



# FLOODING & LIVESTOCK OWNERS

Preparing, Responding, and Recovering



**UC DAVIS**  
VETERINARY MEDICINE  
*Center for Equine Health*



**UC DAVIS WIFSS**  
Western Institute for  
Food Safety & Security

# FLOODING & LIVESTOCK

## Preparing, Responding, and Recovering

**Flooding is the most common and costly disaster experienced by U.S. citizens. For livestock operations, structure damage and the loss of feed, animals, and genetic potential can be financially crippling. Flooding can also be a personally dangerous time for ranchers and their employees. Six inches of moving water can topple an adult and as little as 12 inches can sweep a vehicle off the road. This pamphlet describes actions livestock owners can take to prepare, respond, and recover from flooding events.**

## PREPARE

### ▶ **KNOW YOUR FLOOD PLAIN**

Use the property's history and FEMA mapping (on page 7) to determine if your livestock's housing or pastures will likely be affected by the flooding. Flood maps can also be used to determine which evacuation routes are likely to remain open.

### ▶ **CREATE YOUR OWN FARM DISASTER PLAN**

The plan should include details for either evacuating your livestock or implementing "shelter-in-place." Evacuation destinations frequently used are county fairgrounds, local auction barns, and nearby ranches located at a higher elevation. Your county's Office of Emergency Management or local livestock organizations may be used to coordinate transportation and sheltering resources (see the "Case Study" on page 6).

### ▶ **ENSURE ACCESS TO EMERGENCY INFORMATION**

Make provisions to monitor flood and weather conditions that don't depend on grid electricity. Accurate news sources may include your county's Office of Emergency Management websites and NOAA radio broadcasts.

### ▶ **IMPROVE YOUR FACILITY'S FLOOD RESISTANCE**

Improve storm drainage to limit inundation of critical areas. When possible store feed, seed grain, fertilizer, pesticides, and other commodities at higher locations. Elevate furnace, water heater, and electrical panels if they are susceptible to flooding. Following floods in 1997 and 2007, some Oregon dairy farms created elevated pads to more easily allow cattle to shelter-in-place.

### ▶ **SECURE CRITICAL RECORDS**

Have copies of important legal, financial, and breeding records in a waterproof and fireproof box that is readily available during an evacuation. A better solution is to keep digital copies stored on a secure cloud-based server. Include photographs and video of insured property for later claims.

### ▶ **EMPLOY VACCINATION**

Your veterinarian may recommend vaccination of pastured animals against diseases associated with flood-prone areas such as blackleg, anthrax, leptospirosis, and swine erysipelas.



# OWNERS

## ► PROVISION FOR EMERGENCY POWER

Have well maintained backup generators for critical livestock production operations, like automatic waterers and feeders, fans, and milk equipment.



# RESPOND

**The key to a successful response is to stay tuned in to the weather conditions at hand. Listen for evacuation orders and follow your Farm Disaster Plan.**

## ► MONITOR THE FLOOD CONDITIONS

Monitor watercourses, dams, and public and private levees which could threaten your facility. Orders of mandatory evacuation, emergency dam releases, or reports of levee overtopping, boils, or failure should trigger implementation of your Farm Disaster Plan.

## ► PROTECT CONSUMABLES

Protect animal drugs, fertilizers, pesticides, seeds, and feed, including hay and grain. This can mean repositioning to locations or buildings with higher elevation or creating improvised barriers.

## ► RELOCATE HEAVY EQUIPMENT

Valuable mobile equipment such as tractors, farm trucks, and all-terrain vehicles should be relocated to higher ground.

## ► EVACUATION OF LIVESTOCK

Evacuation may be preferred, but not always possible. If adequate transportation resources (trucks and trailers) are not available, fellow ranchers can sometimes be enlisted to provide aid (see the “Case Study” on page 6).

## ► SHUT OFF UTILITIES

If significant flooding is expected, turn off utilities, turn off electrical breakers, and shut off propane at the tank.





