Lesson C4–3

Raising Game Birds

Unit C. Animal Wildlife Management

Problem Area 4. Game Birds Management

Lesson 3. Raising Game Birds

New Mexico Content Standard:

Pathway Strand: Natural Resources and Environmental Systems

Standard: **IV:** Employ knowledge of natural resource industries to describe production practices and processing procedures.

Benchmark: **IV-A:** Prepare presentations to describe how natural resource products are produced, harvested, processed and used.

Performance Standard: **2.** Describe wildlife harvest techniques and procedures.

Student Learning Objectives. Instruction in this lesson should result in students achieving the following objectives:

1. Identify the important factors in hatching game bird eggs.
2. Identify the important factors in brooding game birds.
3. Identify the important factors in growing game birds.
4. Explain the management of a game bird breeder stock.
5. Identify the important factors in feeding game birds.
6. Explain the important components of disease control in game birds.

List of Resources.

The following resources may be useful in teaching this lesson:

Recommended Resources. One of the following resources should be selected to accompany the lesson:

Woodard, Allen E., Ralph A. Ernst, Pran Vohra, Lewis Nelson Jr., and Fred C. Price. *Raising Game Birds*. Leaflet 21046. Davis, CA: University of California, 1978.

Other Resources. The following resources will be useful to students and teachers:

Clauer, Phillip J., George L. Greaser, R. Michael Hulet, and Jayson K. Harper. *Bobwhite Quail Production*. University Park, PA: The Pennsylvania State University, 2002.

Dozier, W. A., III., K. Bramwell, and J. Hatkin. *Bobwhite Quail Production and Management Guide*. Bulletin 1215 Cooperative Extension Service, University of Georgia College of Agricultural and Environmental Sciences, 2002.

Greaser, George L., R. Michael Hulet, and Jayson K. Harper. *Pheasant Production.* University Park, PA: The Pennsylvania State University, 1996.

Hanselka, C. W. & Fred S. Guthery. *Bobwhite Quail Management in South Texas*. Texas Agricultural Extension Service.

Stutzenbaker, Charles D. et al. *Wildlife Management Science and Technology*. 2nd ed. Upper Saddle River, New Jersey: Prentice Hall Interstate, 2003.

Walker, Walter S. and Tom W. Smith. *Raising Bobwhite Quail for Commercial Use*. Mississippi State University. http://www.msstate.edu/dept.poultry/pubs/bwqprod.htm.

Woodard, Allen E. *Raising Chukar Partridges.* Davis, CA: University of California, 1982.

List of Equipment, Tools, Supplies, and Facilities

Writing surface
Overhead projector
Transparencies from attached masters

Terms.

The following terms are presented in this lesson (shown in bold italics):

Set

Interest Approach. Use an interest approach that will prepare the students for the lesson. Teachers often develop approaches for their unique class and student situations. A possible approach is included here.

Ask the class, "Why do people raise game birds?" Take answers from several students, being careful not to indicate whether an answer is correct or incorrect. Anticipated answers would be "for bird dog training," "for release into the wild for hunting," and "for a hobby." Ask the students "No matter what the reason, what does everyone who raises game birds have in common?" "They want strong, healthy adults." Lead this discussion to the lesson objectives.

Summary of Content and Teaching Strategies

Objective 1: Identify the important factors in hatching game bird eggs.

Anticipated Problem: What are the important factors in hatching game bird eggs?

I. It is recommended that beginners start with day-old chicks or eggs purchased from a reputable game bird breeder who can guarantee a product reasonably free of disease. A list of game bird breeders is usually available from the state Department of Natural Resources or your local extension office. There are several factors that should be considered when hatching game bird eggs.

   A. Hatchery and Equipment—Hatcheries should have concrete floors sloped to large drains in every room to facilitate cleaning. Walls and ceilings should be constructed of water-resistant materials. They should be well ventilated with a system designed to provide a uniform supply of clean air in all areas. The temperature should be maintained between 65° and 80°F. In the summer, evaporative cooling systems are used to cool the air and increase the humidity of the incoming air. Adequate oxygen levels and carbon dioxide removal are necessary for embryo development, however the main function of ventilation is to control temperature and to dilute airborne microorganisms during the hatch. An incubator or hatcher should have an automatic temperature control with a narrow range.

   B. Care of eggs—Hands should always be washed with disinfectant soap prior to handling the eggs. Fresh eggs can be stored for a short length of time prior to being set. ***Set*** means being placed in the incubator. The temperature at which the egg is stored determines the length of time eggs can be stored prior to being set. Eggs that have been stored do not hatch as early as fresh eggs, therefore additional time should be allowed for stored eggs to hatch. Also, only nest-clean eggs should be set. Cracked, thin-shelled, misshapen, or abnormal-size eggs should not be set as they hatch very poorly and are likely to contaminate other eggs or chicks.

