

This Annex Suggests General Considerations and Best Practices for Emergency Animal Care in the Event of an Emergency or Disaster

ARE YOU READY?

- *When faced with an emergency, who provides care for the animals?*
- *How will triage be performed in the event of a catastrophic event?*
- *Which species have been prioritized for care following an incident?*
- *Who will be responsible for animal record-keeping in an emergency or disaster?*

Basic Steps When Writing and Implementing the Emergency Animal Care Contingency Plans

- 1. Conduct Preparation and Development**
- 2. Draft the Emergency Animal Care Section of the Contingency Plan**
- 3. Train Appropriate Personnel for Emergency Situations**
- 4. Schedule Trainings and Subsequent Evaluations**

Developing plans to care for animals during an emergency or disaster will increase the likelihood of a positive outcome. The species of animals, the nature and duration of the emergency will all necessitate that basic plans will need to be flexible and scalable. Ultimately, the goal is to maintain as safe and healthy environment as possible, provide food, water and care until the facility returns to a normal state, or until alternative housing and transportation can be arranged to move animals out if necessary. Remember, first responders such as police and fire departments will primarily be concerned about the health and safety of humans.

Depending upon the nature of the emergency event, a facility may have advance warning to plan the best course of action such as evacuate priority animals or better prepare for shelter-in-place.

A crisis without warning will require quick responses to activate the emergency animal care contingency plan. A well-written plan and regular training exercises will help avoid confusion and enhance the safety of animals, personnel and visitors.

□ **Conduct Preparation and Development**

Before drafting contingency plans for emergency animal care, the Facility Contingency Planners (FCPs) and/or stakeholders need to identify the current animal care practices. The following pages offer a variety of options to consider while evaluating and developing the contingency plan and training strategies.

- Identify the potential hazards. How would the occurrence of hazards impact the animals? See *Risk Assessment Annex*.
- Assemble a diverse planning team and collaborators who can advise on emergency situations, animal husbandry and veterinary practices in an emergency (see page3).
- Identify and evaluate the facility's protocols for animal care and wellbeing. Determine how they can be adapted to maintain a safe and healthy environment for animals during an emergency.

□ **Draft the Emergency Animal Care Section of the Contingency Plan**

After evaluating the current standard operating procedures and back up plans (1) draft or edit the contingency plan that includes strategies for maintaining a healthy environment for the animals, (2) monitor the progress of writing the plan and (3) develop a system for application of the plan. Best practice information for the following topics is provided beginning page 3.

- *Determine the General Protocols for Animal Care and Wellbeing*
- *Best Practices for Animal Care During Emergency Situations: Planning Considerations*
 - *Appendix I: Decontamination and Animals in Radiological or Nuclear Events*
- *Best Practice for Sheltering-in-Place During an Emergency*
- *Monitor the Drafting and Implementation of the Emergency Animal Care Plan*

□ **Train Personnel for Emergency Situations**

Develop the types of emergency preparedness exercises/drills for animals and personnel, and assess training effectiveness.

- Train personnel on procedures and their specific roles to maintain a healthy environment for the animals.
- Train personnel on their roles in emergency procedures, location(s) of equipment and other functions necessary to perform the tasks they are responsible for during an emergency or disaster situation.
- If possible, train priority animals to be responsive to commands that will be useful during an emergency, such as loading into a transport cage.

- Schedule Training and Subsequent Evaluations**
 - Once training material is created or identified, schedule training and emergency drills for appropriate personnel and volunteers and priority animals.
 - Evaluate the success of the exercises and modify the training, as needed. If an emergency occurred, was training adequate?
 - Revisit the plan as species, equipment, or other factors change.

The following considerations are good business practices that may be helpful for developing the emergency animal care plan. Contingency plans will vary depending on the species, size of the facility, available staff and other factors. Not every consideration is appropriate for every managed wildlife facility.

