

## **Professional Standards for the Use of Live Animals in Environmental Educational**

Developed by the Iowa Association of Naturalists (1994) Co-sponsored by the Iowa DNR

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### Definition

The Iowa Association of Naturalists recommends the following standards be implemented when using live animals in environmental education programs and displays, for the following reasons:

- Live animals may be effective educational tools when properly incorporated into programs;
- Since live animals make lasting, impressions on audiences, they may be used to emphasize information and issues;
- The interpretation of live animals may help people make personal connections with the natural environment and the topic being presented;
- The decision to use live animals for environmental education programs requires careful consideration and planning;
- Inappropriate use and display of live animals may create a lasting negative impression on audiences and may foster disrespect for wildlife.

### Standards

These standards are not mandatory. However, they are recommended to give direction to organizations and individuals developing live animal programs and displays.

#### I. Considerations

##### A. Legalities

1. All appropriate permits **MUST** be obtained before acquiring an animal.
2. Federal permits are required for all migratory species. This includes all birds except House Sparrows, European Starlings, feral pigeons, and upland game birds. Information on federal permits can be obtained by writing:

U.S. Fish and Wildlife Service - Law Enforcement  
P.O. Box 45 - Federal Building  
Fort Snelling, MN 55111-0045  
(612) 725-3776

3. State permits are required for all species native to Iowa. Information on State permits may be obtained by writing:

Iowa Department of Natural Resources - Licenses Bureau  
Wallace State Office Building  
Des Moines, IA 50319

(515) 281-5638

## B. Types of Animals

1. A program or interpretive plan should be written to justify the need for using specific species of live animals for programs or displays.
2. Sources of captive-bred animals should be sought rather than removing animals from the wild.
3. Captive-bred or permanently crippled wild animals that are comfortable in front of audiences are appropriate for use in educational programming.
4. Animals must be determined to be permanently crippled or not releasable by a licensed rehabilitator and a veterinarian.
5. Animals undergoing rehabilitation should not be used for education. Federally protected species undergoing rehabilitation can not legally be used for education.
6. Healthy fish, amphibians, and reptiles should be removed only temporarily from their natural environment. Temporary is defined as releasing an animal so as not to interfere with a significant life cycle event such as breeding or hibernation. Permits are required for the temporary removal of these animals.
7. Federally protected birds can not legally be removed from their natural environment at any time.
8. Quality care must be provided in cases of temporary confinement. If this is not possible, the animals should be released within 24 hours.
9. Animals should be checked thoroughly for disease before they are released. If there is a chance of disease transmission to wild populations, the animal should not be released.
10. Animals that could be dangerous to audiences should not be used for education.
11. Historic domestic breeds of animals may be useful in cultural interpretation.
12. Use of domestic animals in public exhibits or programs is not considered environmental education and falls under the regulations of the U.S. Department of Agriculture.

## C. Care and Facilities

1. Economic and time limitations should be considered before acquiring animals.
  - a. Start with a small number of animals to ensure appropriate care and quality interpretation can be provided.
  - b. Before obtaining an animal, research should be conducted to determine appropriate housing and diet.
  - c. Smaller species tend to require less space and food.
2. The care and facilities of captive animals should reflect the most current information available on the species featured.
3. The physical and psychological well-being of each animal should be a primary concern.
4. Animals on public display for passive interpretation should be housed in facilities that resemble their natural environment.

5. Signing on live animal displays should include at least the following information:
  - a. the animal's common name
  - b. the animal's scientific name
  - c. the animal's habitat and food requirements
  - d. the animal's distribution and population status in the wild
6. A qualified veterinarian should be contacted whom will be able to care for each live animal as necessary.
7. Secure and comfortable transport methods, with the appropriate temperature and humidity conditions, should be available to move live animals to program locations.
8. Facilities should be reevaluated and inspected for maintenance needs at least annually.
9. A daily care sheet should be kept for each live animal. Prompt attention should be given by the primary caretaker when abnormalities are noticed. See attached "Daily Evaluation Form".

