This Annex provides the Facility Contingency Planners (FCP) guidance for conducting a risk assessment of the facility. A thorough risk assessment is a necessary, vital step for contingency planning. Some components may not be applicable for every facility, but this Annex is intended to offer a broad perspective of considerations.

Basic Considerations for Assessing Potential Risks

- **It is impossible to list all potential hazards.** A risk assessment will identify which hazards are most likely to occur.
- A **critical and through risk assessment** is essential to adequately plan for the safety of personnel, animals and the facility.
- It is vital to include **public safety experts and partners** such as Police, Fire Departments, and local Emergency Management in the evaluation of hazards. This is extremely important for public venues.
- **Members of professional organizations** such as the Association of Contingency Planners and. The Small Business Administration could be valuable to assist the FCP in contingency planning.
- **Risk assessment templates** are available that can be adapted to suit the individual needs of the facility (beginning page 7 find four samples). These templates can also be used to prompt discussion within the planning team.

How will a Risk Assessment Help to Develop Contingency Plans?

A Risk Assessment will:

- **Identify hazards.**
- **Determine the probability (likelihood) a particular incident will occur.**
- **Determine the facility's vulnerability to a given hazard.**
- **Thoroughly examine the consequence(s) to a facility if a given hazard occurs.**

Hazard + Vulnerability + Likelihood + Consequence = RISK

Plan for what is likely to happen!

The Process

1. **Assemble a Team of Stakeholders, Experts and Partners**

The Facility Contingency Planner (FCP) should assemble a team to assist with the risk assessment. Experts and professionals will be tremendous assets while evaluating probable hazards, vulnerability, the likelihood of an occurrence, and any potential consequences. Consider the following list of people or organizations that could be part of your planning team:

- **Management, staff** and other stakeholders can provide valuable first-hand information.
- **Local and State stakeholders** can provide professional expertise on the area and expectations and limitations.
  - Fire/police/EMS/Public Works/utilities
    These groups will help identify local codes and regulations such as OSHA, environmental organizations, Fire codes, zoning regulations, all which may play a role when developing individual plans. Police and Fire officials are often happy to walk through a facility and assist with a risk assessment from their professional perspective.
  - Emergency medical personnel
  - State wildlife agencies
  - State agricultural departments
  - County Extension offices
  - Animal Control agencies
  - Local Emergency Management experts
  - SART programs (State Animal/Agricultural Response/Resource teams)
  - National Alliance of Animal and Agricultural State Emergency Programs
- **Key non-governmental stakeholders** who are well known to the managed wildlife community can provide valuable input related to animal issues and emergencies.
  - Association of Zoos and Aquariums
  - American Association of Zoo Veterinarians
  - American Association of Wildlife Veterinarians
  - Global Federation of Animal Sanctuaries
  - National Wildlife Rehabilitators Associations
  - Association of Reptilian and Amphibian Veterinarians
  - Zoological Association of America
  - Exotic Wildlife Association
  - American Association of Zoo Keepers
  - Association of Avian Veterinarians
  - Association of Exotic Mammal Veterinarians
  - National Animal Rescue and Shelter Coalition
- **Additional partners** provide an alternative informational source related to equipment or other resources (e.g., stock trailers) and expertise.
  - Veterinary practices, associations or veterinary schools
  - Livestock associations

- 4-H or Future Farmers of America programs, particularly in rural areas
- Equestrian organizations
- Local animal welfare organizations
- Dog sled racing organizations
- Pet service industry organizations (kennels, groomers, etc.)
- Chambers of Commerce
- Private sector entities with animal-related missions and resources, such as nearby zoos, sanctuaries, ranches, etc.
- American Red Cross
- Neighboring businesses

Determine a method for constructing the risk assessment. Some facilities use a narrative description, others use a scoring system that 'add up' potential risks. Another tool asks the planners to consider 'low', 'medium' or 'high' likelihood of occurrence, with critical planning focused on the 'high' likelihood.

