hours of supervised field captures/immobilization; or successfully completed the minimum training standards as defined in Chapter 5, page 70 and 71 of Natural Resource Management Guidelines NPS-77.
2. Current CPR certification.
3. Current firearm qualification with dart rifle (if a remote delivery system is used) or appropriate knowledge and training of equipment used.
4. If aerial capture, successful completion of the NPS Basic Aerial Capture Eradication and Tagging of Animals (ACETA) Safety and Orientation Training, and requirements for ACETA gunner qualification.

B. All capture participants will have reviewed the relevant guidance documents prior to involvement in field operations. In addition to this protocol these include:

1. Job Hazard Analysis for wildlife handling and anesthesia.
2. MSDS sheets for wildlife pharmaceuticals to be used in the operation.
3. Project Aviation Safety Plan for aerial operations.

II. Participants:

A. Attending Veterinarian:

B. KATM Park Practitioner:

C. Capture Team:

D. Helicopter Manager:

E. Support Personnel:

CAPTURE PERIOD

Three capture periods will be used, May, June-July, and September-October. It is preferred that capture not be conducted under the following conditions:

- Aerial captures will not take place if weather conditions do not meet NPS mandated minimum limits for aviation safety (500ft ceiling and two miles visibility).
- Aerial captures will not take place if steady winds exceed 30 knots or have a maximum gust spread of 15 knots.

NOTE: Research objectives may require the capture of females with cub(s). Cub(s) will not typically be captured but will be allowed to naturally return to their mother post-capture.

IMMOBILIZATION

I. Capture Method

Aerial or free-range darting

A. Bears will be captured and restrained using chemical anesthesia. Bears will be immobilized with anesthesia drugs delivered from helicopter via a syringe (dart) fired from specially designed firearms (dart rifles), using ¾" or 1⅛" needle. Supplemental drugs may be administered via a handheld syringe.

II. Animal Anesthesia

Anesthesia will be accomplished by intramuscular injection to the bear's front shoulder or rear quarter. In the fall, injection will be made on the lower portion of the hind limb or lower shoulder to avoid fat pads. The injection should be made perpendicular to the injection site to ensure proper injection. If the bear needs to be euthanized upon anesthesia, increase anesthetic dose 1.5 to 2 times to ensure a deep plane of anesthesia.

One of the following combinations will be used.

A. Telazol – Aerial darting

1. Anesthesia

Name	Dosage	Route	Concentration/vial
Telazol	8-12 mg/kg	IM	572 mg/vial

To obtain proper volume for administration:

Add 1.8 ml sterile water to 1 vial Telazol powder and mix well to obtain an end volume of 2.5 ml/vial. This yields a concentration of 229 mg/ml.

Administer based on 8 mg/kg dosage:

Bear weight (kg)	Bear weight (lbs.)	Telazol (mg)	Volume (ml)
150	330	1200	5.2
200	440	1600	7.0
250	550	2000	8.7
300	660	2400	10.5
350	770	2800	12.2
400	880	3200	14.0
450	990	3600	15.7
500	1100	4000	17.5

Anesthesia induction times are variable, but generally takes 3-10 minutes.

If the bear is not down in 20 minutes, half to a full dose may be repeated (if signs of sedation are observed use a half dose, if little to no sedation is observed use a full dose).

For larger than average animals or fall captures, bears may require multiple darts to administer the appropriate dose for anesthesia.

2. Reversal-There is no reversal for Telazol. Capture personnel will not remain with the bear during recovery from the drug. The position of the bear upon departure should be natural and offer protection from the elements. Most bears can be left in sternal recumbence (on their bellies) with their heads facing away from the sun. Recovering bears are monitored by fixed-wing spotter aircraft later in the day to confirm their recovery.

III. Anesthesia Drug Considerations

A. Telazol is a schedule III drug. There is no reversal agent.

B. All Drugs:

1. All syringes, needles, and darts used in the capture operation will be delivered to a veterinary clinic or hospital for safe disposal.

2. The aerial capture technique makes recovery of fired darts extremely difficult. Attempts will be made to recover darts when feasible. In areas where human use is expected, approximate location of the lost darts will be determined and mapped for attempted recovery at a later date.

IV. Precautions to avoid exposure to wildlife pharmaceuticals

A. Two people will always be present during loading of syringes or darts to ensure that all safety precautions are taken, and that any accidental exposure or potential exposure is detected immediately and proper first aid and care can be implemented.

B. An emergency medical kit will always be present with the field team. In addition, each individual will carry a personal field kit that includes a CPR mask.

C. Latex gloves and eye protection will always be worn when handling wildlife pharmaceuticals.

D. Darts will only be loaded in a secure, quiet environment (office space or closed, ventilated, non-moving vehicle) where interruptions will not occur.