## II. Interpretation

### A. Programs

1. An interpretive program plan should be written to include all animals used in educational programs and displays. The agency's mission statement and goals should be incorporated into this program plan. See Creating a Long-term EE Plan published by Iowa Association of Naturalists.
2. Always consider alternatives to using live animals. Some examples could include mounts, skins, skulls, wings, feathers, feet, slides, videos, and pictures. Permits are required for most salvaged animal parts.
3. Anthropomorphism should be avoided.
4. The use of live animals should be to reinforce or illustrate a program or an interpretive display.
5. For those species held temporarily, the program should emphasize that the animal will be returned to its natural habitat. An explanation should be provided for species held permanently (for example imprinted animals or amputees).
6. Audiences should be made aware of the legalities and permits necessary to keep a wild animal in captivity.
7. Audiences should be made aware of the ecological niche filled by each animal.
8. The animal should be comfortable around groups of people before they are used in front of audiences. If an animal shows signs of stress, it should be placed in a comfortable environment immediately.
9. Training of animals may be useful to demonstrate an animal's natural ability, but an animal should not be trained to perform unnatural acts or "tricks."
10. Animals used for environmental education should not be treated as pets. Careful consideration should be given before a program or display animal is given a name. If an animal is given a pet name, the interpreter should explain

the reason this name was chosen. A program should emphasize the species of animal and its unique characteristics.

11. Physical contact between the audience and the program animal should be determined on a case by case basis.
  - a. Liability issues should be explored before an animal is used in a hands-on interpretive program.
  - b. It is illegal to allow an audience to have contact with animals held on federal education permits.
  - c. Contact should not be allowed if there is the possibility of danger to the animal or the audience or if there is danger of disease transmission.
  - d. Members of the audience should never be pressured into touching or holding a live animal.
  - e. Policies on physical contact for each animal should be included in the program plan.
12. Program statistics and handling records should be kept for each animal to ensure that an animal is not handled excessively. See attached form.
13. Programs and displays should be evaluated at least annually to ensure current techniques are used and accurate information is presented to audiences.

#### B. Training

1. Interpreters should be aware of the physical abilities and emotional tolerances of each animal.
2. Animals should not be placed in situations that may cause the animal undue stress or threaten the safety of the animal or audience.
3. The primary caretaker should work with zoos, naturalists, falconers, rehabilitators, veterinarians, or other professionals to learn how to handle and care for each program or display animal.
4. Caretakers and interpreters should review current literature and attend relevant workshops to keep up-to-date for each program or display animal concerning natural history, interpretive methods, handling techniques, and proper care.
5. The primary caretaker should be responsible for training temporary caregivers, interns or volunteers.
  - a. Policies and procedures should be established for each program animal. These policies should ensure that each animal receives appropriate care.
  - b. Program outlines should be available to ensure audiences receive consistent information from each interpreter. See example outline.
6. Memberships should be kept current in relevant organizations that focus on live animal care and interpretation.

### III. References

#### A. Organizations

1. American Association of Zoological Parks and Aquariums (AAZPA), Oglebay Park, Wheeling, WV 26003-1698 (304) 242-2160
2. American Livestock Breeds Conservancy, P.O. Box 477, Pitsboro, NC 27312 (919) 542-5704
3. Bat Conservation International, P.O. Box 162603, Austin, TX 78716

4. International Wildlife Rehabilitators Council, 1171 Kellogg St., Suisun, CA 94585
5. Iowa Association of Naturalists (IAN), 2473 160th Rd., Guthrie Center, IA 50115
6. Iowa Conservation Education Council (ICEC), 33 Curtiss Hall, ISU, Ames, IA 50011
7. Iowa Department of Natural Resources - Wildlife Diversity Program, 1436 255th St., Boone, IA 50036 (515) 432-2823
8. Iowa Falconers' Association, P.O. Box 1160, Burlington, IA 52601
9. Iowa Herpetological Society Inc., P.O. Box 166, Norwalk IA 50211
10. Iowa Ornithologists' Union, 1601 Pleasant St., West Des Moines, IA 50265
11. Iowa Raptor Foundation, P.O. Box 1316, Cedar Rapids, IA 52406
12. Iowa Wildlife Rehabilitators Association RR P.O. Box 217, Osceola, IA 50213
13. National Audubon Society, 950 Third Ave., New York, NY 10022
14. National Wildlife Rehabilitators Association 14 N 7th Ave., St. Cloud, MN 56303 (612) 259-4086
15. Raptor Research Foundation, 12805 St. Croix Trail, Hastings, MN 55033
16. The Wildlife Society, 5410 Grosvenor Lane, Bethesda, MD 20814-2197 (301) 897-9770
17. The Wildlife Society (Iowa Chapter), Boone Research Station, 1436 255th Street, Boone, IA 50036 (515) 432-2823