The assessment's format is not important. What is important is that the planning team develops a list of hazards that are likely to occur, then discusses how these hazards might impact the facility.

Following are lists of potential hazards for consideration; however, reflect also on any additional hazards unique to the location or structure.

2. Identify Hazards

- ☐ What are **known hazards?** Consider hazards that have occurred historically. Research floodplain maps, earth quake zones, etc. Consider the following:
  - Flood
  - Tsunami
  - Drought
  - Wildfire
  - Structural fire[1]
  - Earthquake
  - Landslide
  - Volcano
- ☐ What are **typical weather hazards** in the area? What are the extremes?
  - Snow/blizzards
  - Rain/hail
  - Heat waves
  - Extreme cold snaps
  - Ice storms
  - High winds
  - Dust/sand storms
  - Tornados/micro bursts
  - Hurricanes/tropical storms
  - Other
- ☐ What **'human caused' hazards** could affect the facility? Besides what could happen on facility grounds, consider nearby businesses and the potential hazards they pose.

[1] Fire is the most common of all business disasters. www.ready.gov/business/plan/planfiresafety.html

- Chemical plant (spills, water contamination, explosion, fire)
- Nuclear plant (contamination issues, explosion)
- Oil rig/pipeline issues (spills from pipelines or contamination of supply for aquaria)
- Proximity to a railway or interstate where hazardous chemicals may pass by
- Functional threats (strikes or labor dispute in the public sector)
- Criminal activity and terrorism

- What **hazards are associated with on-grounds storage of various materials**?
  - Fuels, diesel, propane, motor oils, etc.
  - Paints, solvents, cleaners
  - Pharmaceuticals, medications, anesthetics
  - Laboratory reagents (acids, bases, etc.)
  - Ammunition
  - Fertilizers (nitrates)
  - Agricultural chemicals/pesticides
  - Chemical filtration products (chlorine, etc.)
  - Disinfecting agents (bleaches, etc.)

- What **animal-specific hazards** are associated with different species at the facility?
  - Venomous species (any risk due to vertebrate or invertebrate with toxin-producing species should be noted)
  - Large dangerous carnivores or hazards associated with the handling of large animals in general
  - Non-human primates
  - Zoonotic diseases
  - Animal escapes

3. Determine the Likelihood a Hazard Will Occur

A facility's list of probable hazards **SHOULD** be lengthy. Evaluate each hazard and determine the likelihood that a particular incident WILL happen. ***The hazards 'most likely' to occur should be addressed in the contingency plans*.**

- Discussing the hazards with the stakeholders will help in determining the likelihood of occurrence. For example:
  - Police officers can conduct an assessment of the facility to determine the likelihood of various criminal activities.
  - Fire departments conduct assessments to look at the likelihood of fire.
  - Utility companies can provide locations of gas pipelines, and other equipment to determine the likelihood of ruptures, and other types of hazards.
  - Weather histories can be studied for likelihood of tornado, hurricane, and other related weather hazards.
  - Chamber of Commerce or similar organizations can provide information on neighboring businesses. This information would be valuable to determine the likelihood of a community emergency for various chemical spills, or other human-caused hazards.

- Concentrating on the likely incidents first can help with prioritizing. In many cases, the response actions are similar for the many threats. See examples below on page 5 and 6.

4. **Determine the Facility's Vulnerability to a Given Hazard**

   - Vulnerability describes *how* susceptible the facility is to a given hazard. For example, two facilities in a similar area determine that high winds are a hazard, and have a high likelihood of occurring. The facility with several glass conservatory-type exhibits is more vulnerable than a facility whose buildings are made of concrete block.

