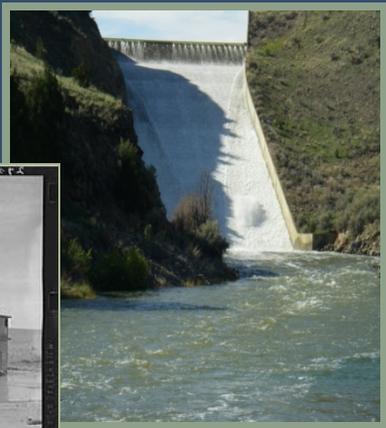




Upper Missouri Basin Water Use An Overview

Ann Schwend
MT DNRC Water Planner

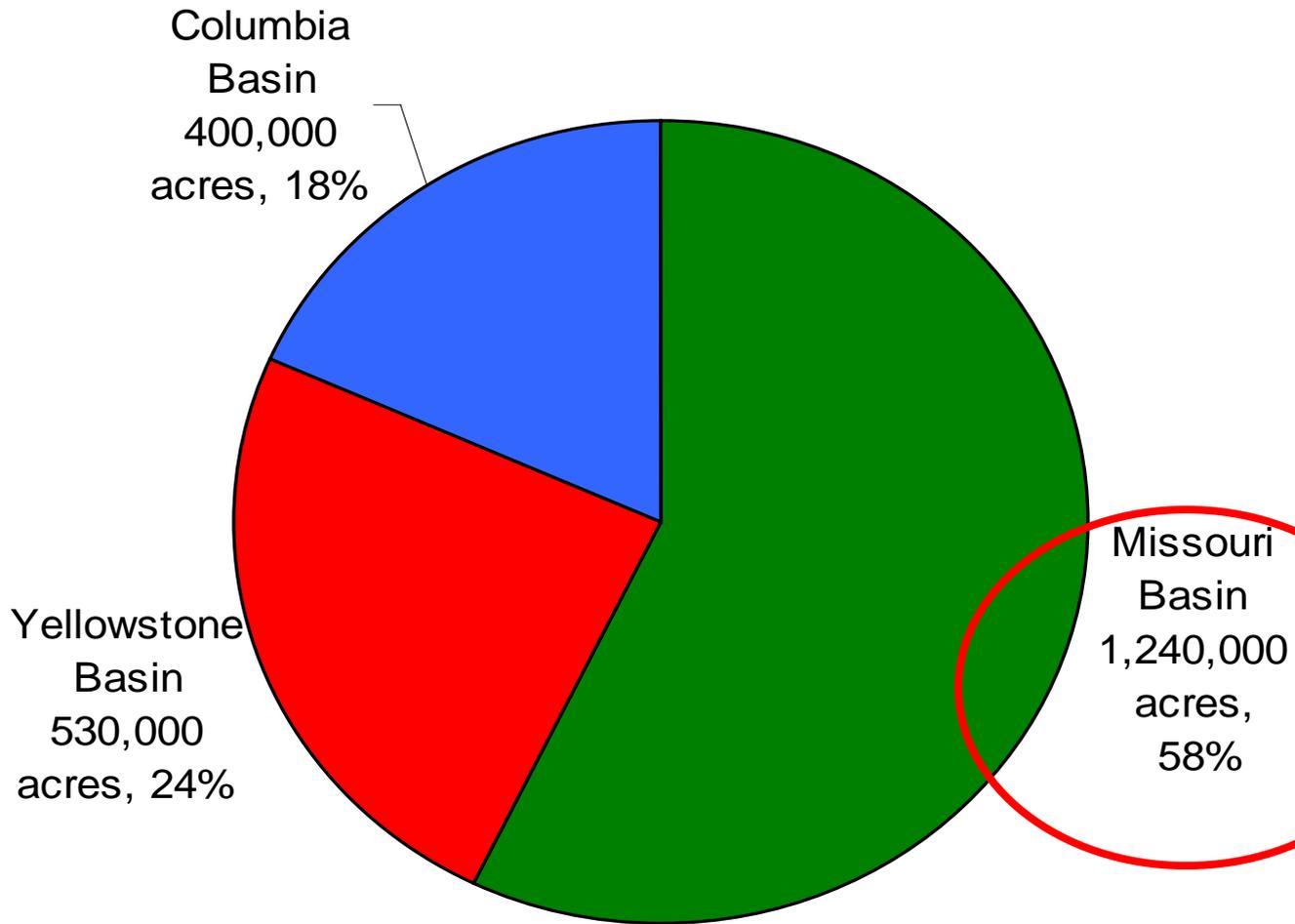






Agricultural Water Use

