Roseau River Watershed Hydrology & Stream Stability

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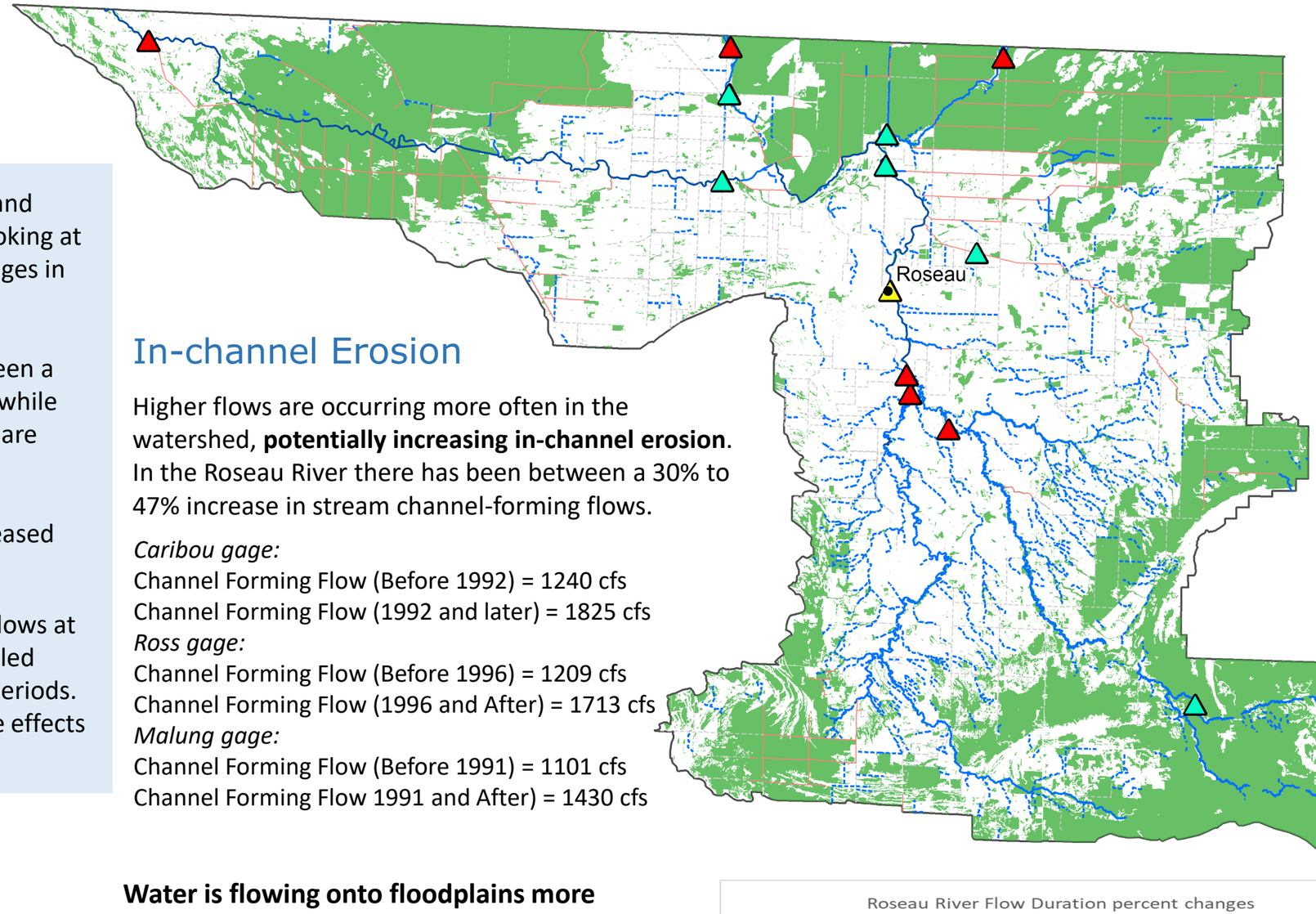
Changes in precipitation and flow are evident when looking at three “long term” flow gages in the watershed:

- Dry conditions have seen a reduction (avg. 67%), while the wetter conditions are increasing (avg. 97%).
- Precipitation has increased on average (21%).
- August Median base flows at all gages at least doubled from past to current periods. This can have negative effects on fish communities.



In-channel Erosion

Higher flows are occurring more often in the watershed, **potentially increasing in-channel erosion**. In the Roseau River there has been between a 30% to 47% increase in stream channel-forming flows.