Stakeholders and Experts to Consult on Emergency Animal Care

- Who are the potential consultants and stakeholders?
 - Facility managers and owners
 - Veterinarians and technicians
 - Animal keepers and caretakers
 - Federal and local jurisdiction(s)
 - Local Emergency Management
 - Biosecurity consultants
 - Associations (AZA, AAZK, GFAS, AAZV, AVMA)
 - Species experts
 - State veterinarians

Determine the General Protocols for Animal Care and Wellbeing

The planning team should thoroughly understand the current standard operating procedures for their facility in order to draft plans for emergency animal care. Consider the following:

- Does the facility maintain an up-to-date inventory of all the animals? Are several copies available? **Conducting an inventory of animals after an emergency is extremely important.**
- In what format are the animals marked and identified?
 - Microchips
 - Ink tattoo
 - Tagging
 - Ear tags
 - Banding
 - Ear notching
 - Marking sticks/sprays
 - Radio frequency microchip (RFID)
 - Branding
 - Collar
 - Other
- What information is maintained in a permanent record? Who has access?
 - Registered Identification
 - Gender

Emergency Animal Care Annex

- Parentage
 - Photo
 - Type of ID marking/microchip #
 - Pre-existing conditions
 - Permanent medical records
 - Species background and physical features
 - Animal behaviors and level of danger
 - Recapture techniques for the species
 - Health risks to the animal
 - Potential zoonotic risks
 - Transportation recommendation
 - Other
- What information is routinely updated for each animal? How frequently is this information updated, and by whom?
- Age
 - Feeding schedule
 - Specialized diet
 - Health care
 - Behavioral idiosyncrasies
 - Training routine
 - Crate training (Type)
 - Enrichments
 - Current medications
 - Drug idiosyncrasies
 - Darting and euthanasia doses
 - Other
- In what formats are animal information retained and backed-up at a separate location? See Data Management Annex.
- Electronically
 - Hard copy
 - Clip board
 - Laminated waterproof card
 - MedARKS
 - Veterinarian's offices
 - Other
- Is the facility registered with U.S. Department of Agriculture or other regulatory agencies if applicable?
- What are the minimum amounts of water needed daily for the animals themselves? Are there seasonal fluctuations in water usage by the animals?
- What are the minimum requirements for foodstuffs for a day for the facility?
- What sort of inventory of food is kept on hand normally? How frequently is food delivered to the facility? Are there seasonal fluctuations in need? What foods must be kept frozen or refrigerated?
- What types of crates and crate-training equipment are kept on hand? Where? See Animal Transportation and Evacuation Annex.
- Are animals crate trained to enter crates, trailers, etc.?
 - Does the facility rely on borrowing or leasing/renting equipment for animal movement?
- Considerations for those with aquaria/ aquatic systems:
- Are closed system aquatic habitats closely monitored to maintain optimal conditions?
 - How long will each aquatic system operate as a closed system before animal survival is impacted based on species tolerance?
 - What type of system backups currently exist for aquatic life support systems?
 - Generators to run filtration systems

Emergency Animal Care Annex

- Source of clean water (could include private swimming pools)¹
- What routine Biosecurity protocols are in place to manage infectious or zoonotic disease issues?
 - What are the facility's disease prevention strategies?
 - What strategies are used to prevent interaction with feral wildlife?
 - Are newly acquired animals quarantined before introducing to resident animals?
 - What pest control is practiced at the facility? Are animal foodstuffs kept protected from wildlife, birds and domestic animals?
 - Are footbaths employed? When and where? Are they changed regularly?
 - What are the cleaning and disinfection protocols for the facility?
- What practices are used to protect the personnel from infectious disease or injury?
 - What are the facility's needs for appropriate personal protective equipment (PPE)? Are staff medically cleared and fit tested for respiratory PPE use as appropriate?
 - Have all appropriate personnel received the required or suggested immunizations, and are the immunizations up to date?
 - Are only designated animal keepers allowed to have contact with the animals to avoid possible transmission of dangerous bacteria and diseases from other personnel?
 - Are personnel injuries (including animal bites, scratches, etc.) recorded for appropriate follow-up?