   C. Incubation—Proper incubation is not difficult, however certain procedures should be followed to ensure success. First, all equipment should be washed with detergent solution. After cleaning, the equipment should be operated for at least 24 hours prior to set-

ting eggs. During this time, record the wet and dry bulb temperatures at least twice a day to ensure the equipment is working properly. Eggs can be set either large end up or horizontally, but never small end up. They should be turned every 2 to 4 hours during the first two-thirds of incubation or until transfered to the hatcher, but never during the hatching period.

D. Examination of eggs—Game birds should be candled after 7 to 10 days of incubation and again as transfered to the hatcher (3 to 4 days before hatch). Remove all eggs that are clear or contain blood rings. These eggs will not hatch. These eggs are either infertile or the embryos failed to develop properly.

E. Transfer to hatcher—Transfer eggs to the hatcher 3 to 4 days before hatching. Adjust the temperature settings on the equipment to the proper levels for the species of eggs being hatched. When the hatch is completed, sort, count, and place the chicks in new chick boxes or plastic boxes that have been cleaned and sanitized. Be sure to allow enough time for chicks to dry, however do not leave chicks in the hatcher for too long as this will cause the chicks to dehydrate.

There are many techniques that can be used to assist students in mastering this material. Students need text material to aid in understanding the important factors in hatching game bird eggs. Raising Game Birds is recommended. Use TM: C4–3A thru TM: C4–3C to aid in the discussion on this topic.

Objective 2: Identify the important factors in the brooding game birds.

Anticipated Problem: What is involved in brooding game birds?

II. Artificial brooding of game birds has become very successful. There are several factors that must be addressed during this stage of a chick's life.

A. Heat sources—Many types of heat sources can be used successfully for brooding. Some examples are heat lamps, hot water or steam pipes, or stoves. There are two types of brooding systems: cool-room brooding and warm-room brooding.

1. In cool-room brooding, birds are provided a heat source with an adjacent area held at a lower temperature. Temperature of the hover area is usually adjusted to 95°F during the first week, and then the temperature is decreased approximately 5°F per week until the room temperature is reached. Advantages of this system are that chicks feather more quickly and temperature regulation is easier.

2. In warm-room brooding, a heating system maintains the entire house or room at the desired temperature. Chicks can be started at a temperature of approximately 90°F. Like cool-room brooding, this temperature is decreased as the chicks become older.

B. Light and Ventilation—It is important that brooding pens be properly lighted during the first week so that young chicks will learn to eat and drink. During this time, the brooding pens are lighted 24 hours a day. After the first week, the light may be reduced to 12 hours a day or natural daylight.

There are many techniques that can be used to assist students in mastering this material. Students need text material to aid in understanding the important factors in hatching game bird eggs. Raising Game Birds is recommended.

Objective 3: Identify the important factors in growing game birds.

Anticipated Problem: What are the important factors in growing game birds?

III. The basic principles and techniques for growing game birds apply equally to most species. To be successful, the breeder adapts the basics to meet the needs to their specific operation.

A. Cages and pens—Chukars and quail can be grown successfully in all-wire cages kept inside a building. About 1 square foot per bird is adequate for chukars and a ½ square foot for quail. Outside pens for growing or holding breeder stock should be constructed to permit good drainage of water. To provide protection from wind, the lower walls of pens should be boarded to a height of 20 to 24 inches. The space requirements for growing ornamental pheasants are greater than for other pheasants because of their timid behavior and elaborate feathering.

B. Cover crop—A good cover crop helps in obtaining optimum growth and good feathering in game birds. A number of wild annual grasses as well as perennials such as alfalfa, sweet clover, and fescue, provide excellent ground cover.

C. Waterers and feeders—A continuous supply of fresh, cool drinking water must be provided. Precautions should be taken to avoid puddling around waterers. This can be accomplished by having a screened platform or dry well filled with rock around the waterer. There are several feeder designs for a grower to choose from. It is important to keep all feeds covered to prevent them from getting wet.

There are many techniques that can be used to assist students in mastering this material. Students need text material to aid in understanding the important factors in growing game birds. Raising Game Birds is recommended. Use TM: C4–3D to aid in the discussion on this topic.

Objective 4: Explain the management of game bird breeder stock.

Anticipated Problem: What should be done to manage game bird breeder stock?

IV. As with other types of livestock and poultry operations, the breeder stock of a game bird operation requires extra attention.

A. Cages and pens—Pheasants can be housed in wire colony cages. A mating ratio of ten females to one male is recommended in a colony pen measuring 2 feet wide by 6 feet long by 1.5 feet high. A good rule of thumb is to maintain about 25 to 30 square feet per bird.

B. Equipment—In addition to waterers and feeders, nest boxes should be included in the pens of breeder birds. Nest boxes placed in protected areas greatly reduce the incidence of dirty eggs and prevent bacterial contamination. A wooden box 2 feet wide by 6 feet

long by 1 foot high, will serve about 24 females. Artificial eggs can be placed in the nests well in advance of the laying season to encourage the birds to use the nesting boxes rather than to lay eggs randomly on the ground.