5. **Thoroughly Examine the Consequence(s) to a Facility if a Given Hazard Occurs**

   - If a particular hazard actually occurs, what potential consequences might affect the facility? For example, a hurricane could cause the following consequences: loss of animal life, flooding, hazardous materials spills, communication outages, short-term closure for cleanup, loss of revenue, closed access roads to and from the facility, key vendors unable to reach facility.
   - It may seem 'silly' to thoroughly discuss consequences of a given hazard; these often seem intuitive. However, it will be impossible to draft robust plans engaging all stakeholders if the planning team doesn't understand all potential consequences.

After the appropriate planning team has discussed (1) potential hazards, (2) the likelihood of an occurrence, (3) the facility's vulnerability and (4) the potential consequences from a hazard, the team is ready to prioritize those hazards which should be addressed first. *Planning teams will discover during their discussions that many of the responses are the same, regardless of the type of hazard.*

Examples of Risk Assessment

The following are examples of the risk assessment process. While these examples are simplistic, they show how responses to incidents can be broken down into discrete tasks and when organized together, provide a framework to respond to an incident.

Example 1

The planning team for John Doe Zoo has identified ice storms as a potential hazard to the zoo. Research and experience inform the planning team that a storm occurs every 3-4 years and overhead power lines have snapped. Therefore, the facility is *quite vulnerable* to an ice storm due to the overhead power lines that run to each building. The likelihood that an ice storm will occur again is high. The *consequence* of an ice storm could include loss of electrical power, road closures and the inability for key personnel to get to the zoo to care for the animals.

The planning team determines that contingency plans should address: 1) a communication system that will keep employees informed and updated on conditions as needed, 2) loss of power, 3) road closures and 4) sheltering personnel on grounds to care for the animals' needs short-term (creation of a Response Team).

Example 2

The planning team for John Doe Zoo also has identified tornadoes as a potential hazard. The facility has several buildings of concrete and steel construction. The zoo itself has never experienced a tornado and they are not at all common, but have occurred in the area. The planning team determines that the facility is *somewhat vulnerable* to the effects of a tornado. They also determine that there is *low likelihood* of a tornado affecting the facility. The *consequence* of a tornado could include loss of power due to the overhead power lines, and the inability for adequate personnel to get to the zoo to care for the animals.

The planning team determines that contingency plans should address: 1) a communication system that will keep employees informed and updated on conditions as needed 2) loss of power, 3) road closures and 4) sheltering enough staff on grounds (creation of a Response Team) to care for the animals' needs short term.

Example 3

The planning team for John Doe Zoo has identified that robbery of the facility's Gift Shop is a potential hazard. Planning team members from the local police department and the facility's management explain that in the last 20 years, the gift store has been robbed twice, and one incident involved a fire arm. The planning team determines that the facility is *vulnerable* to a robbery, and while the *likelihood* of a robbery is low (2 incidents in 20 years) *consequence* of a robbery is potentially quite high in terms of danger to employees and guests.

The planning team determines that contingency plans should prepare the facility for 1) a communication system that will keep employees informed and updated on conditions as needed and 2) a strong communication plan with the local police department.

These simple examples reiterate an important point: Contingency plans can and should be written to address multiple scenarios. John Doe Zoo will write plans that address emergency communication and how to respond to power losses of short-term duration. These same plans could be used also for ice storms, tornados, or other emergencies. Additionally, a Response Team will be created to address the need for a crew to remain on grounds and manage the emergency, regardless of the cause.

Following are sample templates or guidelines that may help with the Risk Assessment process.

Risk Assessment Template 1 provided by Mark Lloyd, DVM Institutional Disaster Preparation and Response, Wildlife Conservation, Management and Medicine, Humane Society of the United States.

