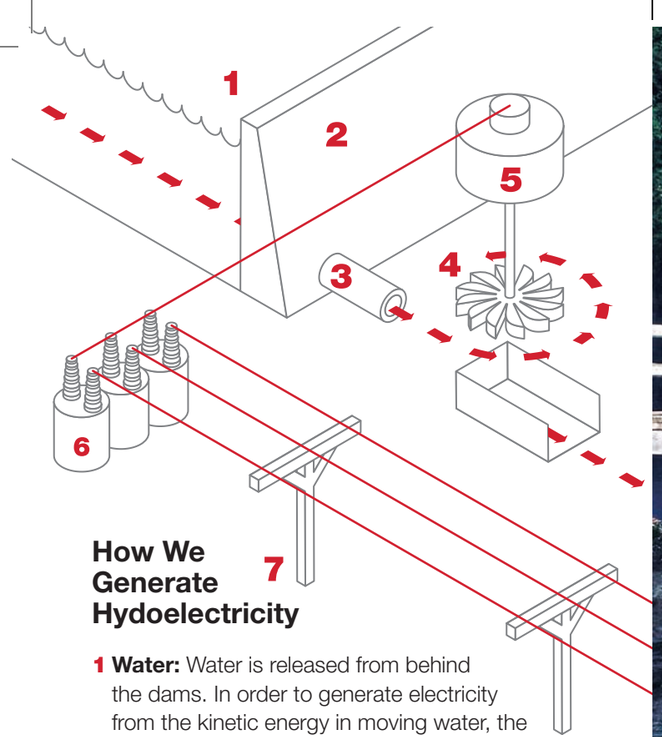

How We Generate Hydoelectricity

1 **Water:** Water is released from behind the dams. In order to generate electricity from the kinetic energy in moving water, the water has to be moving with sufficient speed and volume to turn a generator.

2 **Dam:** The force of falling water is necessary to create electricity. To increase the force of moving water, dams are used to raise the water level, creating a “hydraulic head,” or height differential.

3 **Penstock:** A penstock pipe is used to carry the water to the turbine.

4 **Turbine:** Fast-moving water pushes the blades, which turn the moving parts of the electric generator. The water then returns unchanged to the river.

5 **Generator:** Magnets on the rotor sweep past stationary copper coils producing electricity.

6 **Transformer:** Electricity goes through transformers, which raise the voltage so electricity can travel long distances via power lines.

7 **Transmission:** Underground cables or overhead lines are used to transmit the electricity.

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A Safety Guide to **Montana’s Dams**

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MONTANA’S HISTORIC DAMS

At NorthWestern Energy, we’re proud to provide such a clean, sustainable energy source for the state of Montana. We’re committed to the stewardship of Montana’s river resources as well as maintaining vibrant and significant recreational opportunities for everyone in these communities. Before you use the waters above and below dams for boating, waterskiing, swimming and fishing, please read this brochure, consult Montana Fish, Wildlife & Parks’ boating and fishing regulations, and always practice safety first.

