

Mitigation Measures	Project Cost	Responsibility	Project Priority	Timeline	Notes
All Hazards Mitigations for Goal A: <i>Develop and Activate Emergency Notification Systems for the Community</i>					
Determine who announces a state of emergency and how, when. Establish Tribal Emergency Response Committee.	Low cost	Tribal Council; Tribal Operations; Planning; Fire Chief; Department Heads	High	2018	Tribe's Emergency Management Project to be completed by 9/30/18.
Develop a process to ensure all regional/tribal/federal emergency response channels are tuned to same frequency	Low Cost	Fire Chief	High		
Develop an early warning system for timely notification of all residents via multiple access points (phone, text, email, social media, etc.). Discuss whether the Superior Connections tower can be adapted to broadcast these kinds of messages.		Communications Team	High		Need system/training for improved internal communications.
Increase hazard warning and forecasting opportunities with related partners: Create warnings specific to each type of natural disasters.	Low cost	Natural Resources Dept.	High		Partners dependent upon disaster type.
Develop a process for making a database of vulnerable people to make welfare checks	Low cost	Health and Wellness Center; Social Services	High		Who maintains database? Frequency and process for updates?
Install sirens at each housing area and main building clusters.			High		
Organize a "runner" network using bull horns in each neighborhood and go house to house with warnings about impending disasters.	Low cost		Medium		

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All Hazards Mitigations for Goal B: <i>Develop Methods and Initiatives to Protect Cultural Properties</i>					
Identify priority list of cultural properties to protect, including historic properties in Old Odanah.	Low Cost	NRD: THPO	Medium		
Identify protection methods including description, where they are, who is responsible for doing what.	Low Cost	NRD: THPO	Medium		
Begin implementation practices to protect these cultural properties.		Natural Resources Dept.	Medium		
All Hazards Mitigations for Goal C: <i>Develop Back-up Power Sources to Protect People and Resources</i>					
Identify what properties must have back-up power; what sources are best for each location.	Low Cost	Facilities/Maintenance; Planning	High		Community Center needs back-up power.
Begin purchasing back-up power sources.		Facilities/Maintenance; Planning	High		Incorporate solar power.
Develop a schedule for testing back-up power sources		Facilities/Maintenance; Casino	High		
Repair and upgrade renewable energy systems (solar and wind) at the Tribal Hatchery .	\$25,000 for battery replacements	NRD: Fisheries	Medium		Need expert to evaluate systems to determine solutions.
All Hazards Mitigations for Goal D: <i>Develop Emergency Shelters and Safe Places</i>					
Identify needs for emergency safe rooms or shelters in all types of natural disasters and develop a plan for how, when and where to build safe rooms or shelters.	Low Cost	Planning; Natural Resources Dept.	High		Consider Birch Hill area.
Establish cooling/warming centers at pre-designated community locations for use during power outages			High		

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Develop transportation plan to move people to identified shelters in emergencies.			Medium		
Investigate need for placement of sump pumps, shop vacs, and Personal Protection Equipment (PPE) (employ tribal members and contact with partners) (<i>used by whom?</i>).			Medium		
Have cots, blankets, personal care products, etc., at community locations. Have first aid supplies storage in case of large-scale injuries. Provide face masks for smoke and ash. Have clean-up kits/materials.			Medium		
Install safe rooms in critical infrastructure or shelters as necessary.			Medium		Create safe room in Elderly Center.
Construct large garages for vehicles and equipment storage.			Low		
Construct safety pavilions around the community for retreat from hail and other bad weather conditions.			Low		
Purchase storage bins for disaster victims' personal property.			Low		
All Hazards Mitigations for Goal E: <i>Create Alternative Access Routes</i>					
Identify options for evacuations in different types of natural disasters using maps and other tools.	Low Cost	Roads Department; Planning; NRD: GIS	High		
Publish evacuation routes for the community to use in case of road closures.	Low Cost	Roads Department; Planning; NRD: GIS	High		