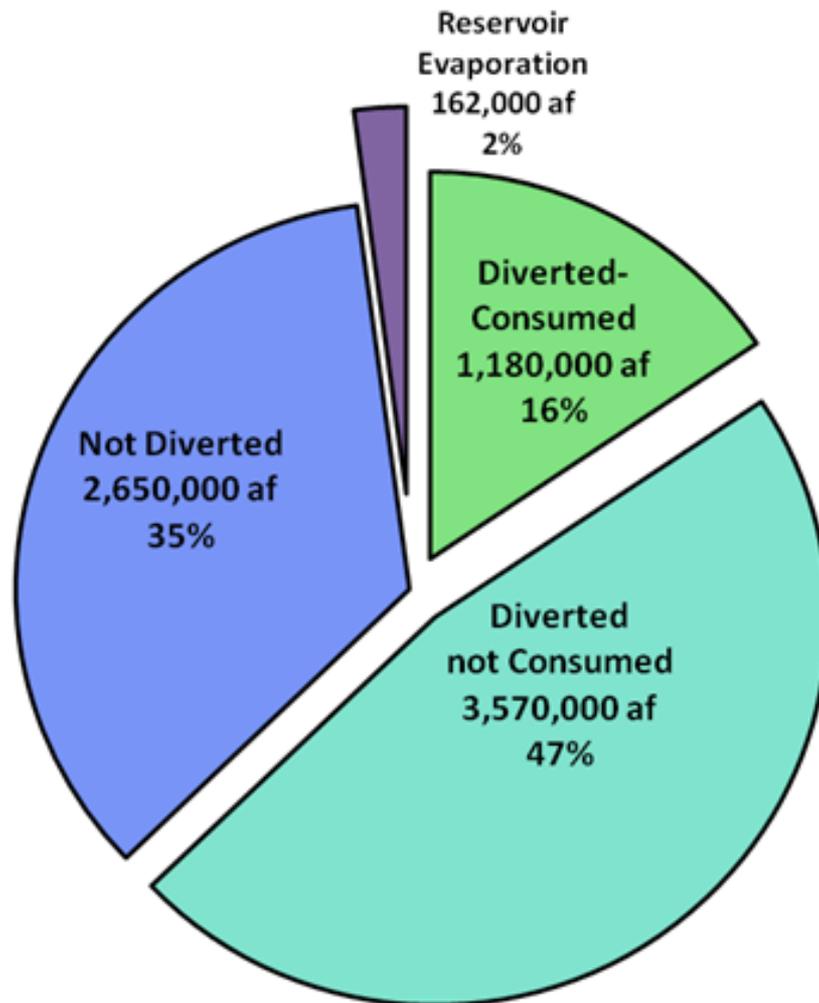
Acres Irrigated in Montana by River Basin (2,170,000 acres total)







Generalized Upper Missouri Basin Average Annual Water Budget (7,560,000 Acre-Feet Total)