The levels of veterinary services available to managed wildlife facilities differ greatly. This section does not intend to replace a facility's existing veterinary guidelines; rather, it is a reminder to FCPs that they should understand the availability of veterinary care under normal circumstances, and veterinarians should be consulted when drafting the Emergency Animal Care Plan.

- Is a veterinarian always on-site, on-call, or is a veterinary service contracted that is available 24-hours a day? How will this availability affect response capability?
- For ill or injured animals: how does the facility monitor the animals 'after hours'?
- Does the veterinarian(s) participate in all animal-related emergency drills and exercises?
- Are preventative healthcare examinations conducted regularly on all animals?
- Is there a baseline inventory for on-hand pharmaceuticals and other necessary veterinary supplies? Is there adequate anesthesia/sedatives on hand for all the necessary animals? Is there adequate darting equipment available? How are these supplies maintained and updated?²

¹ http://www.aphis.usda.gov/animal_welfare/downloads/marine_mammals/mmsterile.pdf

² If a contracted veterinarian provides animal health services, consult with the veterinarian to understand inventories they normally keep on hand, and the required timeframe for replacement pharmaceuticals. It may be necessary to request (and pay for) larger inventories of certain pharmaceuticals if the contract veterinarian does not maintain a sufficient inventory. Alternatively, a contract veterinarian may partner with other

- Is there a list of pharmacies, drug sales offices, vet clinics or hospitals that could provide a stockpile of necessary drugs on an emergency basis?
- Does the facility have a Veterinary Team or Emergency Animal Care Team that is designated to work alongside an Emergency Response Team as needed?

Best Practices for Animal Care During Emergency Situations: Planning Considerations

A facility should consider the health and safety of the people caring for animals under stressful conditions while drafting its contingency plans for appropriate care for animals in emergency and disaster situations. *These plans need not be exhaustive. Keep things simple. Plans may refer to the facility's standard operating guidelines or procedures, and elaborate on additional necessary steps.*

A facility's goals may be dictated by a 'priority' species. Prioritization may be based on scarcity of species, reproductivity, economic/cultural value, ability to transport, and risk of the species (zoonotic potential, level of threat to public, etc.). Resources may need to be targeted toward care, sheltering, or transportation of only specific species in extreme cases. Given the nature of the emergency, some species may be too large or impractical to move. These elements should be indicated in the plan, thereby simplifying decisions on care and possible transport during an emergency.

A facility may find it easier to organize their care plans for their animals, based on taxa. Several references exist which will assist the FCP teams in organizing their preparedness needs, by taxa. See "*Resources for Crisis Management in Zoos and Other Animal Care Facilities*" and the American Veterinary Medical Association's "*Emergency Preparedness and Response*" guide. This resource is available on the following site:

https://ebusiness.avma.org/EBusiness50/files/productdownloads/emerg_prep_resp_guide.pdf

General readiness considerations:

- Determine how the facility will take a 'head count' of animals after an emergency or disaster. Lists of animal inventories should be readily accessible for reference. Pictures of individual animals may aid in identifying them.
- Develop plans for capture and return of animals to safe enclosures if animals have escaped, or arrange transfers to other facilities, if applicable. Discussion about animal escape and relocation can be found in *Animal Incident Annex* and the *Animal Transportation and Evacuation Annexes*, respectively.
- Determine who will be responsible for performing triage should animal injuries occur. Ideally, a veterinarian or veterinary technician should assist in determining the health

veterinary professionals and request the use of items if needed. It is paramount that the planning team understand how readily available certain pharmaceuticals may be to their attending veterinarian.

status of animals. Perform triage and provide critical care for injured, ill or stressed animals as the circumstances allow.³

The art of Triage

Triage is the art of determining the medical priority of injured animals to increase the number of surviving animals. It requires a rapid situational assessment, with classification of patients to determine which should be treated first. It is important to note that the assessment is based on three key issues:

- What are the needs?
- What are the available resources? (equipment, personnel, time, etc)
- What are institutional priorities? (“priority” species as discussed above)

It is critical if possible, to have someone familiar with the facility’s resources and supplies assist with triage. Additionally, knowledge of materials and resources available *immediately adjacent* to impacted areas (neighboring veterinary clinics, ranches, etc) is extremely useful, as resources often become exhausted in a large response.