#### B. Centers

1. Blank Park Zoo, 7401 SW 9th St., Des Moines, IA 50315 (515) 285-4722
2. Living History Farms (historic Breeds), 2600 111th St., Urbandale, IA 50322 (515) 278-5286
3. Macbride Raptor Center (Raptor Education), E216 Field House, The University of Iowa, Iowa City, IA 52242 (319) 335-9293
4. Macbride Raptor Center (Raptor Rehabilitation), Horticulture Department, Kirkwood Community College, 6301 Kirkwood Blvd. SW, Cedar Rapids, IA 52406 (319) 398-5441 or (319)644-2039
5. The Raptor Center, 1920 Fitch Ave., St. Paul, 55108 (612) 624-4745
6. Wildlife Care Clinic, College of Veterinary Medicine, ISU, Ames, IA 50011 (515) 294-4900

#### C. Amphibians and Reptiles

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  - a. Alderton, D. 1988. Turtles and Tortoises of the World. Facts on File Publication.
  - b. Behler, J. L. and F. W. King. 1979. The Audubon Society Field Guide to North American Reptiles and Amphibians. New York: Alfred A. Knopf, Inc.
  - c. Breen, J. F. 1974. Encyclopedia of Reptiles and Amphibians. T. F. H. Publications, Inc.

- d. Christiansen, Dr. J. L. and Dr. R. M. Bailey. 1988. The Lizards and Turtles of Iowa. Des Moines: Iowa Department of Natural Resources, Nongame Technical Series No. 3.
  - e. Christiansen, Dr. J. L. and Dr. R. M. Bailey. 1991. The Salamanders and Frogs of Iowa. Des Moines: Iowa Department of Natural Resources, Nongame Technical Series No. 3.
  - f. Christiansen, Dr. J. L. and Dr. R-M. Bailey. 1988. The Snakes of Iowa. Des Moines: Iowa Department of Natural Resources.
  - g. Conant, R. 1991. Reptiles and Amphibians (Eastern/Central Northern America Peterson Field Guide. Houghton Mifflin, Co. (This book contains information about transporting herps.)
  - h. Ernst, C. H. and R. W. Barbour. 1972. Turtles of the United States. The University Press of Kentucky.
  - i. Halliday, T. and K. Adler. 1986. The Encyclopedia of Reptiles and Amphibians. Equinox Ltd.
  - j. Johnson, T. R. 1987. The Amphibians and Reptiles of Missouri. Jefferson City: Missouri Department of Conservation. (P.O. Box 180, Jefferson City, MO 65102-0180)
  - k. Kauffeld, C. 1969. Snakes: The Keeper and the Kept. Doubleday Publishers.
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  - m. Pritchard, Dr. P. C. H. 1979. Encyclopedia of Turtles. T. F. H. Publications, Inc.
  - n. Smith, H. M. and E. D. Brodie, Jr. 1982. A Guide to Field Identification of the Reptiles of North America. New York: Golden Press.
  - o. Vogt, R. C. 1981. Natural History of Amphibians and Reptiles. Milwaukee: Milwaukee Public Museum and Friends of the Museum.
2. Medical Care and Rehabilitation
- a. Anderson, A. Lizard Husbandry . Iowa Herpetological Society Inc. (P.O. Box 166, Norwalk, IA 50211)
  - b. Anderson, A. Aquatic Turtle Husbandry. Iowa Herpetological Society. (P.O. Box 166, Norwalk IA 50211)
  - c. Care in Captivity: Husbandry Techniques for Amphibians and Reptiles. 1989. Chicago: Chicago Herpetological Society. (2001 N Clark St., Chicago, IL 60614 or (312) 549-0606
  - d. Demeter, B. 1989. Herpetological Husbandry for the Naturalist. (508 Lincoln Av., Takoma Park, MD 20912)
  - e. Frye, F. L. 1981. Biomedical and Surgical Aspects of Captive Reptile Husbandry. Edwardsville: VM Publishing Co.
  - f. Marcus, L. 1981. Veterinary Biology and Medicine of Captive Amphibians and Reptiles. Philadelphia: Lea and Febiger.
  - g. Mattison C. 1982. The Care of Reptiles and Amphibians in Captivity. Poole: Blandford Press.