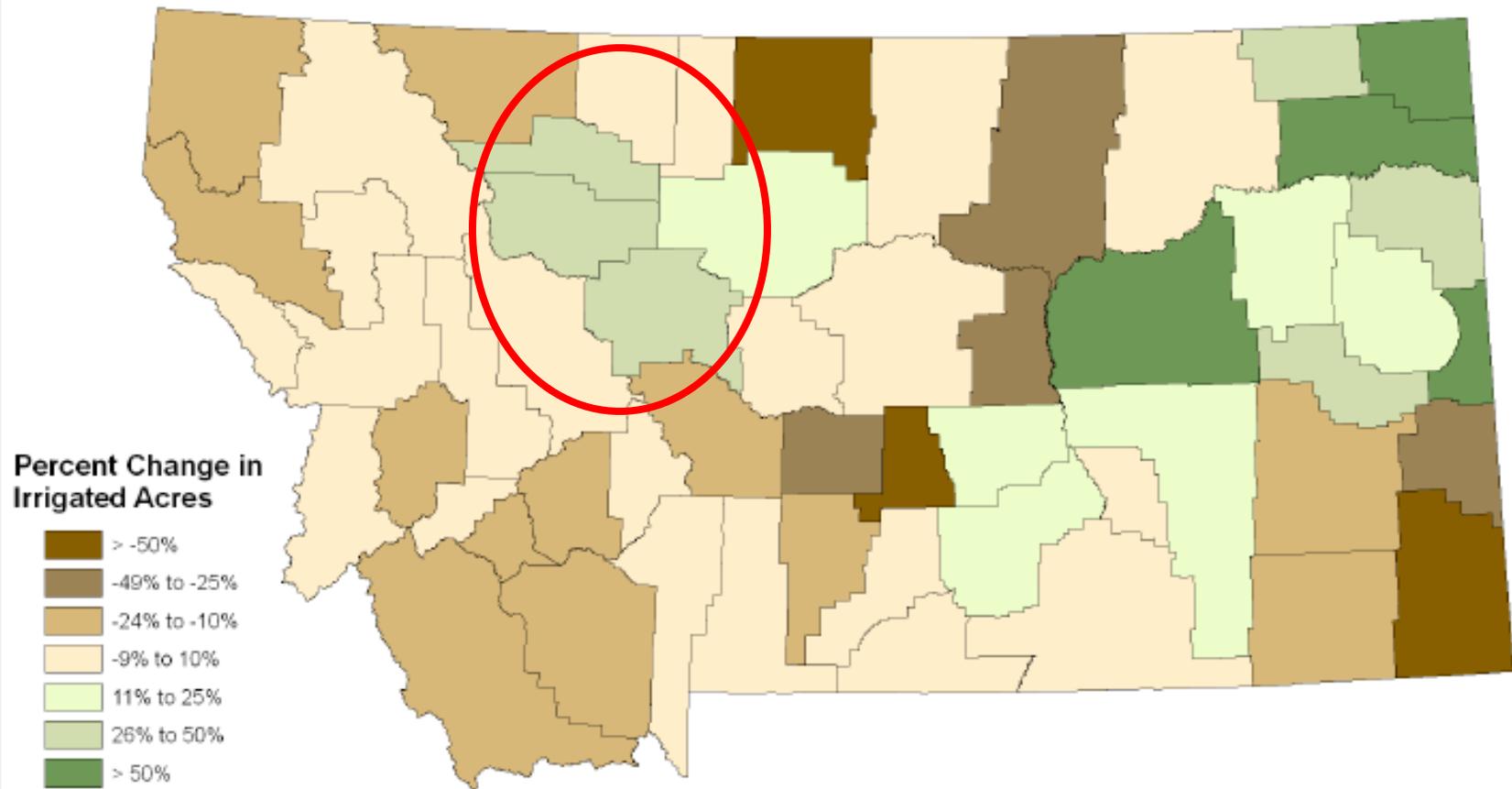
Irrigation Water Challenges



Ruby Reservoir

Rob Kingery, DNRC

Changes in Percent of Irrigated Acres by County: 1987-2002



Source: ECONorthwest, with data from U.S. Department of Agriculture, National Agriculture Statistics Service (2004a). See *Technical Memorandum 2.3 – Net Impacts of Irrigation in Montana* for more detail.