There are a number of references available on the internet to assist veterinarians and other animal care professionals in developing an orderly triage system for disasters or disease events. Ideally, a facility should familiarize themselves with the fundamentals of triage before an event occurs that requires it! An excellent resource is:

Wingfield WE et al. Veterinary Disaster Triage: Making Tough Decisions.

An adapted version is available on pdf form at:

http://public.health.oregon.gov/DiseasesConditions/CommunicableDisease/Veterinarians/Documents/anim_triage.pdf

- Determine the supplies a facility has available for animal emergency care response. What supplies are needed in an animal triage/field kit? What are the numbers of kits needed and who checks them regularly for completeness and component expiration dates? Where are the kits and other necessary supplies located?
- The facility’s primary veterinarian should consider calculating and charting appropriate euthanasia, sedation, and anesthesia doses for all animals (or species) **prior** to an emergency. This information should be available both electronically and hard-copy. See *Animal Incident Annex.*

³ Wingfield WE et al. Veterinary Disaster Triage: Making Tough Decisions

- Plan to keep logs for controlled substances up-to-date during the response. The amounts of controlled drugs, euthanasia solution use, etc. could be very difficult to recalculate and record after an incident. Designate appropriate staff to keep these records current during a response.
- Develop and maintain an up-to-date contact list of experts the facility would utilize in emergency care for the animals including any special vendors for necessary equipment or supplies. See MOU/MAA Annex.
 - If a facility's plan identifies offsite veterinarians or other professionals or organizations to assist in disaster management/recovery efforts, appropriate licensure issues should be addressed as part of that agreement.

Special Considerations: Decontamination

The need for decontamination of animals should be considered in the triage process to protect the animals, their human handlers and the working environment. Animals involved in emergencies or disasters may become contaminated with debris, chemicals, petroleum products, radioactive elements or biological agents. Ideally, decontamination should limit tissue damage and absorption, and prevents systemic poisoning (animals licking contaminated fur, etc.) and prevent secondary contamination to other animals, emergency responders and premises.

Note that most veterinarians and animal care personnel **DO NOT** have appropriate Hazardous Materials (HAZMAT) certifications to assess and decontaminate animals. It is extremely important to develop relationships with local emergency management professionals who may assist the facility to determine the likelihood of contaminant types via a Risk Assessment, and develop a decontamination plan. For more on Decontamination, see Appendix I of this document.

Biosecurity

Maintaining adequate biosecurity for animals and staff following an emergency or disaster will be challenging, but absolutely necessary to maintain animal health. Using the facility's existing safety protocols to protect against animal contamination and zoonotic diseases is ideal, but not always possible.

- A facility should inform and protect first responders about zoonotic disease concerns. Providing Safety Briefing Sheets to responders with 'must know' information about zoonotic disease concerns could help in emergency situations. See Animal Incident Annex for more information on Safety Briefing Sheets.
- Identify temporary quarantine areas for displaced animals, both domestic and wild, if applicable. Create a care plan for these animals that can be assigned to on-site personnel during an emergency.

- In an evacuation situation, follow safety procedures to protect against or mitigate animal contamination and zoonotic diseases.
- In a mass casualty event, carcass disposal needs are determined in cooperation with state and federal agencies.
- Determine alternative delivery protocols for goods and services. (e.g. in the event of a disease outbreak emergency, standard delivery may be impossible due to quarantine)
- For more information about biosecurity and infection control, the National Association of State Public Health Veterinarians has 2 documents available on the internet. *The Veterinary Standard Precautions Compendium* and *the Model Infection Control Plan for Veterinary Practices* provide infection control information that should be included in any Animal Care Plan. Find these resources at <http://www.nasphv.org/documentsCompendia.html>
- The Center for Food Security and Public Health at Iowa State University has an impressive catalog of resources on infection control, emergency response and other animal health related issues. Their homepage can be found at <http://www.cfsph.iastate.edu/?lang=en>

Best Practices for Sheltering-in-Place During an Emergency

Shelter-in-place: this term is used to describe a strategy for dealing with the care and sheltering of animals, e.g., within a facility that may be compromised by a natural or man-made disaster. Evacuation of the animals is discussed in the [Animal Transportation and Evacuation Annex](#).