Caribou gage:
Channel Forming Flow (Before 1992) = 1240 cfs
Channel Forming Flow (1992 and later) = 1825 cfs
Ross gage:
Channel Forming Flow (Before 1996) = 1209 cfs
Channel Forming Flow (1996 and After) = 1713 cfs
Malung gage:
Channel Forming Flow (Before 1991) = 1101 cfs
Channel Forming Flow 1991 and After) = 1430 cfs

Hay Creek and Severson Creek are exhibiting symptoms of unstable systems.

With limited access to disperse flow during higher flood events, these systems will need to widen and possibly deepen more. This will result in channel erosion.

Floodplains

Floodplains:

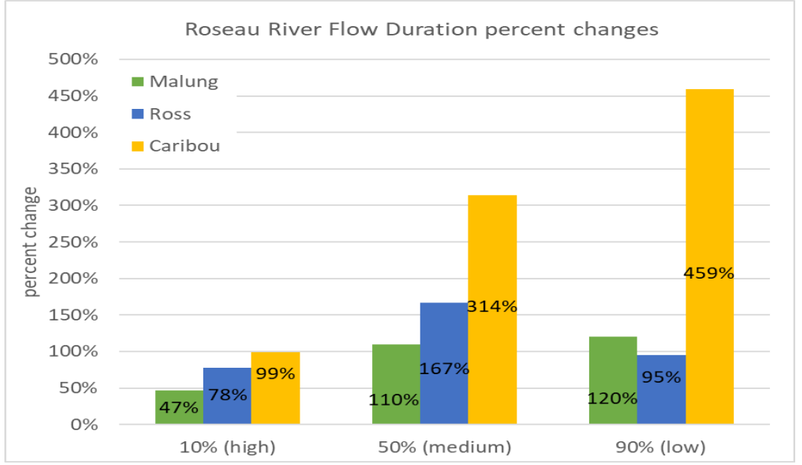
- Reduce the depth and power of a river during high flows
- Provide habitat for aquatic and upland species
- Trap sediment
- Promote nutrient cycling
- Improve bank stability

Water is flowing onto floodplains more frequently.

Caribou gage: After 1992, 1240 cfs is exceeded 18% of the time but only 6.3% prior to 1992

Ross gage: After 1996, 1209 cfs is exceeded 13% of the time, but only 6% prior to 1996

Malung gage: After 1991, 1101 cfs is exceeded 3.3% of the time but only 3% prior to 1991. This small increase is likely due to the landscape and storage in the upper portion of the watershed.



Flow Durations:
Amount of water flowing during low, medium and high flow events has increased. This can impact fish and other communities.

Watershed Highlights: Roseau River

Recreation

StatePark

Trout Stream

There is an abundance of recreational opportunities in this watershed. Areas like **Hayes Lake State Park** and the brook trout stocked Bemis Hill Creek provide bountiful opportunities for the public.

Wildlife Management Areas

Wildlife Management Areas

WMAs provide outdoor recreation and are established to protect those lands and waters that have the potential for wildlife production, public hunting, fishing, and other compatible recreational uses.

Concerns

- Access to floodplains
- Water quality impairments from increased flows impacting streambanks
- Erosion, flooding and fish movement issues caused by improperly sized or poorly positioned culverts
- Changes in flow regime and impacts to fish communities
- Poor aquatic habitat

The Roseau River watershed has a diverse fishery including channel catfish, walleye, northern pike and lake sturgeon. At Bemis Hill, brook and brown trout can be found.

Lake Sturgeon, once locally extinct, are being reestablished into lakes and streams. Removing or modifying dams and providing quality habitat helps these and other fish populations thrive.

Parkland Prairie / SNAs

Tallgrass Aspen Parkland

Scientific and Natural Areas

Sprague Creek SNA harbors one of only five spring fens known in Minnesota. Upwellings of mineral-rich groundwater feed into a network of open (unforested) channels that branch, then rejoin, as they drain through an extensive swamp forest of black spruce, tamarack and white cedar.

State Forests

State Forest

The Lost River SF in the north and the Beltrami Island SF to the southeast provide ample outdoor recreational opportunities. These lands are available for off-highway vehicle riding, camping, wildlife watching, harvesting berries, wild rice, mushrooms, and evergreens.

CLEAN WATER LAND & LEGACY AMENDMENT

GIS data layers - https://www.dnr.state.mn.us/whaf/about/resources.html

DEPARTMENT OF NATURAL RESOURCES