▶ **MINIMIZE WATER DAMAGE**

Leave building doors and windows open at least two inches to equalize pressure and help prevent buildings from shifting. To keep surface water out of your well, use materials such as heavy plastic and duct tape to seal the well cap and top off the well casing.

▶ **SHELTER-IN-PLACE**

For operations with large numbers of animals or for operations with animals ranging over large areas, evacuation may simply not be possible.

- If the usual housing is threatened by flood waters, drive the animals to the highest location available. If relocation to higher ground is not possible (in the case of rising flood waters, for example), it is better to turn livestock loose than to keep them confined.
- Store, or make delivery arrangements for, feed and water at the relocation site. Feed is essential for normal ruminant GI function and heat generation. Providing feed to stranded livestock while flood waters recede is the most important, and sometimes only, action producers can take to save their animals.

▶ **DO NOT ATTEMPT RESCUE**

Technical rescue of submerged large animals is one of the most dangerous procedures performed by first responders. It should never be attempted without an adequately trained and equipped swift water rescue team, assisted by a knowledgeable veterinarian or livestock handler.

**It is never recommended that you ride out an evacuation order; however, if you are trapped or forced to stay behind, do not risk your life or the lives of others trying to save livestock. Involve a DVM and first responders who are trained to help.**

# RECOVER

**It is important to remember that there may be dangerous hazards below standing water. Livestock that were left to shelter-in-place may be tangled in wire or seriously injured. Flood water can be laden with toxins and debris. Upstream sewer and septic systems may be overwhelmed. Call professionals for help.**

▶ **PERFORM AN INITIAL SURVEY**

If animals were sheltered-in-place, ensure that all animals are accounted for and are eating. Take photographs and video footage of damage and losses for insurance claims submission.

▶ **SURVEY FEED DAMAGE**

Check all sources of feeds and pasture forages for spoiling and contamination. Standing water may have ruined some pasture forage, forcing isolated animals to consume contaminated forages or even poisonous plants. Pay particular attention to stored feed and forages, looking for molds, which can both sicken animals and make their products, such as meat and milk, unsafe for human consumption.

▶ **ENSURE WATER QUALITY**

Natural drinking water sources (creeks and lakes) may be unsafe due to chemical or pathogen contamination. Well water may also be contaminated, particularly if the wellhead was inundated and the well seal breached. Have drinking water tested and provide a safe drinking water source until any problems are corrected.

▶ **INSPECT AND CLEANUP BARNYARD**

Check for down power lines and call the electrical company if present. Do not approach. Inspect barnyard for damaged fencing, down boards containing nails, roofing nails, etc. Drag pastures and enclosures to spread out soil and to facilitate drying, and remove debris. Pressure wash stalls with a detergent solution or 1:10 chlorine bleach and allow 15 minutes contact time. Consider safe use of fans and dehumidifiers to aerate barns and

control mold growth. Have barns inspected for structural integrity, if there is any question of roof or wall stability.

▶ **PROTECT AGAINST ANIMAL DISEASE**

Consider vaccinating pastured animals against diseases associated with flood-prone areas such as Blackleg, anthrax, or leptospirosis. Flooding may also increase populations of nematodes and other parasites, such as snails hosting liver flukes. Animals inundated for prolonged periods may also be at greater risk for skin, udder, or GI infections. Consult with your veterinarian about appropriate preventative treatments.

▶ **ENSURE COMPLIANCE WITH ENVIRONMENTAL REGULATIONS**

In some states, failure to report off-site discharge of stored manure during storm events can result in significant fines. Additionally, consider contacting your local cooperative extension office or local USDA-NRCS office about surveying your manure storage for evidence of structural weakening or leakage.

▶ **WATCH FOR DISASTER RELIEF GRANTS**

Following major disasters, state and federal governments may offer disaster relief grants or low-interest loans. For agriculture and animal operations, this assistance is typically managed either through USDA's Natural Resources Conservation Service (NRCS) or its Farm Services Agency (FSA). Important deadline windows for applying may be narrow and documentation of losses and expenditures is essential.