Kerr 194 MW
Flathead River
5 miles southwest of Polson

Picnicking, camping, whitewater rafting, boating, fishing and scenic overlook

Black Eagle 21 MW
Missouri River
2 miles east of Great Falls

Scenic viewing, hiking, biking and picnicking

Rainbow 60 MW
Missouri River
6 miles northeast of Great Falls

Picnicking, hiking, biking, fish hatchery, displays and scenic overlooks

Cochrane 64 MW
Missouri River
8 miles northeast of Great Falls

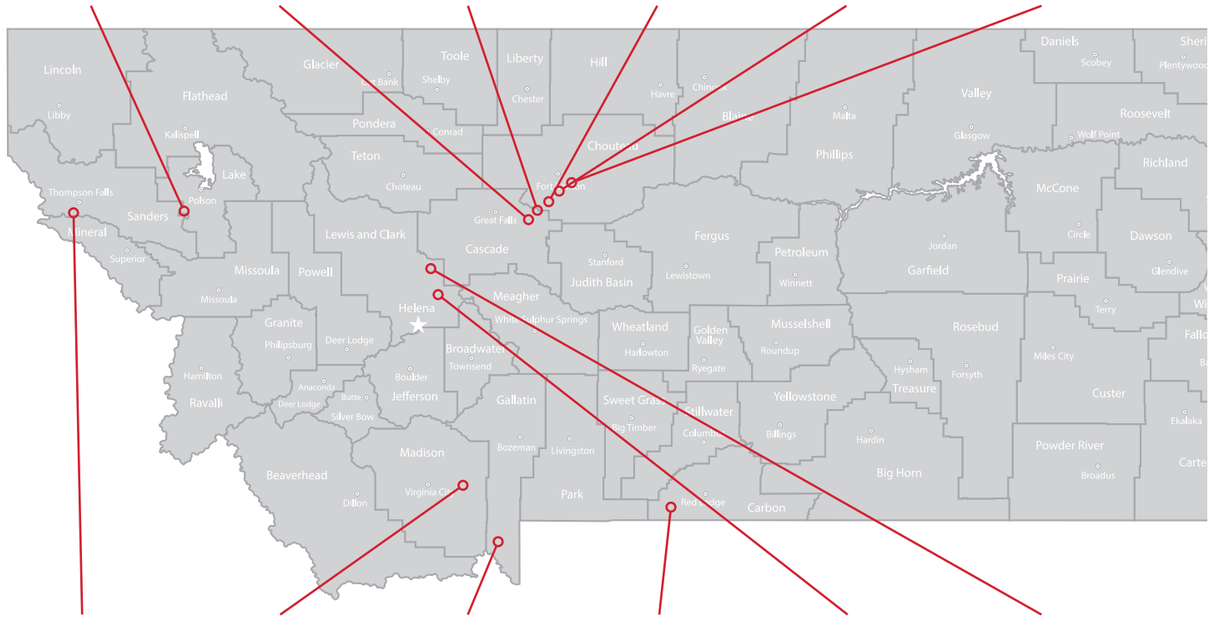
No recreation facilities

Ryan 60 MW
Missouri River
15 miles northeast of Great Falls

Island park picnic area with handicap access and scenic overlooks

Morony 48 MW
Missouri River
20 miles northeast of Great Falls

Fishing, hiking and whitewater rafting



Thompson Falls 94 MW
Clark Fork River
100 miles northwest of Missoula

Picnicking, hiking, fishing, displays and scenic overlooks

Madison 9 MW
Madison River
10 miles north of Ennis

Picnicking, camping, hiking, fishing, boating and white-water rafting

Hebgen Lake Reservoir
Madison River
30 miles northwest of W. Yellowstone

Picnicking, camping, fishing and boating

Mystic Lake Reservoir
West Rosebud Creek
75 miles southwest of Billings

Picnicking, backpacking, camping, fishing and scenic viewing

Hauser 19 MW
Missouri River
14 miles northeast of Helena

Picnicking, camping, hiking, fishing and boating

Holter 48 MW
Missouri River
43 miles northeast of Helena

Picnicking, camping, hiking, fishing and boating

UNDERSTANDING DAM SAFETY

Dams provide many benefits, such as producing electricity; supplying water for agriculture, industry and households; controlling flooding; and providing significant recreational and economic opportunities. However, there are risks associated with any water-based recreation. For this reason, we want to communicate the potential hazards and safety measures that should be practiced when in the vicinity of hydroelectric dams.

Dams have two main functions:
1) Storing water to compensate for fluctuations in river flow or in the demand for water and energy.

2) Raising the water level upstream to enable water to be diverted into a canal or to increase 'hydraulic head.' The creation of storage and head is what allows dams to generate electricity.

The electrical generators at the powerhouses are connected to the western United States' power grid and respond automatically to high demand. When the generators start up, a torrent of water is released downstream, causing water levels to change.

Conditions That Signal Rising Water:

- Warning strobe lights or sirens
- Increased water velocity
- Sounds of rushing water intensify
- Exposed rocks, sticks and brush become covered with water
- Water turns cloudy
- Increased bird or other wildlife activity

Signs Save Lives

Every year, people and even pets are seriously injured or killed at dams. Most of these accidents could be avoided by simply obeying all the warning signs.