- h. Murphy, J. B. and J. T. Collins, Editors. Reproductive Biology and Diseases of Captive Reptiles. Society for the Study of Amphibians and Reptiles.
- i. Recommendation for the Care of Amphibians and Reptiles in an Academic Institution. 1991. Institution of Animal Laboratory Research Newsletter, Volume 33, #4:s5-s21.
- j. Smith, H. Snakes as Pets. Neptune: T.F.H. Publications.
- k. Ulrick, K. Care and Maintenance of Box Turtles in Captivity. Iowa Herpetological Society. (P.O. Box 166, Norwalk IA 50211)
- l. Ulrick, K. Care and Maintenance of Frogs, Toads, and Salamanders. Iowa Herpetological Society. (P.O. Box 166, Norwalk, IA 50211)
- m. Ulrick, K. Care and Maintenance of Snakes in Captivity. Iowa Herpetological Society. (P.O. Box 166, Norwalk, IA 50211)

### 3. Curriculum

- a. Nature Scope: Lets Hear it for Herps! Washington, D.C.: National Wildlife Federation. (400 16th St. NW, Washington, DC 20036-2266)

## D. Birds

### 1. Natural History

- a. Beebe, F.L. and H.M. Wester. 1989. North American Falconry and Hunting Hawks. Denver: North American Falconry and Hunting Hawks.
- b. Bent, A.C. Life Histories of North American Birds of Prey. Parts I and II. Dover Reprints.
- c. Birdwatching with Roger Tory Peterson. 1973. Washington, D.C.: National Wildlife Federation. (400 16th St. NW, Washington, DC 20036-2266)
- d. Black, G. 1992. Iowa Birdlife. Iowa City: University of Iowa Press.
- e. Clark, W.S. and B.K. Wheeler. 1987. Peterson Field Guide: Hawks of North America. Boston: Houghton-Mifflin.
- f. Craighead, J.J. and F.C., Jr. 1969. Hawks, Owls and Wildlife. New York: Dover Publications, Inc.
- g. Dinsmore, J.J., et al. 1984. Iowa Birds. Ames: Iowa State University Press.
- h. Dunne, P. 1989. Hawks in Flight. Boston: Houghton-Mifflin.
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- j. Ehrlich, P.F., D.S. Dobkin, and D. Wheye. 1988. The Birder's Handbook: A Field Guide to the Natural History of North American Birds. Simon and Schuster, Inc.
- k. Farrand, J. Jr., Editor. 1988. The Audubon Society Master Guide to Birding. New York: Alfred A. Knopf
- l. Harrison, H.H. 1975. Peterson Field Guides: Birds' Nests. Boston: Houghton-Mifflin, Company.
- m. Jackson, L.S. The Bald Eagle: Sea Bird of the Midwest. Des Moines: Iowa Department of Natural Resources. Nongame Program, 1436 255th St., Boone, IA 50036 or (515) 432-2823