Risk Assessment Template

DISASTER PLANNING
CAPTIVE WILDLIFE AND REHABILITATION FACILITIES

Assess Risks > Generate Needs List > Create Plan > Train to the Plan > Implement Plan

Institutional Risk Evaluation: The First Step

Mark Lloyd, DVM, Medical Director, Emergency Services

PLEASE DEFINE RISKS AS PRECISELY AS POSSIBLE

Facility Identification _____ Date _____

Completed by _____ Reviewed by _____

Institutional Risk Evaluation

What are the Specific Risks for each Specific Institution must address?
What Risks are Most Likely based on Geographic Location?
What Animal Health and Species Specific Risks exist?
What Species Specific Liabilities exist?
What Liabilities exist for Sheltering in Place?
What Structural Risks/Liabilities exist at the facility?
What Humans Health Risks and Liabilities Exist?

Geographic Risks

Fire	Regional Fire Risk Low 1-2-3-4-5 High	Facility Fire Risk	Other	
Tectonics / Tsunami	Proximity to Known Fault Lines (miles)	Recent Quakes Date and Richter Rating		
Coastal Proximity	Distance to Coast (miles)	Height Above Sea Level (feet)		
Meteorological – Weather	Flood Zone (specify: coastal, river, below damn, levee, etc.)	Height Above /Below Water Table (inland)		
Heat/Cold	Winter Storm Risk Low 1-2- 3-4- 5 High	Record Min and Winter Temp Range		
	Summer Heat/Drought Risk	Record High and Summer Temp Range		

Chemical Exposure Potential Risks	Chem. Transport Proximity – Distance	Chemical Types (chlorine, nitrogen fertilizer, fuels)		
Train/Rail	Distance to Railway	Known Chemical Transport		
Interstate	Distance to Interstate	Known Chemical Transport		
Harbor/Port				
Petroleum Specific Risks	Closest Petroleum Facilities	Specify: pipeline, refinery, well, storage, port, etc		
On site Chemicals Haz-Mats	Fuels	Fertilizers	Other	
	Pesticides	Herbicides		

Animal Health Risks

Species Specific Risks	Avian Victim or Vector species (A.I., New Castles, etc) poultry species, ducks/geese	Hoof Stock Victims or Vectors (FMD, blackleg, etc)	Carnivores (canids, felids, bear)	
	Temperature Sensitive Breeds/Species	Species Difficult to Quarantine		
Water Storage	Water Requirements (gal/day)	Water Storage Capacity		
Avian				

Hoof Stock				
Carnivores				
Other Species				

Animal Nutrition Risks

Food Storage Requirements	Food Types required per day (dry, hay, milled feed)	Food Storage Requirements (dry storage, refrigeration, Frozen, etc)	Storage Capacity (days of full rations)	
Milled Feed				
Forage				
Carnivore Diet				
Fresh				
Specialized (prey items,milk replacer)				
Food Re-supply Chain	Current Transportation (direct wholesale - staff transport, commercial refrigerator truck, etc)	Alternate Transportation available	Special transport equip required (refrigerated, wet silage)	
Milled Feed				
Forage				
Carnivore Diet				
Fresh				

Facility Structural Risks

Life Support Systems	Water Source and Systems	Air Flow HVAC	Sewage Treatment/Handling	
Fuel required (electrical, natural gas, fuel oil, etc.)				

Buildings/Enclosures	Animal Enclosure Integrity	Staff Structures	Storage Facilities	
Communication	Hard Lines (phone, cable)	Satellite Phone	Cellular Phone (recharge capabilities)	
Broadcast Information Access / Public Emergency Information Source	Television Connections (antennae+adapter, cable, satellite)	Radio Types (A.M., F.M. Weather Alert Radio)	Internal Communications/ Staff Radios (recharge requirements)	
Backup Animal Records	Hard Copies in Waterproof Container	Digital Backup Offsite		

Animal Management Equipment

Fuel Storage Supplies	Diesel	Gasoline	Propane	
Electrical Generator	Fuel Type	Kw/Hr Output		
Fuel Requirements	Truck #1	Truck #2	Personal Vehicle	
Vehicular miles/gallon				
Minimum Vehicular miles/day required				
Total Gal per Day				
	Tractor	Other vehicles	Electrical Generator Gallons / Hour	
Vehicular miles/gallon				
Minimum Vehicular miles/day required				
Total Gal per Day				
Ballistic / Lethal Weapons	Rifles	Shotguns	Handguns	