A facility may plan to shelter its animals ‘in place’ meaning that animal movement may not be practical, or even possible, and on-site emergency animal care may be needed until such time when the facility is ‘back to normal’ or animals can be evacuated. Remember, behavior of the animals many change after a traumatic event.

- Will the plan call for the creation of a special Emergency Response Team (ERT) that would ultimately be responsible for staying on grounds in emergency situations? See [Administration Annex](#) for more information on ERTs. Which staff members would that be? Assign adequate personnel and back-up personnel to care for the animals. Depending on facility size and length of disaster, 2 separate Emergency Response Teams may need to be identified and trained, with the second team available to relieve the first after a number of days.
- Ensure that the positions for the Emergency Response Team are identified by job description
- Identify alternative holding areas within the facility. Is it feasible, and if so, how would movement be accomplished?
 - Consider the shelter-in-place locations that offer the best protection and conditions for each animal group. The temporary sites should safeguard both animals and personnel from danger. (consider hazards such as severe weather conditions, predators, etc)

Emergency Animal Care Annex

- Example: One Midwestern zoo contingency plan addresses the potential increased level of disease risk from wild birds by designating an indoor holding area for those species normally held in an outdoor pond. If a disease such as highly pathogenic avian influenza was a threat, a specific inside hallway is assigned to hold birds in temporary cages.
- When considering alternative areas for shelter-in-place possibility, consider the safety of both personnel and animals within the temporary shelter.
- Maintain some natural light, if possible. This may be especially important for some species to maintain adequate food intake.
- Evaluate the *feasibility* for assisting local emergency management by sheltering displaced animals, both domestic and wild, appearing after an incident.
 - Identify possible locations for a 'domestic animal-only quarantine-type area' for stray animals found and brought to the facility.
 - Consider the need for additional personnel, food, water, and safety while caring for these animals.
 - Describe the types of species and maximum number that will be accepted
- Identify ample quantities of food and potable water (or other necessary supplies as appropriate) for the different species to last a minimum of 72-hours, and preferably enough to last seven days as a year-round practice, if possible.
 - Consider a list of critical or high-demand items that should be on-hand or ordered in greater quantity before a forecast threat.
 - Note, that before significant weather events, greater amounts of hard-to-get items from regular vendors should be ordered and received, or try to stock enough to last seven days.
- Water may not be available from municipal supplies. How will water be potentially stored? Determine how supplies and water will be acquired, protected to prevent contamination, and also be mobile.
 - For instance, filled water vessels may be too heavy to lift and containers should be filled on a flatbed or cart. Water tankers and large temporary water bladders may be useful.
- Consider creating the following lists and attach to the Emergency Animal Care Plan. These should be easily accessible, in hardcopy form and updated regularly. Recommend that key personnel have these numbers in their mobile telephone directories.
 - A list of qualified personnel and local colleagues dedicated to animal rescue efforts, professional handlers, transporters or animal medical responders.
 - Contact list for food suppliers, pharmaceutical resources and equipment. Include current vendors as well as alternative vendors. MOUs will be helpful prior to an emergency.

Monitor the Drafting and Implementation of the Emergency Animal Care Plan

FCPs should monitor the progress of: (1) developing the Emergency Animal Care Annex; (2) drafting the plan; and (3) developing a system for application of the plan.

- Appoint someone to monitor the animal training program.

- Appoint someone to monitor the training of personnel.
- For effective follow up, establish a time table chart, or checklist, to complete the various elements of the Contingency Plan and the responsible person(s) or group.
- Post the Animal Emergency Care Contingency Plan in key locations and on the internal website, if applicable.