C. Care of eggs—Proper handling and care of eggs are extremely important in maintaining hatchability. Eggs should be stored in a cool room maintained at about 50° to 60°F and 70 percent humidity. The following are recommendations for proper care of eggs.
   1. Keep nest areas dry.
   2. Collect eggs a minimum of three times daily.
   3. Do not spray insecticides around breeder pens or the egg holding room.
   4. Eggs with slightly soiled shells can be cleaned with light sandpaper. Do not used heavily soiled eggs for hatching.

D. Lighting—Game birds can be induced to lay at any time of the year provided they have been exposed to day-lengths of less than 12 hours for a minimum of 6 weeks before they are given stimulatory light. A series of incandescent lights placed above the breeder pens can furnish the light necessary to stimulate early egg production.

There are many techniques that can be used to assist students in mastering this material. Students need text material to aid in understanding the management of game bird breeder stock. Raising Game Birds is recommended.

Objective 5: Identify the important factors in feeding game birds.

Anticipated Problem: What factors should be considered when feeding game birds?

V. Common poultry feeds that are properly balanced in energy, amino acids, vitamins, and minerals can be fed to game birds. Laying rations should never be fed to day-old chicks because such diets contain high levels of calcium, which can be harmful to growing birds.

   A. Grit should be placed in a separate container from the feed. The size of the grit depends on the size of the bird. Fine gravel is an acceptable substitute for purchased grit.

There are many techniques that can be used to assist students in mastering this material. Students need text material to aid in understanding the important factors in feeding game bird eggs. Raising Game Birds is recommended.

Objective 6: Explain the important components of disease control in game birds.

Anticipated Problem: How can I control disease problems in game birds?

VI. Most diseases affecting game birds are caused by microorganisms or viruses spread from bird to bird directly or indirectly. The greatest threat to any game bird operation is disease.

   A. Some good disease management practices that should be followed are:
      1. Avoid introducing live birds—If new stock must be introduced, the only relatively safe way is by means of hatching eggs or day-old chicks.

2. Buy chicks from known sources—Purchase chicks from a breeder with a reputation for producing disease-free stock.
3. Dispose of dead birds properly—This can be done by:
   a. Incinerator
   b. Disposal pits
   c. Direct burial
   d. Rendering truck

There are many techniques that can be used to assist students in mastering this material. Students need text material to aid in understanding the important components of disease control in game birds. Raising Game Birds is recommended.

Review/Summary. Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. Questions at end of chapters in the textbook may also be used in the review/summary.

Evaluation.

Answers to Sample Test:

Part One: Completion

1. 65; 80
2. Set
3. large; small
4. cool; warm
5. ten
6. microorganisms; viruses

Part Two: Short Answer

1. Avoid introducing live birds, buy chicks from known sources, and dispose of dead birds properly
2. 3 to 4 days before hatch

Sample Test Name_____

Test

Lesson C4–3: Raising Game Birds

Part One: Completion

Instructions. Provide the word or words to complete the following statements.

1. Hatchery temperature should be maintained between _____° and _____°F.
2. _____ means being placed in the incubator.
3. Eggs can be set either _____ end up or horizontally, but never _____ end up.
4. There are two types of brooding systems: _____-room brooding and _____-room brooding.
5. For pheasants, a mating ratio of _____ females to one male is recommended in a colony pen.
6. Most diseases affecting game birds are caused by _____ or _____.

Part Two: Short Answer

Instructions. Provide information to answer the following questions.

1. Identify four things operators can do to help control diseases in game birds.

2. When should eggs be moved to the hatcher?

TM: C4–3A

Holding-Room Temperature as Affected by Storage Time

Duration of Storage	Maximum Storage Temperature	
days	*° F*	*° C*
1	70	21.1
2–4	65	18.3
5–10	60	15.6
Over 10	55	12.8

Conditions for Incubation of Pheasant, Partridge, and Quail Eggs

Machine Type	Incubation Temperature		Hatching Temperature	
	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb
Fan ventilated	99.5°–100°F (37.5°–37.8°C)	82°–86°F (27.8°–28.3°C)	98.5°F (37.5°C)	90°–92°F (32.2°–33.4°C)
Still air	102°–103°F (38.9°–39.4°C)	88°–90°F (31.1°–33.3°C)	100°–101°F (37.8°–38.3°C)	88°–92°F* (31.1°–33.3°C)

* Wet bulb temperature is not an accurate measure of relative humidity in still-air incubators.

TM: C4–3C

Incubation Periods for Several Popular Game Birds

Bird	Days
Chinese Ring-necked Pheasant	23–24
Mongolian Ring-necked Pheasant	24–25
Red-legged Partridge	23–24
Hungarian Partridge	24–25
Bobwhite Quail	23–24
California Quail	23–24
Japanese Quail	17–18
Wild Turkey	28

Suggested Pen Size and Bird Density

Species	Pen Size		Bird density
	Width	Length	
	ft	*ft*	*sq ft/bird*
Pheasant	50 or 100 (15 or 30 m)	150 (45m)	15* (1.35 sq m)
Chukar	50 or 100 (15 or 30 m)	150 (45m)	10 (0.93 sq m)
Quail	50 (15 m)	150 (45m)	4 (0.37 sq m)

* Double the space required for each species if growing pens do not have adequate vegetative cover.