E. Darts will be stored in original packaging and/or inside of a solid container during transportation.

F. Only those individuals who have met the appropriate training requirements will handle darts or wildlife pharmaceuticals.

G. Basic firearm safety procedures will be followed at all times. Any individual who is using or handling a dart rifle will be qualified with that firearm, will have attended the appropriate firearms training, and will have park approval to use it.

V. Protocol for Treatment of Accidental Human Exposure to Drugs

NOTE: There are many unknown factors for human exposure to wildlife pharmaceuticals. Recommendations in this section are based on the following:

A. MSDS for wildlife pharmaceuticals listed below or the most closely similar wildlife pharmaceutical that has a MSDS.

B. Kreeger, T. J., and Amemo, J.M. 2012. The Handbook of Wildlife Chemical Immobilization.

C. Telazol: Telazol is a dissociative. This section details the procedures for treatment of accidental human exposure to Telazol.

1. Accidental exposure to Telazol can be through ingestion, direct injection, ocular exposure, and mucous membrane exposure.

2. Notification: Inform dispatch of potential accidental exposure and agent. Request park EMS personnel begin to respond to scene non-emergent as patient is observed for additional signs and symptoms.

3. Signs and symptoms include excitement, agitated behavior, loss of coordination, respiratory depression and coma.

4. If signs are observed, upgrade park EMS response to emergent.

5. Treatment and Care

a. There is no antidote.

b. Wrap patient in blanket to achieve a total body restraint.

c. Maintain low-light and quiet surroundings.

d. Be prepared to give rescue breathing and CPR.

VI. Euthanasia and Carcass Removal

Euthanasia: Bears with severe injuries as a result of the capture operation that would result in chronic pain or severe impairment of function will be euthanized (e.g., broken legs, large open abdominal wounds, etc.). Bears may also need to be euthanized for management reasons at the discretion of park (e.g., aggressive behavior towards humans).

A. If euthanasia becomes necessary, two methods are acceptable.

1. Gunshot to head, **using non-lead ammunition of the appropriate caliber.**

a. Euthanasia - Aim at the center of an "X" connecting the eyes and ears (front view) or at the midpoint between the eye and ear (side view).

b. Carcass Disposal- If no wildlife pharmaceuticals were used the carcass can be left in the environment.

2. Two-stage euthanasia (anesthesia followed by euthanasia).

a. Anesthesia - The bear will be placed under a surgical plane of anesthesia (corneal reflex depressed) using Telazol as described above. Then one of the following procedures will be performed.

b. Euthanasia after surgical plane of anesthesia - Dissolve two grams potassium chloride/10 ml sterile water. Then, based on the estimated body weight administer 2-4 grams/50 kilograms of body weight injected via syringe IV into the jugular vein. After death the muscle mass surrounding the **anesthesia** injection site must be removed.

c. Euthanasia after surgical plane of anesthesia - Gunshot to head, neck, or chest. After death the muscle mass surrounding the anesthesia injection site must be removed.

B. Carcass Disposal: Discretion will be used so that the carcass of any bear killed is far enough from areas of human use. Due to the remote nature of KATM, the carcass of most bears killed can likely be left at the site of euthanasia. If the site is deemed to be near an area of human use, the carcass will be moved to the nearest suitable site.

VII. Animal Handling

Upon immobilization, respiration, body temperature and position of the animal should be initially and continually monitored to ensure that the bear is comfortable, stable, and sufficiently and safely immobilized throughout processing.

A. The bear will be positioned on its side or sternum so breathing will not be constricted. The head will be positioned slightly downhill of the body to allow excess salivation to escape.

B. Because bears' eyes remain open while immobilized, the bear should be positioned so that it faces away from the sun and a towel/blindfold laid over the eyes; ophthalmic ointment will be placed in the eye to prevent drying before blindfolding.

C. Temperature is taken rectally, with a thermometer or probe lubricated with K-Y Jelly® and inserted at least two inches to obtain core body temperature. Normal body temperature for

bears is about 101º F (38.3º C). If the observed temperature is greater than 105º F (40.5º C), attempts should be made to cool the bear by packing the chest and groin area with snow or pouring cold water over these regions. The lack of thermoregulatory ability in anesthetized bears can also lead to hypothermia. Body temperatures lower than 98º F (36.7º C) are cause for concern, and handlers should take action to warm the bear. Warming strategies can include moving the bear out of the wind and onto dry ground and/or covering with an emergency blanket. Both warming and cooling of a bear may be a slow process, taking 30 minutes or more, and temperature should be monitored and recorded every 5 minutes until it has reached the desirable range.

D. Respiration will be observed visually, and pulse detected with a stethoscope or manually by palpation of the femoral artery.