Training Considerations for the Emergency Animal Care Plan

Training and full-scale practice drills increase the likelihood of a successful and safe outcome for animals and their caretakers, and will reduce potential risks. The following considerations relate specifically to Emergency Animal Care. When developing training materials, scenarios and drills, consider also that the activation of an Emergency Animal Care Plan could mean catastrophic facility damage and potentially human injury. The types of training will be determined by the facility's capacity to respond and its recommended responses to an incident. See the [Training Annex](#) for more information on general training guidance.

Possible emergency and disaster training considerations for animal care staff may include:

- Consider conducting regular crate training exercises for animals, and practice moving animals (or empty crates) to an alternative on-site location to establish a temporary shelter.
 - Training may minimize the need for sedatives and excessive handling during an emergency.
 - Condition animals to manual injection. This may decrease stress during the process of sedation, if necessary.
- Conduct specific training for triage situations.
- Train on the techniques for animal search and rescue, (including technical animal rescue), and control/ capture for all species in residence and add to training routine. See [Animal Incident Annex](#)
- Consider media training for animal care staff. While it is recommended that an information officer handle all media requests for information, animal care staff should know who and how to direct journalists to the appropriate individual. (E.g. "Let me direct you to Karen Jones our Information Officer" sounds much better than "no comment".
- Specialized training courses exist for veterinary emergency situations and animal search and rescue. See the [Training Annex](#) for a list of specialized courses.
 - Disaster veterinary medicine and triage.
 - Hazmat awareness for veterinarians and other personnel
 - Animal decontamination
 - AVMA Veterinary Medical Assistance Team training

Sample Table-top Scenarios

Responses to emergency scenarios during a table-top exercise will vary depending upon the location of the 'incident,' time of day or night and the animals that might be involved. Develop and personalize multiple scenarios for discussions that reflect the facility's emergency animal care plan and potential challenges, based on the facility Risk Assessment. These could then be modified for drills and exercises. The following are sample emergency care plan scenarios. For more information on conducting tabletop drills, see the Training Annex. Tailor the tabletop to the unique species and features of the facility.

- ❖ Facility damage: The facility is shaken by an earthquake. Several of the animal habitats have been damaged, with two giraffe trapped in a barn with a roof collapse. There is some visibility into the barn, and the giraffe seem to be injured.
 - What steps should be taken immediately? What are subsequent steps to provide care for the animals?
- ❖ Infectious Disease: An outbreak of a disease occurs in a hoofstock herd the facility maintains in a mixed species exhibit. The contract veterinarian examines the animals, and determines that the signs of disease are consistent with a number of pathogens, one of which is a foreign animal disease, Foot and Mouth. Due to the concern, the veterinarian decides that he must immediately contact the State Veterinarian to rule out this pathogen.
 - What steps should be taken immediately? What are subsequent steps to provide care for the animals?

Schedule Training and Subsequent Evaluations of the Plan

- Schedule regular table top drills, training drills and exercises for all personnel and teams.
 - Include on-site veterinarian or contracted veterinarian in training exercises to become familiar with the Facility Incident Commander (FIC) activities.
 - Include the use of appropriate personal protective equipment (PPE) in each exercise/drill.
- After each table top, drill or actual incident, determine strengths and shortfalls or gaps and modify the emergency plan accordingly.
- Consider meeting regularly with animal caretakers from other institutions to discuss best practices for animal care in emergencies and mutual aid opportunities.
- Refine procedures and the plan as new equipment and drugs become available.
- Provide new animal-related personnel with emergency procedures as part of facility orientation.

- Specialized training could be offered to veterinarians and other animal care personnel for how to respond to animal health emergencies. See the [Training Annex](#) for more on this topic.

References

AVMA Emergency Preparedness and Response Guide. *American Veterinary Medical Association*.

<http://www.avma.org/disaster/default.asp>

AVMA Animal Health. *American Veterinary Medical Association*.