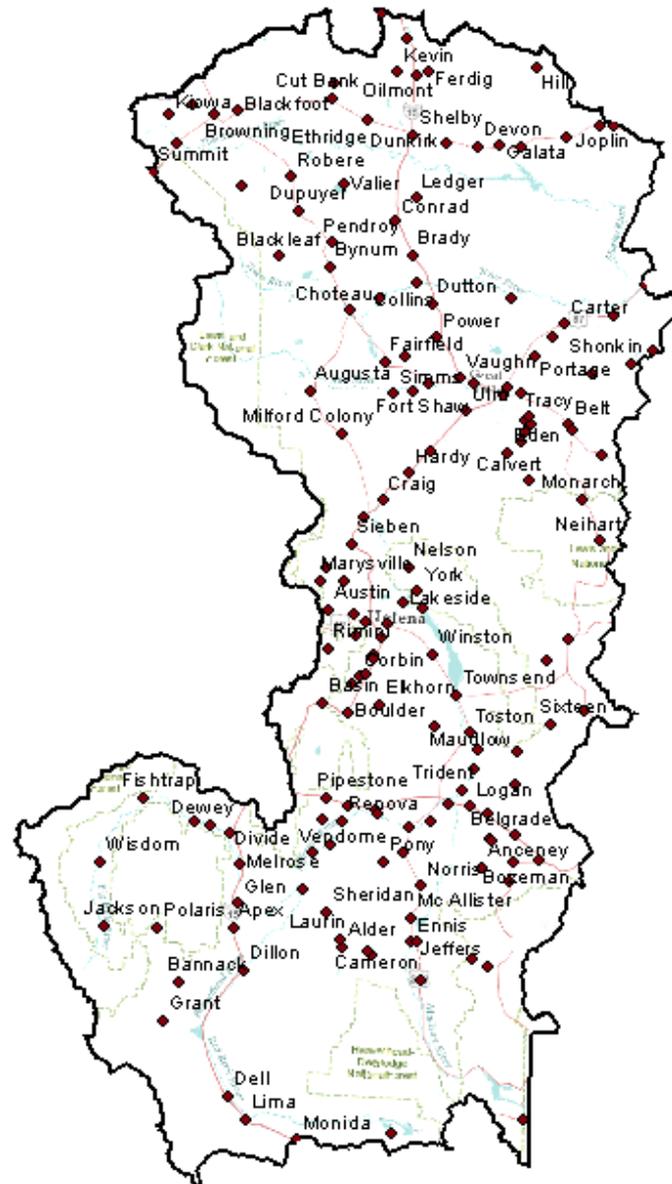
Changing Land Use



Municipal and Domestic Water use



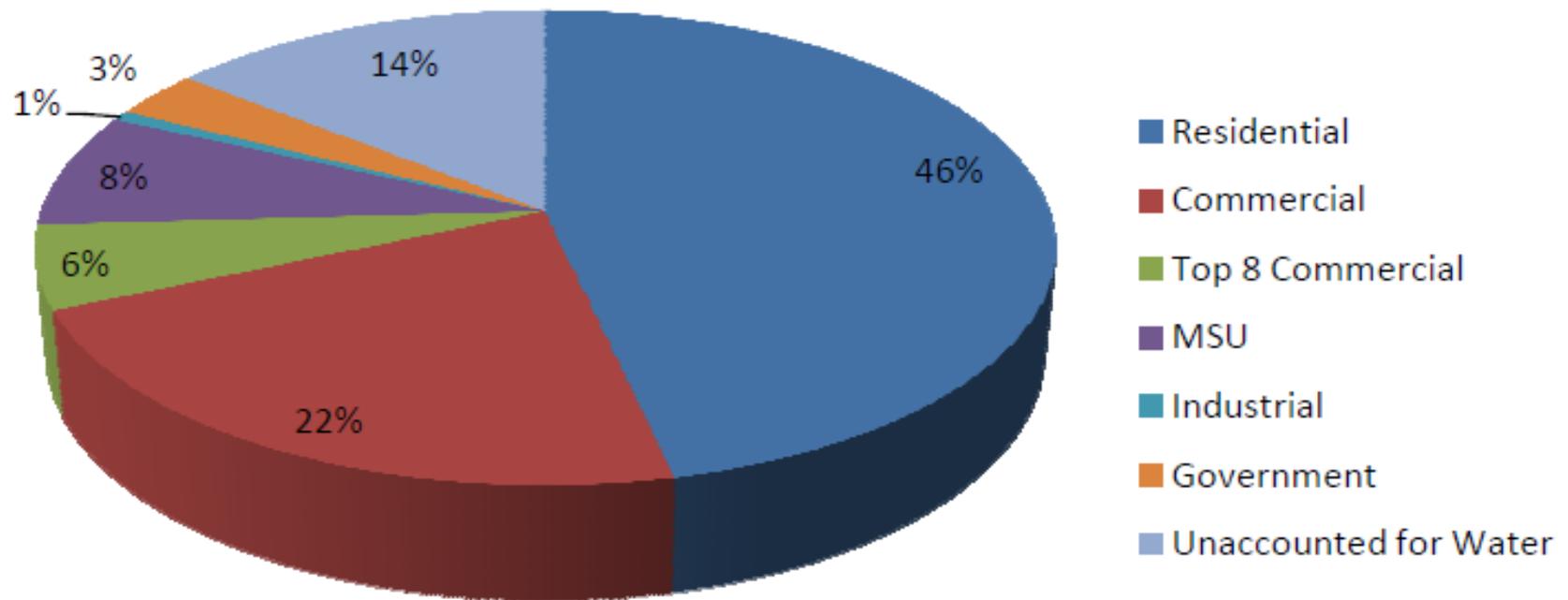
Upper Missouri River Basin Communities



City of Bozeman

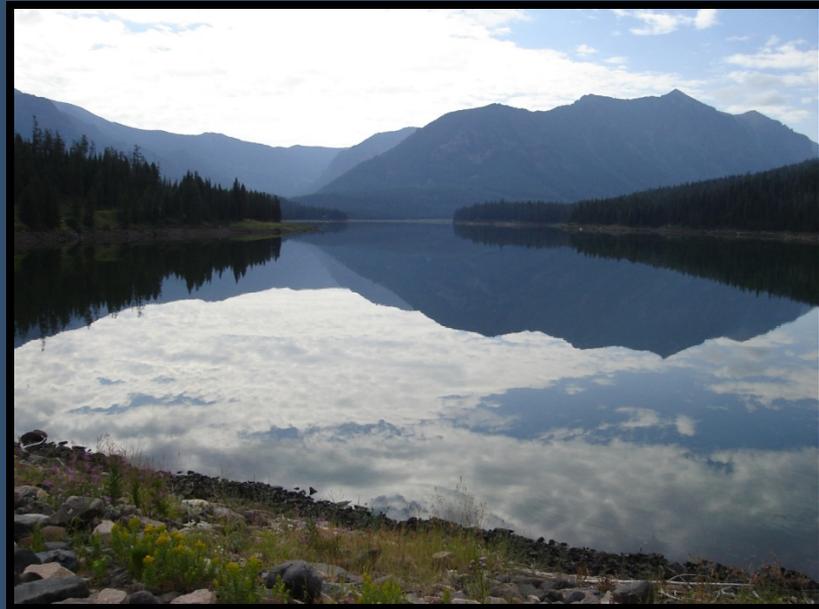
Figure 3-1: Characterization of Total Water Demand by User Class

TOTAL WATER DEMAND



Municipal Water Supply Challenges

- Droughts (other Natural Disasters)