E. Capillary refill time, an index of cardiac function, can be measured by pressing on a non-pigmented part of the gum, releasing pressure, and determining the time to restoration of color. A capillary refill time of less than two seconds generally implies adequate blood perfusion. A slower refill time indicates low blood pressure or other circulatory dysfunction.

F. Dart or other wounds found on the bears will be cleaned using an application of diluted povidone-iodine solution. Bears will be given the long-acting antibiotic LA- 200®, which has a concentration of 200 mg of oxytetracycline per ml, at a dose of 10 ml per 100 kg of body weight (20 mg/kg), administered intramuscularly or subcutaneously.

G. All vital signs will be recorded along with the time (military or 24-hour time) on the table provided on the capture sheet.

H. The following steps will occur during animal processing:

1. Sex, age class, weight, and basic morphometrics will be determined.

2. Body composition will be measured by bioelectrical impedance analysis.

3. Hair, claw, blood, breath, feces, and ectoparasites samples may be collected.

4. Radio collars will be fit to animals captured.

I. The withdrawal time of the antibiotics, anesthetic, and reversal drugs is 45 days. Bears captured within 45 days of a time they could be harvested must be marked prior to release to avoid human consumption. This will be done by writing on the radio collar or an ear tag “Do Not Consume—Call (phone number)” or “Do not consume before (date 45 days from anesthesia).”

VIII. Emergency Drug Usage

A. Treatment of severe respiratory depression (<2 breaths per minute) or apnea (i.e., not breathing; holding breath for prolonged intervals).

Name	Dosage	Route	Concentration/vial
Dopram	1-2 mg/kg	IV or under tongue	20 mg/ml

Doses for the 1 mg/kg dosage.

Bear weight (kg)	Bear weight (lbs.)	Dopram (mg)	Volume (ml)
150	330	150	7.5
200	440	200	10.0
250	550	250	12.5
300	660	300	15.0
350	770	350	17.5
400	880	400	20.0
450	990	450	22.5
500	1100	500	25.0

IX. Capture Operation After Action Review

All persons involved in the capture operation will participate in a review/critique of capture operations.

Prepared by:

Date

Park Practitioner, KATM

APPROVED FOR IMPLEMENTATION IN KATMAI NATIONAL PARK AND PRESERVE

Approved by:

Date

Attending Veterinarian

Approved by:

Date:

Superintendent

Appendix G: Components of an Animal Capture, Eradication, or Tagging of Animals (ACETA) Program or Project

This ACETA Operations Manual covers only a portion of what is needed to establish and conduct ACETA operations on NPS lands. The following list of covers some considerations or steps needed to implement an ACETA Program or Project. The list may not be comprehensive; refer to your region or park for specific requirements.

A. Departmental and NPS Policy

All ACETA work must be done in compliance with NPS policy.

B. International Animal Care and Use Committee (IACUC) Project Review and Approval

a. The NPS IACUC team reviews all projects involving vertebrate animals to be used in research, teaching, and training within NPS units. This includes projects already approved by another state or institutional IACUC. Generally, an approved NPS IACUC protocol is needed prior to initiating an ACETA program.

C. NPS Research Permits

a. NPS Research, Permit and Reporting System (RPRS): All ACETA operations occurring on park lands must have a valid RPRS research permit to ensure compliance with park policy and objectives, and comply with the reporting requirement and permit guidelines

b. MRA: If the ACETA work will or could potentially occur within areas of designated wilderness, a minimum requirements analysis (MRA) will be required through the park's internal compliance process.

D. Wildlife Chemical Immobilization Training

a. If immobilizing drugs will be used during the ACETA operations, all personnel in the field handing the animals, i.e., gunners and muggers/handlers, should attend a Wildlife Chemical Immobilization course. These courses may be offered by the NPS Natural Resources Stewardship and Science – Biological Resources Division (NRSS-BRD) – Wildlife Health Branch, state agencies, wildlife sanctuary facilities, or private companies.

E. DEA Registration and Drug Storage

a. Each park with an ACETA Project or Program needs to have at least one person with DEA registration with the appropriate level of certification and comply with all drug storage, inventory and reporting requirements

F. NPS Wildlife Anesthesia Protocol

a. If chemical immobilization drugs will be used during the ACETA operations, the project manager is responsible for developing a protocol with consulting verts (in most cases NRSS-BRD Wildlife Health vet staff) for the administration of the drugs and any reversals, or other drugs that may be used during handling. Protocols must be approved and signed by the veterinarian of record and park project manager.

b. State and/or federal permit may be required to conduct ACETA operations, especially if you may operate in lands outside of the national park unit, for example while pursuing an animal, it may cross jurisdictional boundaries.

G. Collaborator Requirements or Processes

a. State agencies, other federal agencies or university collaborators may have additional steps for compliance in participating in, or using data from, ACETA operations.