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All Hazards Mitigations for Goal F: <i>Develop Codes and Ordinances</i>					
Develop standard building codes to ensure new buildings meet strict design and construction requirements; write codes to address retrofit construction.		Legal Department; Housing Authority; Council	Medium		
All Hazards Mitigations for Goal G: <i>Develop Management Plans and Initiatives that Protect Natural and Human Resources</i>					
Develop a training program by assessing training needs and status; work with the National Disaster Training Center to define needs and training options. Require that key tribal emergency personal take incident command center training	Low Cost (unless contracted)	<i>Emergency Manager;</i> Bad River Fire Dept. and First Responders; Planning; NRD: Brownfields	High		
Develop a plan to create a tribal emergency manager position or department to manage all hazards; manager participates in meetings, trainings, and activities of the Wisconsin Tribal Emergency Management Association (WisTEMA) and the National Tribal Emergency Association.		Planning Department; Tribal Operations; Tribal Council; Natural Resources Dept.	High		
Develop a plan to procure and store emergency supplies.	Low Cost (unless contracted)	Bad River Health and Wellness Center	Medium		
Develop a debris management plan.	Low Cost (unless contracted)	Solid Waste/Recycling; Natural Resources Dept.	Medium		
Develop a well head/source water protection plan to protect community wells.	Low Cost (unless contracted)	Water/Sewer Dept.; Natural Resources Dept.	Medium		
Develop a community-coordinated system of organization to assess residents' needs.		Social Services	Medium		

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Ensure proper documentation required by FEMA is available and ready to be prepared when needed; store the documentation with identified personnel.	Low Cost (unless contracted)	Planning Department; <i>Emergency Manager</i> ; Benefits/Insurance	Medium		
Increase food sovereignty efforts.		Food Sovereignty	Medium		
Develop a landscaping and vegetation management plan to minimize damages from wildfires and blowdowns.	Low Cost (unless contracted)	Natural Resources Dept.	Low		
Purchase or acquire land within the Reservation, especially in Conservation Areas and Watershed Protection Areas (WPAs).		Natural Resources Dept.	Low		
All Hazards Mitigations for Goal H: <i>Develop Methods and Initiatives that Protect Critical Infrastructure</i>					
Develop a priority list of all infrastructure to rank which are high, moderate, and low priority for protecting from disasters' impacts.	Low Cost	Planning; <i>Emergency Manager</i> ; Facilities/Maintenance; Other Departments	High		The WWTP and air monitoring site as high priorities.
Improve the adequacy of infrastructure based on evaluation.			Medium		
Build shed for generator at Elderly Center.			Medium		
All Hazards Mitigations for Goal I: <i>Develop Partnerships with Regional, State, and Federal Agencies</i>					
Develop comprehensive list of partners to work with to share resources, get help with training, and other functions.	Low Cost	All Departments (depedent upon function)	High		
Develop partnership with Ashland and Iron counties' emergency preparedness departments.	Low Cost	<i>Emergency Manager</i>	High		
Develop a partnership with the Bad River Wellness Center's pharmacy to find ways to ensure community members get medications or medical treatments as needed during a disaster.	Low Cost	Health & Wellness Center	High		

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Develop partnership with the National Guard to help with special evacuations and other functions.	Low Cost		Medium		
Work with the National Disaster Training Center to define needs and training options.	Low Cost		Medium		
Recruit and organize tribal chain saw crews to help remove downed trees and vegetation.	Low Cost		Medium		
Develop partnership with Red Cross to install safe rooms in vulnerable homes	Low Cost		Low		
Develop partnership with Red Cross to install smoke detectors in homes.	Low Cost		Low		
Develop partnership with Mutual Aid Disaster Relief group	Low Cost		Low		Mutualaid disasterrelief.org
All Hazards Mitigations for Goal J: <i>Develop Community Outreach and Education Campaigns for Diverse Audiences</i>					
Develop a process for increasing “household readiness” practices such as making a household evacuation plan, putting together a go bag, getting trained in first aid, etc.		<i>Emergency Manager</i>	High		
Train volunteers to be weather spotters for NOAA to track weather events and keep records as part of a citizen science campaign.		Natural Resources Dept.; NOAA	Medium		
Develop campaign focusing on safe storage of important household items and documents; define how to safely store ammunition so it doesn’t explode in fires; work with departments and an archival expert to identify safe storage needs and options.			Medium		