▶ **SALVAGING WET FEED & GRAIN**

Using flood-damaged feed has inherent risks, but in some circumstances it may be logistically and economically possible to salvage some grain. From the top of storage, remove the dry grain by shovel or vacuum. The surest way to salvage wet grain is by a grain dryer. Grain and ear corn can also be spread out on a dry or plastic-covered surface less than six inches deep. Wet grain may also be ensiled to a moisture content of 25 to 35%.

▶ **GUARD AGAINST HAY FIRES**

Flooded hay should be disposed of or used on fields as a fertilizer. It would likely be unsafe for animals to eat, and it would not be worth the time and expense to dry it. Spontaneous combustion can occur in hay with a moisture content of 16 to 20% or higher. Move flooded hay out of and away from structures and animals. Hay can be monitored

daily until it is disposed of either by smell and use of a perforated 10-foot probe through which a thermometer can be lowered to monitor for rising temperatures. Temperatures in excess of 170 degrees F, indicate that a fire is imminent.

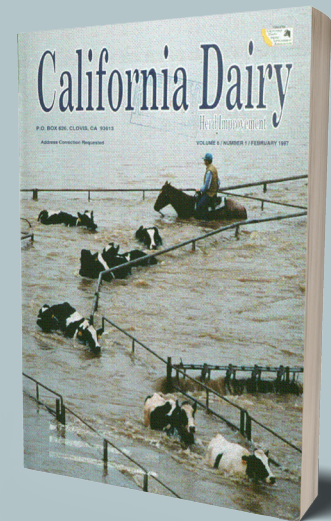
▶ **DISPOSAL OF MORTALITIES**

Rendering is the most environmentally friendly method of carcass disposal, but rendering capacity may be overwhelmed following a flood. Disposal in a landfill is a possibility, but a waiver for the landfill's permit may be required from state authorities to receive this unusual material. Your local USDA-NRCS office may provide suggestions for burial sites which are away from surface water and wells to prevent contamination.

# CASE STUDY

## Dairy Herd Evacuation

During the heavy rainfalls of 1997, a levee dam in the Central Valley of California overtopped and started flooding a dairy. The owner simply started making calls to find relocation sites for his approximately 600 cattle. Assisted by his dairy trade group, the producer located about six neighboring dairies with extra corral space. Emergency phone calls resulted in volunteers arriving with trucks and trailers over a three day period, allowing the herd to be relocated. Following the flooding, the cows were returned to the dairy and commercial operations resumed.