Available Veterinary Care	Closest Veterinarian	Veterinary Contact Info Posted Locations		
Transport Container Requirements	Species Specific Requirements	Animal Inventory total	Total Crate/Transport Cages required for evacuation	
Avian				
Hoof Stock				
Carnivores				
Rabies Vectors				
Other				
Animal Transport Vehicles Available On site	Enclosed	Open Trucks	Trailers	
Vehicles Required to Remove All Animals	Enclosed	Open truck	Trailers	
Animal Transport	Existing Contractor	Transporter Name	Other Outside Resources (other farms/suppliers)	
Avian				
Hoof Stock				
Carnivores				
Rabies Vectors				
Other Species				
Restraint Equipment Required	Nooses, Gloves	Snow/Temp/Construction Fence (ft)	Squeeze Chutes	
	Rigid Panels	Livestock Chutes	Avian Transport Crates	
Restraint Equipment Available	Halters	Temp Fencing	Other	
	Rigid Panels	Push Boards	Squeeze Chutes	

Human Health: Staff and Public Safety

Potential Liabilities

Species Specific Risk / Liability to Human or Animal Health	Dangerous Animals (Lg. Carnivores, venomous)	Large Predatory Birds	Rabies Vectors	
Escape	Number of Routes	Offsite Rally Location		
Staff Support	Backup Payroll/Finance in Disaster	Family Shelter	Other	
	Staff Records Off Site			
Human Life or Health Risk	Closest EMS	Closest Hospital	Other Emergency Centers	
Environmental Risks	Thermal Risk Hyper/ Hypo thermia	Dangerous Local Wild Species	Other Human Hazards	
Humans Sewage Facilities	Municipal	Onsite	Portable	
Hazardous Materials On site	Animal Feces Storage	Pesticides	Herbicides	

Shelter in Place

Staff Requirements	Minimum Daily Staff Required	Housing Required	Meals Required for 7 days	
Husbandry Staff Required				
Logistics/Ops Staff Required	Animal Transport Drivers	Feed Transport	Staff Transport	
Personnel Water	Water Required @ 5 gal / person / day for 7 days (gal)	Potable Water Storage Capacity (gal)	Water Sterilization Methods Available (chlorine, iodine, micro-filtration, other)	
Water Contamination Potential	Onsite Potable Well/Spring	Municipal Water	Sewage Treatment Onsite or Municipal	
Energy Requirements	Electrical Grid above or below Ground	Most Critical Electric Systems (well pump, heat, cool)	Other	
Electrical Usage	Total Facility Use / Day (Kw per Month on Bill divided by 30 days)	Animal Areas Kw/day	Staff Areas Kw/Day	

DISASTER PLANNING
Institutional Risk Evaluation Continued

- PLEASE PROVIDE ANY AND ALL ADDITIONAL UNIDENTIFIED RISKS
- PLEASE EXTEND PREVIOUS ANSWERS WHICH PROVIDED INSUFFICIENT SPACE ABOVE
- PLEASE DESCRIBE WELL TO INSURE COMPLETE EVALUATION FOR MITIGATION DESIGN
- USE AS MANY ADDITIONAL PAGES OR SUPPORTING INFORMATION AS APPROPRIATE

Risk Category	General Liability or Risk Description	Specific Risk Description	Other related Information	

Risk Assessment Template 2

Red Cross Hazard Assessment Guide

Red Cross works hand-in-hand with Members (free) to guide them through the steps of preparedness. Members also can conduct free assessment on-line.

This exercise can help you record information about your facility's capacities and vulnerability to a variety of emergencies and hazards.