- Winter Freezing Conditions
- Any Times Storage Use Restricted
- Basin Closures



Fish and Wildlife



Mike Roberts, DNRC



46% of all fishing in the state occurs in Upper Missouri Basin

- 1,289,041 angler days
- 483,447 (38%) of these days are by non-resident anglers

Hunting and wildlife watching (statewide)

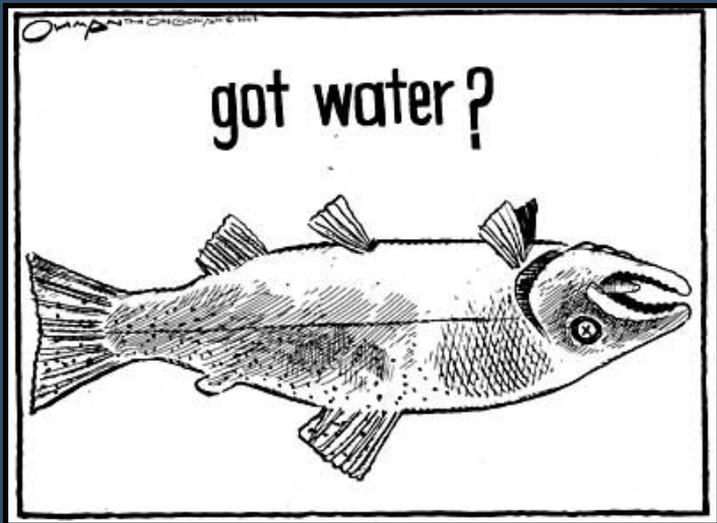
- .5 million people for around 4 million days annually



