



***Global Wildlife Resources***  
***Mark R. Johnson DVM***  
***Wildlife Veterinarian***

**WILDLIFE HANDLING & CHEMICAL  
IMMOBILIZATION  
FOR WILDLIFE PROFESSIONALS**  
**-GENERAL COURSE OUTLINE-**  
**Mark R. Johnson DVM, Instructor**

**These are the topics typically covered in GWR courses**  
**All labs with live animals have been approved by several**  
**Animal Care and Use Committees.**

**INTRODUCTION**

**A. Instructor:**

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**B. Class members:** Introductions and interests

**C. Class schedule and logistics:**

**D. Homework** - 1) Review course objectives 2) Drug dose calculations

**E. Course objectives:**

1. Discuss ethical issues relating to wildlife capture and handling within a professional context.
2. Identify legal responsibilities associated with wildlife chemical immobilization.
3. Develop & maintain documentation for a chemical immobilization program.
4. Initiate a five-step preparation method for organizing field operations.
5. Understand and discuss advantages and disadvantages of various drug delivery systems.
6. Walk through basic steps and procedures in processing chemical immobilized or physically restrained wildlife.
7. Utilize professional skills, equipment, and attitudes to convey clear messages to the media and public about animal care and professional handling.
8. Follow safety measures which protect field personnel and the public.
9. Understand basic veterinary procedures for patient care and processing including:
  - a. Monitoring temperature, pulse, and respiration.
  - b. Collecting blood and other samples.
  - c. Preventing and treating simple veterinary emergencies.

## **PERSPECTIVES**

### **Objective:**

Discuss ethical issues relating to wildlife capture & handling w/in a professional context.

### **A. Philosophy of animal care and handling**

#### **B. What is our highest goal?**

## **LEGAL RESPONSIBILITIES**

### **Objectives:**

1. Identify legal responsibilities associated with wildlife chemical immobilization.
2. Develop & maintain documentation for a chemical immobilization program.

### **A. DEA**

1. Function
2. What is a controlled substance?
3. DEA Compliance
  - a. Purchasing
  - b. Documentation
  - c. Storage Security

### **B. FDA**

1. Function
2. FDA Bottle labeling
3. Extra label use

## **PREPARATION 5 STEPS**

**Objective:** Initiate a five step preparation method for organizing field operations.

### **A. Project objectives and methods: the BIG picture**

### **B. Handling procedure: A Step by Step Plan**

### **C. Equipment list**

### **D. Field form**

### **E. Euthanasia and other issues**

## **DELIVERY SYSTEMS**

### **Objective:**

Understand and discuss advantages and disadvantages of various drug delivery systems.

### **A. Anatomy of remote delivery systems**

### **B. Delivery systems with powder internal charges**

### **C. Delivery systems with air-pressured internal charges**

### **D. Principles of Remote Drug Delivery**

### **E. Direct Drug Delivery Systems**

### **LAB 1: Drug delivery systems**

Practice a variety of dartguns

Students can bring their dartguns as well

Cover dart diversity, loading, and maintenance

## **IMMOBILIZING DRUGS**

### **Objectives:**

1. Calculate drug volumes given animal weight, drug dose, and drug concentration.
2. Identify immobilizing drugs for wildlife and identify their general effects on animals.

### **A. Calculating Drug Doses**

### **B. Important Terminology**

## **SPECIFIC IMMOBILIZING DRUGS**

### **A. Dissociative anesthetics (Cyclohexamines)**

1. Ketamine
2. Tiletamine

### **B. Alpha-adrenergic Agonists (sedatives)**

1. Xylazine
2. Medetomidine

### **C. Alpha-adrenergic Antagonists**

1. Yohimbine
2. Tolazoline
3. Atipamezole

### **D. Opioids**

1. Etorphine
2. Carfentanil citrate
3. Opioid Antagonists

### **E. BAM and BAM II**

### **F. Accessory Drugs**

1. Atropine sulfate
2. Doxapram hydrochloride
3. Oxygen
4. Calm and quiet movements

## **LAB 2: Needle and Syringes**

Learn safe and controlled use of needles and syringes

Safe recapping of needles; Handling syringe poles

## **PRINCIPLES OF IMMOBILIZATION**

### **Objectives:**

1. Recognize effects of immobilizing drugs demonstrated by animal behavior and vital signs and correlate to specific drugs administered.
2. Recognize which actions of the biologist influence the animal's response to immobilizing drugs.