1. Make a list

Identify all possible emergencies that may impact your business. To make sure your list is comprehensive, meet with government agencies, community organizations and utility companies. These groups can help identify potential emergencies and hazards. Emergencies can range from power outages, weather events, to hazardous spills.

2. Estimate probability

Rate the likelihood of each emergency's occurrence. Use a 1 to 5 scale with 1 as the lowest probability and 5 as the highest. These can include proximity to dams, large facilities, flood plains, and nuclear power plants for example. This is a subjective consideration, but it is useful for prioritizing and planning.

3. Assess the human impact

Analyze the potential human impact of each emergency on your list—the possibility of death or injury. Use a 1 to 5 scale with 1 as the lowest and 5 as the highest.

4. Assess the impact on your facility's property

Using the same 1 to 5 scale, evaluate the potential impact on your facility's property (physical construction, storing combustibles, and building locations, for example) for each emergency on your list. Consider:

* Cost and time needed to replace
* Cost and time needed to set up temporary replacement
* Cost and time needed to repair

5. Assess the impact on your business operations

Using the same 1 to 5 scale, evaluate the potential impact of each emergency on your day-to-day business operations. Some scenarios to consider:

* Employees are unable to report to work

* Customers are unable to reach facility
* Critical supplies cannot be delivered
* Product distribution is interrupted

6. Assess internal and external resources

Using the same 1 to 5 scale, evaluate the potential impact of each emergency on your internal and external resources. Ask yourself:

* Do we have the needed resources, equipment and capabilities to respond?
* Will external resources be able to respond to us for this emergency as quickly as we may need them, or will they have other priority areas to serve?
*Do we have training and drills; is training included in new hires orientation?

Risk Assessment Template 3

Michigan State University
[Unit] Vulnerability Analysis Chart

A Vulnerability Chart can be completed for a physical location or for each critical system/function. The totals will indicate high areas of vulnerability. The form may be modified to rank vulnerability as high, medium, and low, instead of a numerical ranking system. Using a numerical rating, your most vulnerable areas will be those with the highest total.

Type of Disaster	Human Impact	Property Impact	Business Impact	Internal Resources	External Resources	Total
	5 High Impact - 1 Low Impact			5 Weak - 1 Strong		
Loss of AC Power						
Loss of Environmental Controls						
Flood						
Tornado						
Fire						
Electrical Storm						
Breaches of Security						
Interruptions of Internal Communications						
Interruptions of External Communications						
System Hang-up or Shutdown						
Degradation of Performance						
Irrational Data Presented to Users						
Files Corrupted or "Lost						
AC Power Spikes						

Risk Assessment Template 4

FEMA[2]

Learn about the hazards that may strike your community, the risks you face from these hazards, and your community's plans for warning and evacuation. You can obtain this information from your local emergency management office or your local chapter of the American Red Cross. Space has been provided here to record your answers.

Hazards

Ask local authorities about each possible hazard or emergency and use the worksheet that follows to record your findings and suggestions for reducing your family's risk.

Possible Hazards and Emergencies	Risk Level (None, Low, Moderate, or High)	How can I reduce my risk?
Natural Hazards		
1. Floods		
2. Hurricanes		
3. Thunderstorms and Lightning		
4. Tornadoes		
5. Winter Storms and Extreme Cold		
6. Extreme Heat		
7. Earthquakes		
8. Volcanoes		
9. Landslides and Debris Flow		
10. Tsunamis		

[2] http://www.fema.gov/areyouready/getting_informed.shtm

11. Fires		
12. Wildfires		
Technological Hazards		
1. Hazardous Materials Incidents		
2. Nuclear Power Plants		
Terrorism		
1. Explosions		
2. Biological Threats		
3. Chemical Threats		
4. Nuclear Blasts		
5. Radiological Dispersion Device (RDD)		

You also can consult FEMA for hazard maps for your area. Go to www.fema.gov, select maps, and follow the directions. National hazard maps have been included with each natural hazard in Part 2 of this guide.