Habitat, Habitat, Habitat

Key Point: It isn't just about covering fish up with water, or providing water for wildlife to drink....the influence of water on habitat formation and maintenance is critical to fish and wildlife resources

Challenges



Industrial Water Use

- Mining
- Energy (petroleum) production and refining
- Power Generation
 - Hydropower
- Construction
- Non-agricultural food production
- Paper products



MINING AND ENERGY PRODUCTION



Hydropower

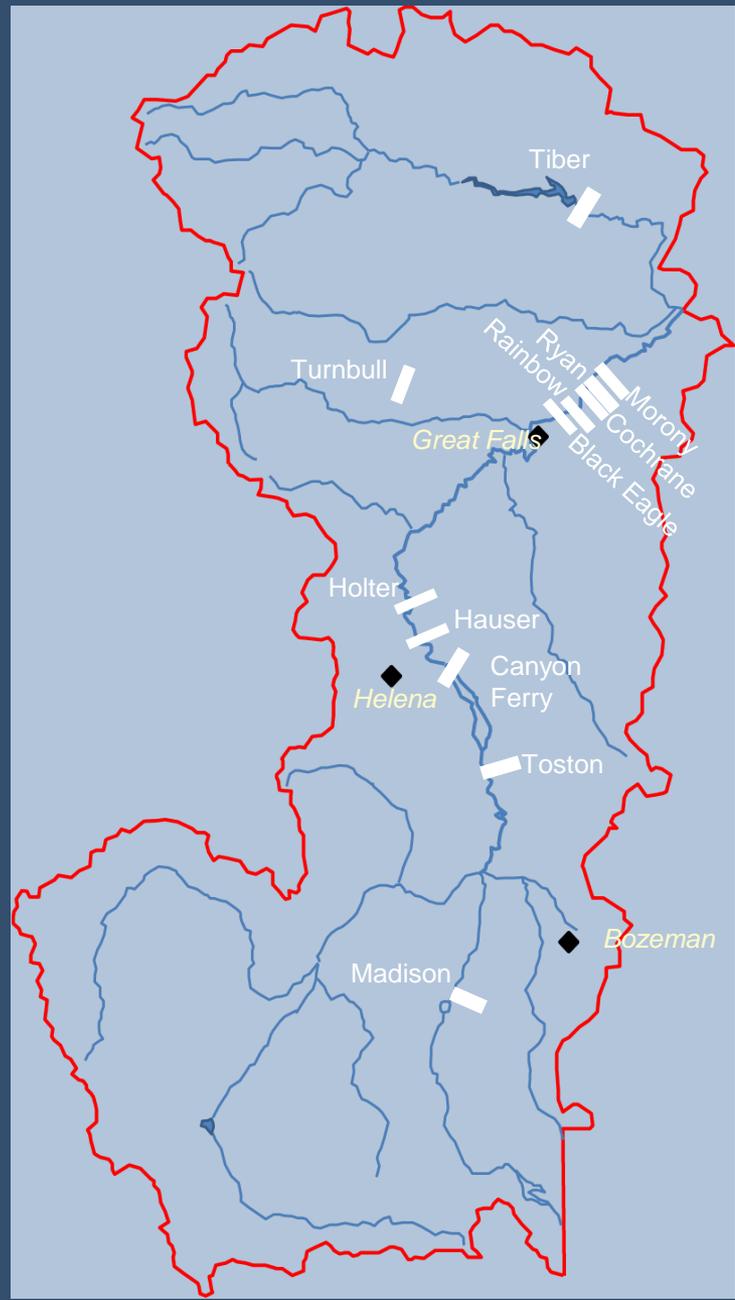


Black Eagle Dam at Great Falls