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Schedule and conduct community trainings for a “Household Mitigation Plan” that reminds residents what to do in disasters (shut off power, water and gas; empty freezers; where to evacuate, etc.; emphasize safety first.			Medium		
Distribute information about how to handle downed power lines		Power companies	Low		
Flooding (High Priority Disaster)					
Constructing berms around the Tribe's Wastewater Treatment (SBR) facility.		Water/Sewer Dept.	High		
Continue partnership with USGS to maintain long-term gaging station on the Bad River at Elm Hoist Road.	\$6,350/year (plus USGS matching funds)	NRD: Water Resources; USGS	High	Ongoing	
Continue partnership with USGS to maintain stage recorded installed at Bad River at Highway 2.	\$4,800/year (\$3,600/year if USGS matching funds)	NRD: Water Resources; USGS	High	Ongoing	Installed in 2017. Funds needed for FY2019 and beyond.
Continue partnership with USGS and NWS to assist with advanced communication to inform the Tribe when an eminent threat of flooding is present.		Natural Resources Dept.; USGS; NWS	High	Ongoing	
Develop new and enforce existing tribal ordinances that define development setbacks from Lake Superior and major rivers.		Legal Department; Natural Resources; Tribal Council	High		Applicable also to coastal and riverbank erosion hazard.
Conduct wetland functional assessment and prioritize restoration and protection efforts.	BIA GLRI funded project	Natural Resources Dept.	High	2018	Lower Bad Watershed is project focus.

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Flooding (High Priority Disaster) - <i>continued</i>					
Implement priority projects to enhance flood storage as identified by the wetland functional assessment of the Lower Bad Watershed.		Natural Resources Dept; Partners vary by project.	High		Denomie Creek watershed is priority.
Create maps of all floodplains in partnership with FEMA.		NRD: GIS; FEMA	High		
Improve hydrology and wetland functions along Highway 2.		Natural Resources Dept.; Roads Department; Wisconsin DOT	High		
Update and expand the Tribe's culvert inventory for the Reservation and use updated inventory to prioritize culvert replacements.		Natural Resources Dept.; Roads Department	High		Application for NOAA funding submitted 3/2018.
Require use of community water and wastewater systems for all buildings in a floodplain.		Water/Sewer Dept.; NRD: POWTS; Indian Health Service	Medium		Limit new development in a floodplain.
Install or replace culverts and other structures (French drains, etc.) crossing water resources to handle larger flows and/or improve hydrologic connections and flood storage.		Natural Resources Dept.; Roads Department; Town Roads Dept.	Medium		
Identify and relocate structures and other assets that are repetitive losses		Planning; Natural Resources Dept.	Medium		
Evaluate the soils at the Tribe's Hatchery Ponds to assess re-design of the ponds.	\$12,000	NRD: Fisheries; WTCAC	Medium		
Re-design the Tribe's Hatchery Ponds based on the soil tests.		Natural Resources Dept.	Medium		
Reduce permeable surfaces at the Bad River Casino/Moccasin Trail Center to improve stormwater management.		Planning; Natural Resources Dept.	Medium		

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Flooding (High Priority Disaster) - <i>continued</i>					
Prioritize projects to improve infrastructure such as burying electric power lines.		Natural Resources Dept.; Planning; Tribal Council; Power companies	Medium		
Provide potable drinking water at the Pow Wow grounds by tapping into the community water system and converting existing well to a non-portable source (or abandon if not needed)		Water and Sewer; Planning; Natural Resources Dept.	Medium		
Build another bridge over Bad River to provide an alternative route to cross flooded areas.			Medium		
Conduct outreach campaign to inform existing homeowners about best management practices that reduce stormwater runoff, such as planting native plants; minimizing roof runoff with rain barrels and rain gardens; minimize impermeable surfaces as much as possible, etc.		NRD: Water Resources	Medium		
Develop partnership with Xcel Energy to plan for water releases from the White River dam	Low Cost	Natural Resources Dept.; Tribal Council	Medium		
Educate community members about the availability and importance of flood insurance.	Low Cost	Housing Authority; Planning	Medium		
Upgrade the Bad River at Highway 2 station to an index velocity and discharge station (in collaboration with USGS).	\$39,500 for first year; \$14,500 for subsequent years	NRD: Water Resources; USGS	Low		USGS matching funds may be available.
Maximize permeable surfaces at future development projects.		Planning; Natural Resources Dept.	Low		