H. Aviation Program Compliance

a. All aviation operations must occur according to federal, departmental, regional, and park-specific policy and programmatic guidelines. This includes, developing a PASP for ACETA projects, obtaining and maintaining currency in needed aviation trainings, procuring aircraft following Interior Business Center (IBC) and OAS requirements, pre-flight safety briefings, daily flight Go/ No-Go decisions, etc.

I. Equipment management and procurement

a. ACETA operations require specialized equipment for animal handling, immobilization, collaring or tagging, and gear for personnel as well as aviation specific equipment. Procuring, maintaining and managing all of the appropriate equipment is essential to the success of any ACETA mission and requires significant advanced planning and preparation. See Appendix XI for an example of an equipment list.

J. Preparation for an upcoming ACETA mission

a. The following is an example checklist to prepare in advance of an upcoming ACETA operation. The list is not exhaustive and not all items may be applicable to all projects and additional steps might be required.

Prior to Capture

- ❑ Ensure that the following are current and print and keep a physical copy with capture gear:
  i. Park Research Permit
  ii. NPS IACUC Project Approval - signed
  iii. NPS Wildlife Anesthesia Protocol
  iv. Project Aviation Safety Plan - current, approved and signed
  v. State Scientific Permit, if applicable
- ❑ Aviation task orders in place, pilots carded for mission
- ❑ Make and print capture plan and share with team
- ❑ File flight plans
- ❑ Drugs procured/checked out
- ❑ Check remote delivery device, ensure it is cleaned and working properly
- ❑ Initialize collars, store with magnets off
- ❑ Collar data entered or tracked in appropriate database
- ❑ Collar data subscription activated, if applicable
- ❑ Capture gear and equipment inspected and prepared
- ❑ Prepare darts or relevant delivery device projectile
- ❑ Print capture datasheets, frequency sheets, maps
- ❑ Charge telemetry and communications equipment (i.e. sat phone, air to ground radio)

Capture Checklist- What to Pack the Day Of

- ❑ Helmet and PPE
- ❑ Harness
- ❑ Telemetry gear, antenna and receiver
- ❑ Collars, batteries off and activation verified
- ❑ Data sheets and clipboard/binder (keep some spare data sheets in kit)
- ❑ Weigh pole
- ❑ Remote delivery device (i.e., palmer or pnuedart)
- ❑ Push rod
- ❑ Ammo can with
  - o Darts loaded with drug
  - o Adapters
  - o External Charges
  - o Heat packs
- ❑ Dart charges
- ❑ Remote delivery device adapters
- ❑ Capture kit (details below)
- ❑ Sample kits
- ❑ Collars
- ❑ Extras of all of the following:
  - o Drugs
  - o Prepped and empty darts (barrels, plungers, internal charges, tails, dart tips)
  - o External charges (two brown and one green)
  - o Heat packs
  - o Batteries
- ❑ Communication devices
  - o Sat Phone
  - o Air to ground radio
  - o InReach

Capture Kit

- ❑ Flexible measuring tape
- ❑ Transparent ruler or calipers
- ❑ Scale – 150 lb. capacity
- ❑ Slings/rope for weighing
- ❑ 5-cc syringes and 18 or 20 ga. needles for drug/antibiotic injection
- ❑ Nut drivers: 11/32 and 5/16 in.
- ❑ Metal shears for cutting collar
- ❑ Electricians tape
- ❑ Telemetry Receiver for checking collar freq and status in the field
- ❑ Sharps container(s)
- ❑ Insulated container for blood samples
- ❑ Heat packs
- ❑ Extra immobilizing drugs
- ❑ Sterile water
- ❑ Extra darts, tips, plungers, internal charges, Palmer charges

Sample Collection Kits (5-10)

- ❑ One 15 or 20 cc syringe
- ❑ Two 18-gauge needles (1-in. preferred; 1.5-in. acceptable)
- ❑ Vacutainer tubes: minimum 2 tiger-top, one purple top per kit
- ❑ FTA card
- ❑ Labeled envelopes for hair, swabs, whiskers

Animal Care Kit

- ❑ Gloves
- ❑ Blindfold
- ❑ Thermometer
- ❑ Lubricant
- ❑ Triple antibiotic ointment or Betadine for wound care
- ❑ Ophthalmic ointment (keep from freezing)
- ❑ Sutures or needle and thread
- ❑ Sharp knife or scalpel
- ❑ Injectable antibiotic (penicillin, etc. – keep from freezing)
- ❑ Collapsible bucket or bottle for cold water when temps. are high
- ❑ Space blanket/insulated pad
- ❑ Thermos of warm water
- ❑ Enema kit
- ❑ Isopropyl alcohol (wound care, wetting fur to reveal vein, cooling)
- ❑ Potassium chloride, water, and small container to mix euthanizing solution
- ❑ Tourniquet (optional)