Major Hydropower Facilities in the Upper Missouri River Basin

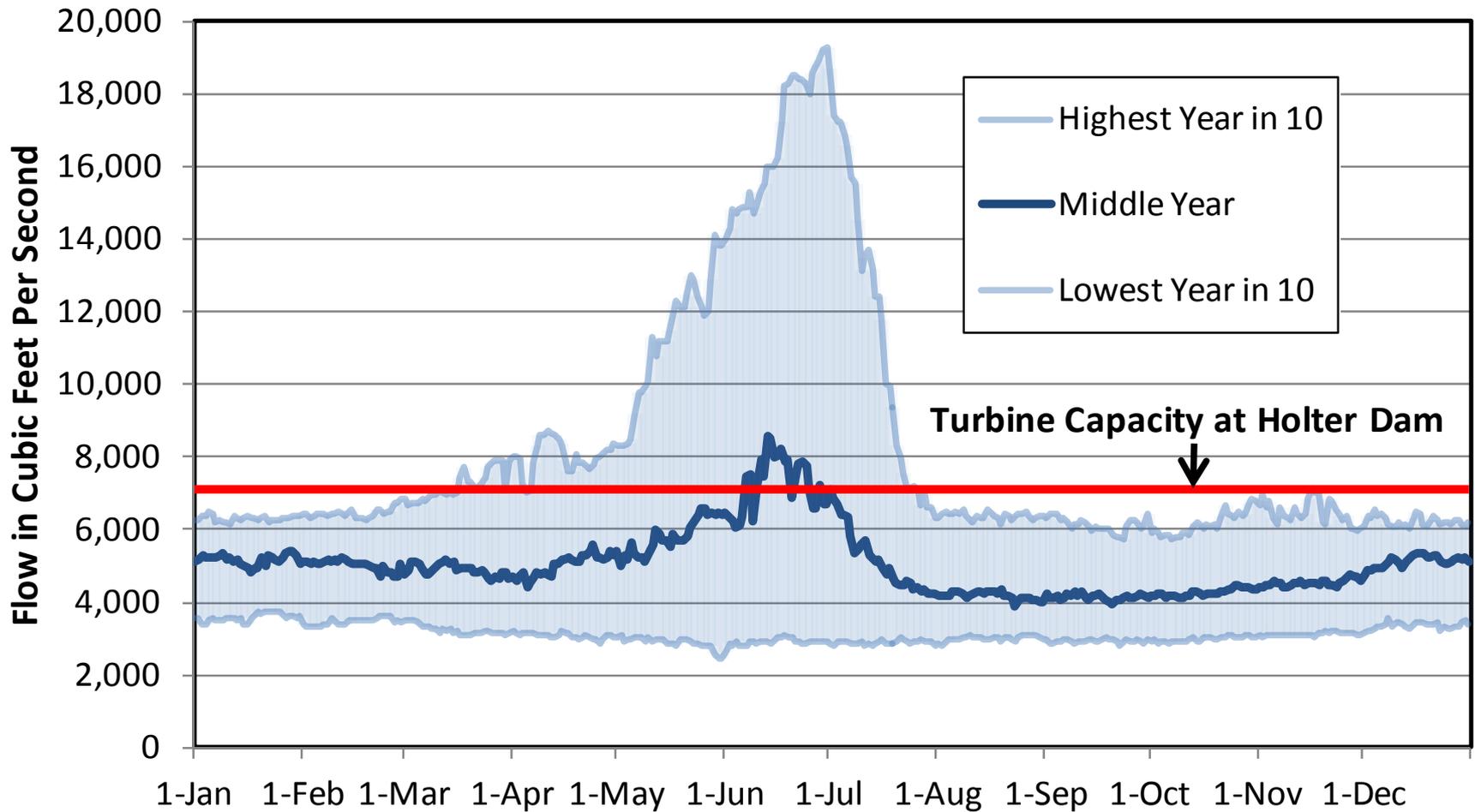
Dam	Stream	Capacity (Megawatts)	Owner or Operator
Madison	Madison River	9	PPL Montana
Toston	Missouri River	10	Montana DNRC
Canyon Ferry	Missouri River	50	U.S. Bureau of Reclamation
Hauser	Missouri River	19	PPL Montana
Holter	Missouri River	48	PPL Montana
Black Eagle	Missouri River	21	PPL Montana
Rainbow	Missouri River	60	PPL Montana
Cochrane	Missouri River	64	PPL Montana
Ryan	Missouri River	60	PPL Montana
Morony	Missouri River	48	PPL Montana
Tiber	Marias River	7.5	Tiber-Montana LLC
Total		396.5	