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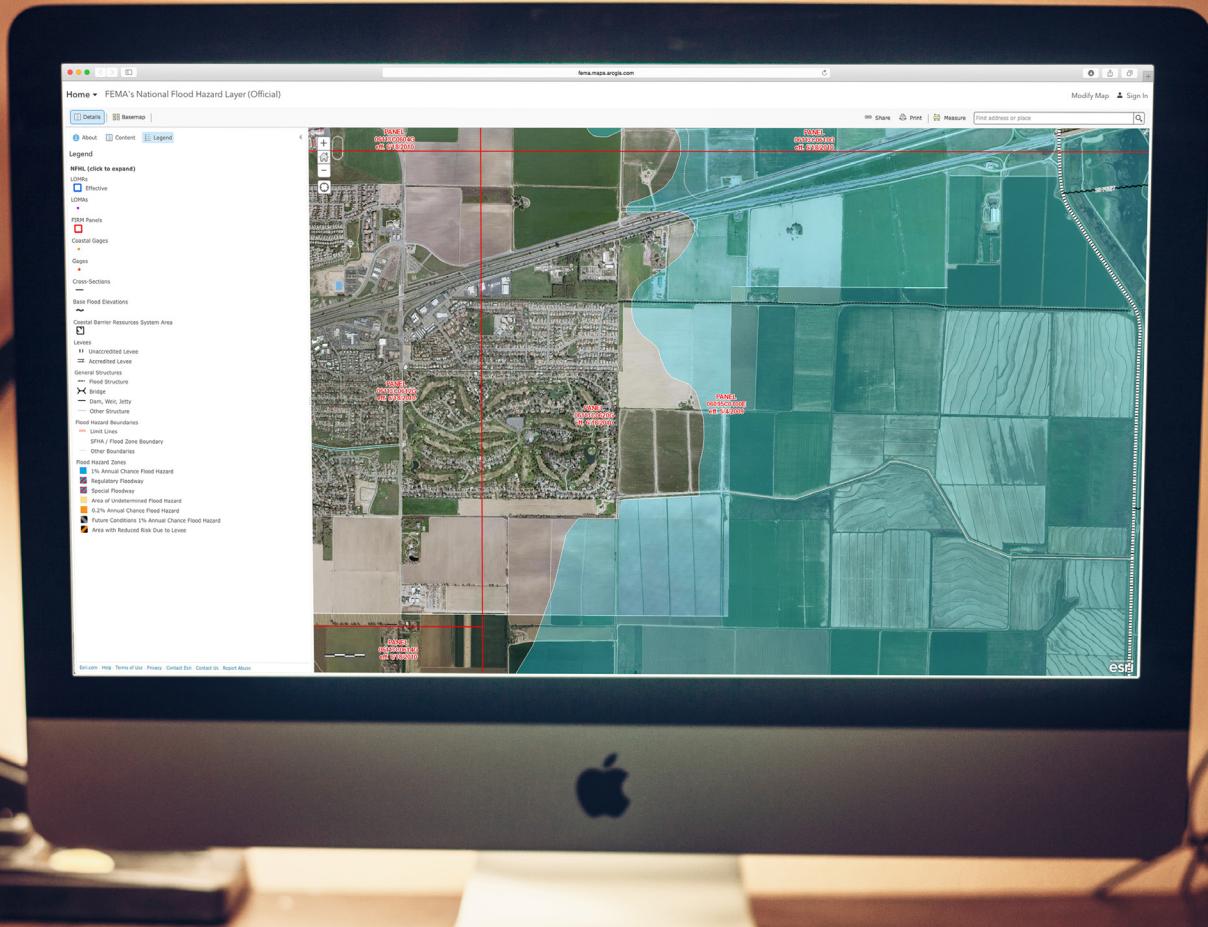
Image by MaryJane Butters via Creative Commons



## HELPFUL LINKS

**Center for Food Safety and Public Health:**  
<http://www.prep4agthreats.org/Natural-Disasters/floods-pets-and-livestock>