BE ALERT FOR WATER LEVEL CHANGES

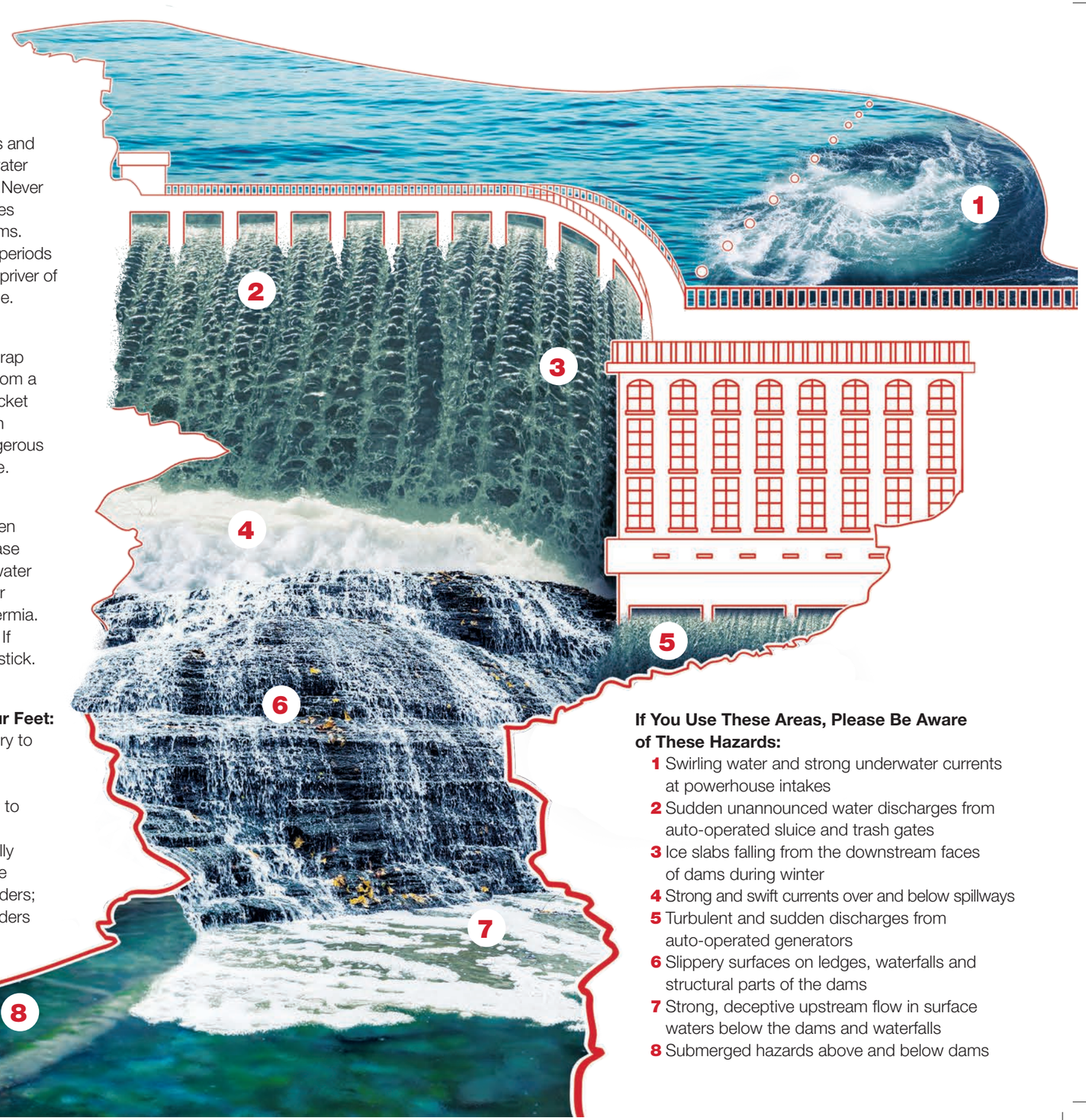
Boating
Water levels can fluctuate rapidly at all dams and a sudden discharge will release a wave of water that can sink an anchored boat in seconds. Never take your boat over or under restrictive cables with warning signs or boat restraining systems. Depending on maintenance schedules and periods of high river flow, boat restraining systems upriver of a dam may not be in place. Never boat alone.

Fishing
The water below a dam can "boil up" and trap or capsize a boat in an instant. If you fish from a boat below a dam, always wear your life jacket and leave your engine running in case of an emergency. Anchoring below dams is dangerous and should never be done. Never fish alone.

Wading
Many rivers downstream can be waded even when electricity is generating, but an increase in generating load can cause a rise in the water that may become dangerous. A fall in water temperature could cause shock or hypothermia. While wading, always wear your life jacket. If walking in the river channel, use a walking stick. Never wade or swim alone.

If Caught in the Water or Swept off Your Feet:

- Stay calm, lie on your back and don't try to stand up
- Drop any items that weigh you down
- Keep feet up and pointed downstream to avoid hitting rocks and entrapments
- Go with the current and move diagonally across the current until you reach shore
- Roll onto dry land to drain boots or waders; don't stand until the water is out of waders
- If trapped on an island, signal for help; don't risk crossing the river



If You Use These Areas, Please Be Aware of These Hazards:

1. Swirling water and strong underwater currents at powerhouse intakes
2. Sudden unannounced water discharges from auto-operated sluice and trash gates
3. Ice slabs falling from the downstream faces of dams during winter
4. Strong and swift currents over and below spillways
5. Turbulent and sudden discharges from auto-operated generators
6. Slippery surfaces on ledges, waterfalls and structural parts of the dams
7. Strong, deceptive upstream flow in surface waters below the dams and waterfalls
8. Submerged hazards above and below dams