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  - p. Welty, J.C. 1982. The Life of Birds. New York: CBS Publishing.
2. Medical Care and Rehabilitation
- a. Birds of Prey at the Vermont Raptor Center, -Display Environments for Permanently Damaged Birds. Woodstock: Vermont Institute of Natural Sciences. (Woodstock, VT 05091)
  - b. Cooper, J.E. 1978. Veterinary Aspects of Captive Birds of Prey. Saul, Gloucestershire: The Standfast Press.
  - c. Cooper, J.E. and A.G. Greenwood, Editors. 1981. Recent Advances in the Study of Raptor Diseases. W. Yorkshire: Chiron Publications.
  - d. Davis, J.W. et al, Editors. 1971. Infectious and Parasitic Diseases of Wild Birds. Ames: Iowa State University Press.
  - e. Fowler, M., DVM. Feeding & Nutrition of Animals in Rehabilitation Centers. IWRC Skills Seminar Packet, Session V.
  - f. Fowler, M.E. 1978., Restraint & Handling of Wild & Domestic Animals. Ames: Iowa State University- Press.
  - g. Fowler, M.E. 1978. Zoo & Wild Animal Medicine. W.B. Saunders Co. (This is a very expensive book. Chapter 14 deals specifically with raptors.)
  - h. Garcelon, D. and G. Bogue. 1977. Raptor Care and Rehabilitation. Walnut Creek: Night Owl Press. (Alexander Lindsay Junior Museum, 1901 1st Ave., Walnut Creek CA 94596)
  - i. Hayes, M.B. Rehabilitation Guidebook for Birds and Mammals. Troy: Brukner Nature Center. (5995 Horseshoe Bend Road, Troy, OH 45373)
  - j. Hoff, G.L. and J.W. Davis. 1982. Noninfectious Diseases of Wildlife. Ames: Iowa State University Press.
  - k. LeFranc, M.N., B.A.G. Pendleton, K.W. Kline, and DM. Bird. 1987. Raptor Management Techniques Manual. Washington, D.C.: National Wildlife Federation. (400 16th St. NW, Washington, DC 20036-2266, 1-800-432-6564, cost \$30.00)
  - l. McKeever, K. 1987. Care and Rehabilitation of Injured Owls. Beamsville: W.F. Rannie. (W.R. Rannie, Publisher, P.O. Box 700, Beamsville Ontario LOR 1B0 cost \$25)
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  - n. Pedig, P.T. Medical Management of Birds of PM. St. Paul: Raptor Center. 1920 Fitch Ave., St. Paul, MN 55108 or (612) 624-4745
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- p. Wild Animal Care and Rehabilitation Manual. 1991. Kalamazoo: Beech Leaf Press. Kalamazoo Nature Center, 7000 N. Westnedge Ave., Kalamazoo, MI 49007 or (616) 381-1574
  - q. National Wildlife Rehabilitators Association and International Wildlife Rehabilitation Council. Wildlife Rehabilitation Minimum Standards and Accreditation Program. National Wildlife Rehabilitators Association (NWRA), 14 N 7th Ave., St. Cloud, MN 56303 or (612)259-4086
3. Curriculum Resources
- a. Langefier, L. 1992. Wise As An Owl: A Resource and Teacher's Guide to Birds of PML A Peregrine Fund Publication. World Center for Birds of Prey, 5666 West Flying Hawk Lane, Boise, Idaho 83709 or (208) 362-3716
  - b. NatureScope: Birds! Birds! Birds! 1985. Washington, D. C: National Wildlife Federation. (400 16th St. NW, Washington, DC 20036-266)
  - c. Nebbe, L. Nature as a Guide: Nature in Counseling, Therapy and Education. Brighton: Iowa Wildlife Rehabilitators Association Publication #022. C/o Kathy Cuddeback Morning Star Farms, 153 5 280th St, Brighton, IA 52540)
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  - c. Fish Iowa! An Introductory Guide to the Fish of Iowa. 1989. Des Moines: Iowa Department of Natural Resources. Wallace State Office Building, Des Moines, IA 50319, (515) 281-5638
- 2. Medical Care
  - a. Carrington N. 1986. A Fish Keeper's Guide to Maintaining a Healthy Aquarium: Essential Advice on All Aspects of Aquarium Care. New York: Arco Publishing.
  - b. Dawes, J.A. 1987. A Practical Guide to Keeping Freshwater Aquarium Fishes. New York: Exeter Books.
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3. Curriculum
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- F. Mammals
1. Natural History
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  2. Medical Care and Rehabilitation
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    - e. Hayes, M.B. Rehabilitation Guidebook for Birds and Mammals. Brukner Nature Center, 5995 Horseshoe Bend Road, Troy, OH 45373
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    - g. Mammal Miscellany - A Collection of Rehabilitation Tools. Products, Catalogues, Book Sources. General and Species Specific Books, Technical Periodicals, Professional Societies, Organizations, and Publications. 1992. (Mrs. Roger W. Marcum, Wildwood Farm 14206 FM 2769, Leander, Texas 78641-9109, cost \$4.50)
  3. Curriculum
    - a. Nature Scope: Amazing Mammals. 1988. National Wildlife Federation. (400 16th St. NW, Washington, DC 20036-2266)

## Sample Program Outline

This program outline will need to be modified to match the specific audience.