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Winter Snow and Ice Storms (High Priority Disaster)					
Conduct outreach campaigns on how to stay safe during extremely cold weather, such as dangers of wind chill, staying safe in a car while driving or stuck on the road; dangers of using propane heaters indoors; importance of using carbon monoxide detectors, etc.		<i>Emergency Manager</i>	Medium		
Develop a priority plan for road clearance for all terrain transportation		Roads Department	Low		
Contaminated Waterways (High Priority Disaster)					
Evaluate the risk and vulnerabilities of hazardous materials transportation within the Reservation and develop emergency response procedures.	PHMSA-funded project	Planning; Natural Resources Dept.; Other Tribal Dept.	High	In progress	Scheduled to be completed 9/30/18.
Decommission and remove Enbridge Line 5 pipeline from the Bad River Watershed.			High		Council resolution from 1/4/17.
Implement actions aligned with the Marengo River Watershed Action Plan.		Natural Resources Dept.; Superior Rivers Watershed Association; Others	High		
Implement actions aligned with the Tribe's Non-Point Source Management Plan.		Natural Resources Dept.	Medium		
Improve implementation and enforcement of septic system (POWTS) ordinance		NRD: POWTS	Low		
Improve implementation and enforcement of lease ordinance and other ordinances to reduce garbage and waste on residential properties.		Natural Resources Dept.	Low		

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Wildfires					
Recruit, hire, and train Bad River Band members to participate on a wildlands firefighting crew			High		
Schedule regular training sessions for fire fighters and emergency responders; help all fire fighters get red cards through BIA training.			High		
Conduct outreach campaigns that encourage homeowners to plant and maintain landscaping vegetation at safe distances from homes using the FireWise program recommendations.	Low Cost	Natural Resources Dept.; Housing Authority; Facility/Maintenance	High		
Increase community awareness of the WDNR brush chipping program to control flammable brush piles.	Low Cost	NRD: Air	High		
Improve access to purchasing metal roofing materials as an alternative to flammable materials through outreach and financing plans.		Housing Authority	High		
Develop and conduct outreach campaigns that promote fire prevention and mitigation strategies (such as Smokey the Bear, safe camp fires, safe fireworks, etc.).	Low Cost	NRD: Air	High		
Develop educational programs and materials about dangers of burn barrels as a cause of wildfires; educate about NRD burn ordinance and fines.		NRD: Air	Medium		
Conduct prescribed fires where needed to reduce fuel loads		Natural Resources Dept.; BIA	Medium		
Inventory and evaluate whether the Tribe has enough fire hydrants in key locations, especially in community neighborhoods.	Low Cost		Medium		

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Conduct inventory of households' driveways to ensure they allow access for rescue vehicles.	Low Cost	Bad River Fire Dept.	Medium		
Develop conditions in right of way lease renewals that incorporate conditions in ROWs to brush and to complete other activities to prevent fire or spread of fire.		Tribal Council; Legal; Natural Resources Dept.	Medium		
Update the NRD Integrated Resource Management Plan (IRMP) to include plans for prescribed burns.		Natural Resources Dept.; BIA	Medium		
Inventory the number and location of water pumps in unpopulated areas to ensure adequate water supplies in case of fires that result from dry conditions.	Low Cost		Medium		
Construct a fire tower on the Reservation.		Water/Sewer Dept.; Indian Health Service	Medium		New water tower in New Odanah currently in progress.
Maintain and improve fire breaks			Medium		
Develop an information campaign about how to seal homes to prevent wildfires' smoke and ash; how to make air filters for a building to keep smoke and ash out.		NRD: Air	Low		
Increase air monitoring efforts during fire season by installing permanent smog camera on Birch Hill		NRD: Air	Low		

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Wildfires - <i>continued</i>					
Improve capabilities to fight wildfires by putting pipe and pumps in streams and ponds that connect to fire hoses on fire trucks.			Low		
Improve capabilities to fight wildfires by installing underground water storage tanks			Low		
Codify fire buffer zones around structures			Low		
Coastal and Riverbank Erosion					
Develop a grading system for new construction.			Medium		
Identify high risk areas that have greatest erosion potential and prioritize installation of protection strategies at those sites.		Natural Resources Dept.	Medium		
Restore and protect wetlands along undeveloped shorelines, using the wetland functional assessment results to prioritize projects in the Lower Bad Watershed.		Natural Resources Dept.; Others dependent upon project.	Medium		
Stabilize the shoreline and implement BMPs at the Tribe's Anderson house to protect the structures and minimize erosion.		Facility/Maintenance; Natural Resources Dept.; Planning	Medium		
Drought					
Research static water level, especially Birch Hill. Collection of groundwater baseline.		Natural Resources Dept.	Medium		
Update Tribe's well inventory to identify wells that could be used in case of water shortages. Assess they are working properly and test for quality.		Water/Sewer Dept.; Indian Health Service; Natural Resources Dept.	Medium		