<http://www.avma.org/vmat/default.asp>

Baker, William K. 2007. "The Veterinary Role as First Responder to a Medical Emergency in a Crisis Management Situation." *Animal Keepers' Forum* Vol. 34, No. 11/12.

Community Emergency Response Team (CERT) Animal Response II. 2010.

http://www.citizencorps.gov/cert/training_mat.shtm

Chan, Susan D., William Baker, and Diana Guerrero. 1999. *Resources for Crisis Management in Zoos and Other Animal Care Facilities*. American Association of Zoo Keepers.

Hammond, Elizabeth E, DVM, and Daniel K. Maloney. 2007. "Hurricane Preparedness: Lessons Learned from Hurricane Katrina." *Animal Keepers' Forum* Vol. 34, No. 11/12.

Knight, Anthony. 2009. Elements of a Disaster Plan for Animals. In: Wingfield W and S Palmer, editors. *Veterinary Disaster Response*.

Lincoln Park Zoo Emergency Response Plan. 2010.

Livestock Emergency Guidelines and Standards. 2009.

Raffe, Marc. 2009. Pain Management in Veterinary Disaster Medicine. In: Wingfield W and S Palmer, editors. *Veterinary Disaster Response*.

FEMA. Disaster Assistance.gov. Business Emergency Plan. <http://www.ready.gov/>

Wingfield W and S Palmer, editors. *Veterinary Disaster Response*. 2009

Wingfield, Wayne E. and Jerry J. Upp. Veterinary Disaster Triage: Making the Tough Decisions.

<http://www.integratedtrainingsummit.org/presentations/2008/main_training_summit/course_2_7_-_veterinary_triage_-_wingfield_a_upp.pdf>.

World Health Organization. Zoonoses and Veterinary Public Health.

<<http://www.who.int/zoonoses/en/>>.

Appendix I

Decontamination

The goal of including decontamination information in these documents is **to raise the level of awareness** across zoological facilities about animal decontamination issues. This is an emerging field of study; with every incident such as Deepwater Horizon oil spill, and the Japanese earthquake, tsunami and nuclear reactor damage in early 2011, more is learned about decontamination issues and animals. The National Association of State Animal and Agricultural Emergency Programs (NASAAEP) has formed a best practice working group specifically tackling animal decontamination issues. Many of these best practices will be applicable to captive wildlife as well as companion and agricultural animals. These materials will be an important resource for FCPs and emergency response personnel in creating a decontamination plan.

Most veterinarians and animal care personnel **DO NOT** have appropriate Hazardous Materials (HAZMAT) certifications to assess and decontaminate animals. With the exception of uncomplicated debris or floodwater contamination, appropriate decontamination procedures must be identified by those individuals with HAZMAT or nuclear certifications. Depending on the incident, with appropriate instruction and PPE, facility personnel may be involved in some steps of a decontamination process.

There are a number of references available to assist FCPs in discussing a decontamination plan with emergency response personnel. A basic introduction by W.E. Wingfield; ***Veterinary Decontamination Procedures*** can be found at:

https://www.cseppportal.net/CSEPP_Portal_Resources/Veterinary%20Decon%20ProceduresWingfield.pdf

Another excellent resource by L.A. Murphy can be found in the book: ***Veterinary Disaster Response*** W.E. Wingfield and S.B Palmer, editors.

Animals in Radiological or Nuclear Events

General Considerations for nuclear incidents

As discussed in the ***Administration Annex***, an incident may occur due to accidental or intentional release of nuclear material. Best practices for protection of humans are

discussed in that annex. To determine if a facility should consider preparing itself for a possible radiological or nuclear incident, meet with local emergency responders and other stakeholders to assess the risk of nuclear incident occurring within or near the facility. Consider the location of nuclear power plants, and the location of the facility. Criminal activity risk should be assessed by facility. High profile entertainment venues may be more at risk for criminal activity than small, isolated facilities.