### A. Definitions

1. Raptor - Latin, meaning to seize
2. Bird of prey is another name, means raptor is a predator
3. Adaptations common to all raptors
  - a. Hooked beak
  - b. Sharp talons
  - c. Strong feet
  - d. Excellent eyesight
  - e. Females larger than males

### B. Raptor numbers

1. 413 species worldwide
2. 49 species found in North America
3. 24 species can be seen in Iowa
  - a. 8 of these endangered in state
    1. red-shouldered hawk
    2. northern harrier
    3. peregrine falcon
    4. common barn owl
    5. burrowing owl
    6. Cooper's hawk
    7. bald eagle
    8. short-eared owl
    9. long-eared owl is threatened

### C. Raptor myths; symbols of old

1. Greek Goddess Athena – owl
2. Native Americans - eagle messenger to the spirit world
3. Ancient Egyptians wore vulture **chamis** for protection **not a word**
4. Falconry - certain classes of citizens could own certain birds for falconry

### D. Tions **Adaptations?**

1. Diurnal – daytime
2. Nocturnal - nighttime animal

### E. Groups of Iowa raptors, emphasize diurnal and nocturnal adaptations, use pictures & silhouettes

(each group has distinct wing and tail shape and hunting strategy)

**This** section can be modified to **match** specific program objectives by highlighting certain sections.

1. Vulture - broad wings, built for soaring, wings held in slight V or dihedral
  - a. Turkey Vultures - "TV look alive!"

- b. eats carrion, only raptor with a sense of smell
- c. cavity nester using large hollow trees in river bottoms, also crevices in limestone bluffs
- 2. Osprey - long, bent or "crooked" wings built for long flights and diving into water
  - a. Specialized fish eater, extra rough bottoms to feet, opposable third toe
  - b. Spring and fall migrant seen along river corridors
- 3. Accipiters - short rounded wing shape, long tail built for speed and maneuverability through woodland habitats
  - a. Eat mostly other birds
  - b. Have low tolerance to human disturbance - need large area of undisturbed woodland habitat
    - 1. Sharp-shinned hawk
      - a. considered extirpated as a nester in Iowa - possibly due to lack of detectability in raptor studies
      - b. seen as fall migrant
    - 2. Cooper's hawk
      - a. endangered in Iowa due to habitat loss and possibly lack of detectability in raptor studies
    - 3. Goshawk
      - a. winter visitor, Northern nester (MN, WI, Canada)
- 4. Harrier
  - a. long wings, long tail
  - b. built for low-level, **@ing** flights over open grassland or marsh area, often fly with the contour of the land
  - c. Prey mostly small birds and small rodents, some carrion
    - 1. Northern Harrier
      - a. endangered in Iowa due to loss of prairie and marsh habitat
      - b. ground nesting; susceptible to predation without large areas of habitat
- 5. Buteos or Hawks
  - a. broad wing and tail shape, with "fingertips" on wings;
  - b. built for soaring flight and "sit and wait" hunting style
  - c. Prey mostly mammals - but diet is highly varied
    - 1. Red-tailed hawk
      - a. most common buteo in Iowa - '**TR7**'
      - b. depend on edge habitat; including both woodland and grassland
    - 2. Red-shouldered hawk
      - a. endangered species in Iowa due to loss of lowland timber nesting habitat
    - 3. Broad-winged hawk
      - a. nests in Eastern and Southern Iowa woodlands
      - b. famous for forming large kettles (flock of hawks) during fall migration
    - 4. Rough legged hawk
      - a. winter visitor; nest in Canadian tundra
    - 5. Swainson's hawk
      - a. nests in Iowa, often nests further west, winter visitor
- 6. Eagles