**Purdue University Cooperative Extension:**  
<https://ag.purdue.edu/extension/eden/Pages/flood-livestock.aspx>



# FLOOD PLAIN

## How do you know if you are living in a flood plain?

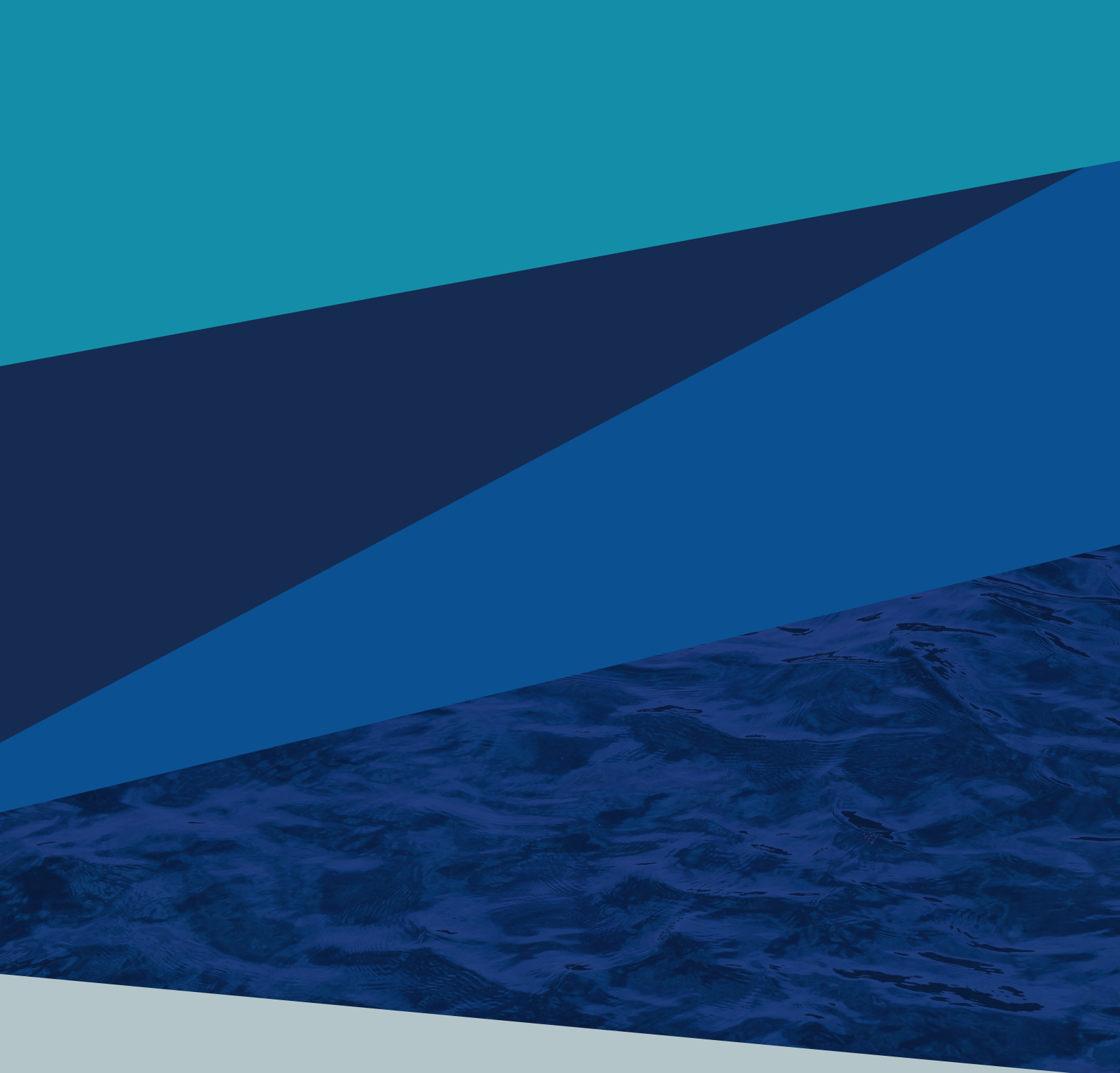
One quick, easy resource to help determine what your flood risk is the FEMA Flood Map Service Center at [www.msc.fema.gov/portal/search](http://www.msc.fema.gov/portal/search).

Simply enter your address and click “search”.

The portal gives you several options for viewing, but the easiest option is the “Interactive Map” display.

The example above shows a typical result, with the blue shading indicating an area having a 1% (1-in-100-chance) of flooding every year. This area is sometimes referred to (inaccurately) as a “100-year” flood plain and is equivalent to a 26% chance of experiencing flooding during a 30-year mortgage period.

The FEMA flood map does not tell you how severe the flooding might be; for example, whether the water will be one foot or six feet deep, or what the speed of the current of the floodwaters will be.



## FOR MORE INFORMATION, CONTACT US

### Center for Equine Health

530.752.6433

[www.vetmed.ucdavis.edu/ceh](http://www.vetmed.ucdavis.edu/ceh)

[www.facebook.com/ucdavis.ceh](https://www.facebook.com/ucdavis.ceh)



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