### **A. Drug effects in wildlife and field signs**

1. Ketamine/xylazine effects
2. Administering the drug
3. Repeating first attempt
4. Options when anesthetized animal begins to respond

### **LAB 3: Patient Monitoring**

Physical exams  
Practice monitoring vital signs  
Field forms

### **ANIMAL HANDLING**

**Objectives:** Describe the principles and equipment for handling the anesthetized animal with care and human/animal safety.

#### **A. BASIC CARE**

- 1. Safety First!**
- 2. Ground Cloth**
- 3. Body position**
- 4. Eye hood**

#### **B. Physical Restraint**

1. Ungulates  
Holding  
Hobbles
2. Canids  
Scruff  
Lateral restraint  
Muzzle  
Snare Pole  
Y Pole

### **PATIENT MONITORING**

**Objective:** Understand basic veterinary procedures for conducting a physical exam and monitoring an animal's vital signs (temperature, pulse, and respiration).

#### **A. Physical Exam**

#### **B. TPR**

1. Temperature
2. Pulse
3. Respiration
4. Pulse oximetry

### **PREVENTATIVE MEASURES**

#### **A. Sterile Technique**

#### **B. Antibiotics**

## **SPECIFIC PROCESSING PROCEDURES**

**Objectives:** Describe the techniques and equipment used for each wildlife processing procedure.

### **A. Weighing**

### **B. Measuring**

### **C. Marking**

1. Ear Tagging
2. Tattooing
3. Radio-collaring - VHF and satellite telemetry
4. Abdominal implants
5. PIT Tags

## **SAMPLE COLLECTION**

**Objective:** Understand basic veterinary procedures for collecting blood and other samples.

### **A. Blood**

1. Why collect blood?
2. Where to collect
3. How to collect, handle, and store

### **B. Tooth Collection**

## **TRANSPORT**

## **FOLLOW-UP AFTER HANDLING**

## **VETERINARY EMERGENCIES**

- A. Hypothermia**
- B. Hyperthermia**
- C. Shock**
- D. Bloat**
- E. Inhaling stomach contents**
- F. Seizures**
- G. Capture Myopathy**
- H. Injuries**
- I. Deep Anesthesia**
- J. Euthanasia**

## **HUMAN SAFETY**

**Objective:** Address our priority for human and animal safety.

- A. Animal Handling**
- B. Preventing human exposure**
- C. Human First Aid**
- D. Waste Disposal**

**LAB 4: Chemical Immobilization with live animals (hand injection):**

1. Chemical immobilization and learning the animal's response to immobilizing drugs
2. Monitoring temperature, pulse, and respiration
3. Processing procedures (blood collection, radio-collaring, etc) appropriate for the species, animal, and hosting organization.
4. Documenting chemical immobilization on a field form
5. Professional mannerisms maximizing animal care and field success

**COURSE HANDOUTS**

- A. DEA and Schedule of Controlled Substances
- B. Drug Storage Inventory
- C. Drug Vial Use Form
- D. Protocol for Wildlife Chemical Immobilization
- E. Isle Royale Wolf Processing
- F. Voyageur NP Wolf Equipment List
- G. Wildlife Handling Field Form
- H. Calculating Drug Doses
- I. Problems for Calculating Drug Doses
- J. Drugs and Doses for Various Animal Species
- K. Physical Examination of the Wolf
- L. Blood from Captured Wildlife: Collection, handling, and storage
- M. Basic Sampling Protocol for Diseases in Live Gray Wolves
- N. Veterinary References for Wildlife Professionals
- O. Vendor materials
- P. Course Evaluation Form