- a. a much larger buteo shape
  - b. larger, longer wing span
  - c. built for soaring flights
    - 1. Bald eagle
      - a. eat fish, waterfowl, and carrion
      - b. federally endangered due to pesticides, lead poisoning, and human persecution
      - c. slow maturing - 5 years to adult plumage of white head and tail
      - d. successful nesting is on the rise in Iowa
    - 2. Golden eagle
      - a. prey mostly – jackrabbits
      - b. Western nester; winter visitor, seen often in Allamakee County
7. Falcons
- a. long swept-back, pointed wing jet plane wings,
  - b. squared-off tail
  - c. built for speed
  - d. Larger falcons eat mostly other birds; kestrel will also eat mice and insects
    - 1. American kestrel - once called sparrow hawk
      - a. North American falcon
      - b. common cavity nester in Iowa
      - c. interstate nest boxes
      - d. Iowa nest box study
    - 2. Merlin - once called pigeon hawk
      - a. medium sized falcon
      - b. extirpated as nester in Iowa
      - c. Northern and Western nester; winter visitor
    - 3. Peregrine - once called duck hawk
      - a. large falcon
      - b. federally endangered due to pesticides, mainly DDT
      - c. last nest (eyrie = cliff nest) in Iowa in 1965 near Waukon Junction in Allamakee County
8. Owls - unique, nocturnal hunters with special adaptations (large eyes, facial disc, fringed feathers, asymmetrical ears) separate owls from other raptor groups
- a. Prey mostly mammals although diet varies
    - 1. Short-eared owl
      - a. endangered species in Iowa due to loss of prairie and marsh habitat
      - b. ground nester
    - 2. Screech owl
      - a. common cavity nester;
      - b. Iowa nest box study two color phases - red and grey -appear to be about 50:50 in population and do not seem to be linked to habitat or sex
    - 3. Long-eared owl
      - a. threatened species in Iowa due to loss of conifer woodland habitat and nest disturbance
    - 4. Great-horned owl

- a. large owl
    - b. generalist predator; eats almost anything
    - c. nests in cavities and abandoned red-tailed hawk nests
  - 5. Barred owl
    - a. medium to large owl
    - b. cavity nesters in riparian habitats - called "hoot owl" or "rain owl"
  - 6. Barn owl
    - a. endangered species in Iowa due to Iowa being the northern edge of range and inability to compete with generalist species (GHO); also prey and habitat specific and need prairie and voles
    - b. cavity nester; Iowa release program
  - 7. Snowy owl-
    - a. arctic nesters
    - b. winter visitors
  - 8. Saw-whet owl
    - a. seen on migration and during winter
  - 9. Burrowing owl
    - a. endangered species in Iowa due to habitat needs of prairie dog tunnels for nesting; only appropriate habitat is in extreme NW corner of state
- F. Protection and Management
1. Problems and solutions
    - a. Pesticides
      1. restricted use
      2. DDT banned in US in 1972 - not yet banned worldwide
      3. alternatives to pesticides - Integrated Pest Management one example
    - b. Lead poisoning
      1. accumulates in the water environment
      2. hunting require the use of steel shot when hunting waterfowl
      3. Human persecution and disturbance
        - a. nest disturbance, poaching
        - b. It is illegal to harass, shoot, trap, take from the nest, or otherwise inconvenience a raptor.
        - c. All species of raptors are protected by both federal and state laws. The maximum penalties for killing a raptor can involve fines (\$10,000 for non-endangered species, \$300,000 for endangered species), revocation of hunting licenses, jail sentences, and confiscation of vehicles and firearms. T.I.P. 1-800-532-2020 to anonymously report an incident of someone shooting or intending to harm a raptor.
        - d. Exposed bait must be at least 20 feet from a trap
        - e. Raptors can not be kept in captivity without special state and federal permits.
    - c. Education
      1. When humans know and understand how important raptors are in our food web and their use as indicators of environmental quality, respect and protection will result. Raptors have larger home ranges than other birds; they require larger tracts of habitat for hunting and protection from

predation and disturbance. With 75% of the woodlands, 95% of the wetlands, and 99.98% of the prairie gone within the state, is it any wonder that of the 12 birds listed as endangered by the Iowa DNR - 8 are raptors?

G. Bring out live bird

1. Reinforce adaptations, natural history, identification
2. Equipment
3. Questions about bird

H. Other questions