In general, Chernobyl and other incidents have shown us that animals can take higher doses of radiation than humans. As information is gathered, the Japanese nuclear incident of 2011 will yield more lessons learned. Protection of human life and health is the primary objective in a nuclear incident, and this information is merely provided to increase the knowledge about nuclear issues across the community.

- A nuclear incident will probably be a large scale response that involves **many** jurisdictional authorities (local, state and federal responders). This type of incident may involve the need for sheltering-in-place the personnel and visitors who may have been trapped on facility grounds. (See *Administration Annex* for more information about choosing the best buildings for sheltering after a nuclear incident.

Improvised Nuclear Device or Dirty Bomb: Nuclear Incidents for which there is little time to prepare

- There are several types of nuclear incidents. A nuclear detonation may be due to:
 - Improvised Nuclear Device (IND):** causes a sudden release of nuclear material, with catastrophic infrastructure damage, with generally no warning, such as a nuclear attack. This is a low incidence, extremely high consequence hazard. (See *Risk Assessment Annex*)
 - 'Dirty' Bomb:** is a sudden release, with low to medium infrastructure damage, +/- warning time. Generally, lower magnitude of radioactivity than an IND
- Since it is likely that these types of incidents will happen suddenly and without warning, there may be little time to prepare the animals to decrease potential exposure. If personnel and guests are trapped on zoo grounds after an incident, it is likely that sheltering-in-place for a minimum 48 hours will be recommended (See *Administration Annex*). *After 48 hours, the following may happen:*
 - Officials – radiological and other responders – will come and provide instructions.
 - You may be instructed to leave food and water for the animals.
 - It may be okay to take small endangered species in cages, as possible. Decisions will vary.
- The greatest danger from fallout is from inhalation and ingestion. Avoid contact with the body. Fallout can be removed from animals by washing under the direction of HAZMAT, radiologic responders and/or Department of Energy instruction.

Plume or cloud distribution: Nuclear Incident that may provide more time to prepare

Emergency Animal Care Annex

- ❑ **Plume or cloud distribution:** May have warning such as in a reactor leak or plume of any sort coming from a distant source. This is often a prolonged release; with little to no infrastructure damage. Civil Defense agencies will announce the warning.
- ❑ If possible, shelter animals indoors to avoid the fallout. Turn off ventilation systems that bring in outside air. Do not tape windows and doors as the most dangerous particulate fallout will not seep in; it could be risky to make sheltering space so completely airtight as to risk asphyxiation of the occupants.
- ❑ If possible, keep any stored human or animal food and water covered, in a safe area and free from fall out contamination.
- ❑ If there is sufficient time after a plume warning, visitors will most likely leave the facility. However, if for some reason, visitors cannot leave, plan on the need for a minimum of 48 hrs of sheltering as above.

Under direction of Nuclear Regulatory Commission (for release from a nuclear power facility) radiation physicists, and other experts, the following steps may be implemented to allow for continuing care of the animals. None of these steps should be undertaken by any staff without consultation with and monitoring by the nuclear responders:

- ❑ Certain levels of radiation may be acceptable after evaluation of levels. 'Stay times' will be calculated and may be 2-3 hours a day if it is necessary to feed animals.
- ❑ Cover faces with N-95 face mask if going out of the shelter area.
- ❑ In the limited body of scientific evidence for most radio nuclides, hosing the animals off to rid them of fallout is a possible option. Take care to control the wastewater to avoid contamination of other animals, personnel and the facility.
- ❑ Dampen ground with water to reduce particulate resuspension, as possible.

For further information:

FEMA. Are You Ready? Nuclear Blast.

http://www.fema.gov/areyouready/nuclear_blast.shtm

FEMA. Radiation Safety in Shelters.

<http://www.survivalunlimited.com/nuclearprotection/femasafety.htm>

National Security Staff Interagency Policy Coordination Sub Committee for Preparedness & Response to Radiological and Nuclear Threats. "Planning Guidance for a Response to a Nuclear Detonation"

http://www.hps.org/hsc/documents/Planning_Guidance_for_Response_to_a_Nuclear_Detonation-2nd_Edition_FINAL.pdf