Major Hydropower Projects

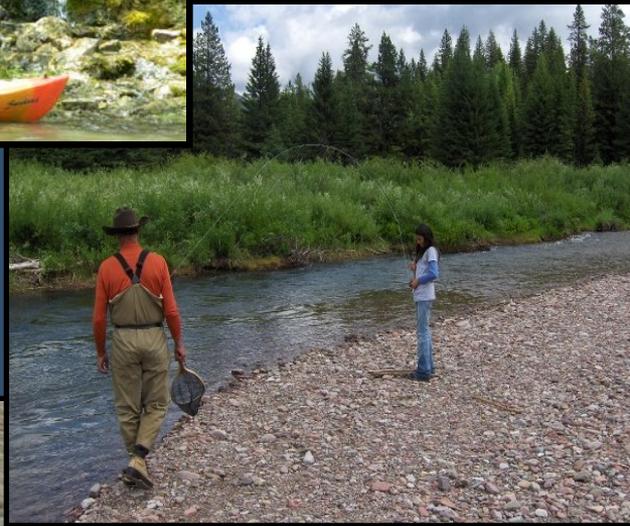


Missouri River below Holter Dam

Normal Range of Flow



Recreation



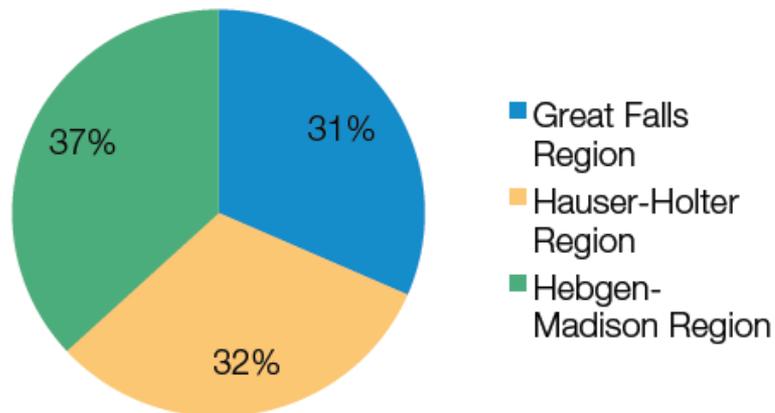
10+ million
visitors a year

come to Montana to hike, fish, ski, bike,
hunt, kayak, boat, and explore

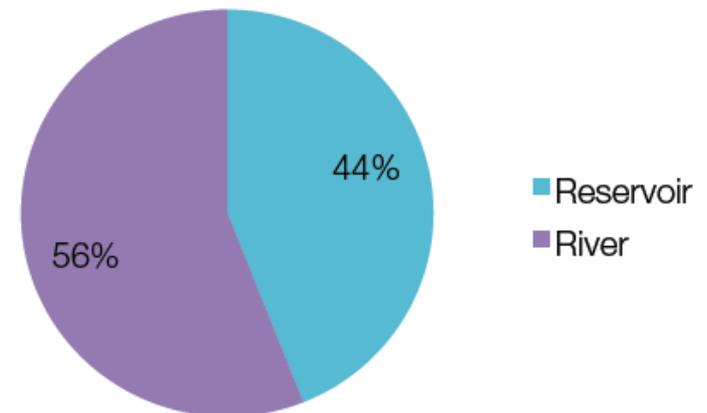
Missouri-Madison Corridor

- 2011: Supported close to 550,000 recreation group visits in the summer

2011 Visitation by Corridor



2011 Visitation, River vs. Reservoir



Motor Boating in Montana since 2000:



Source: US Coast Guard

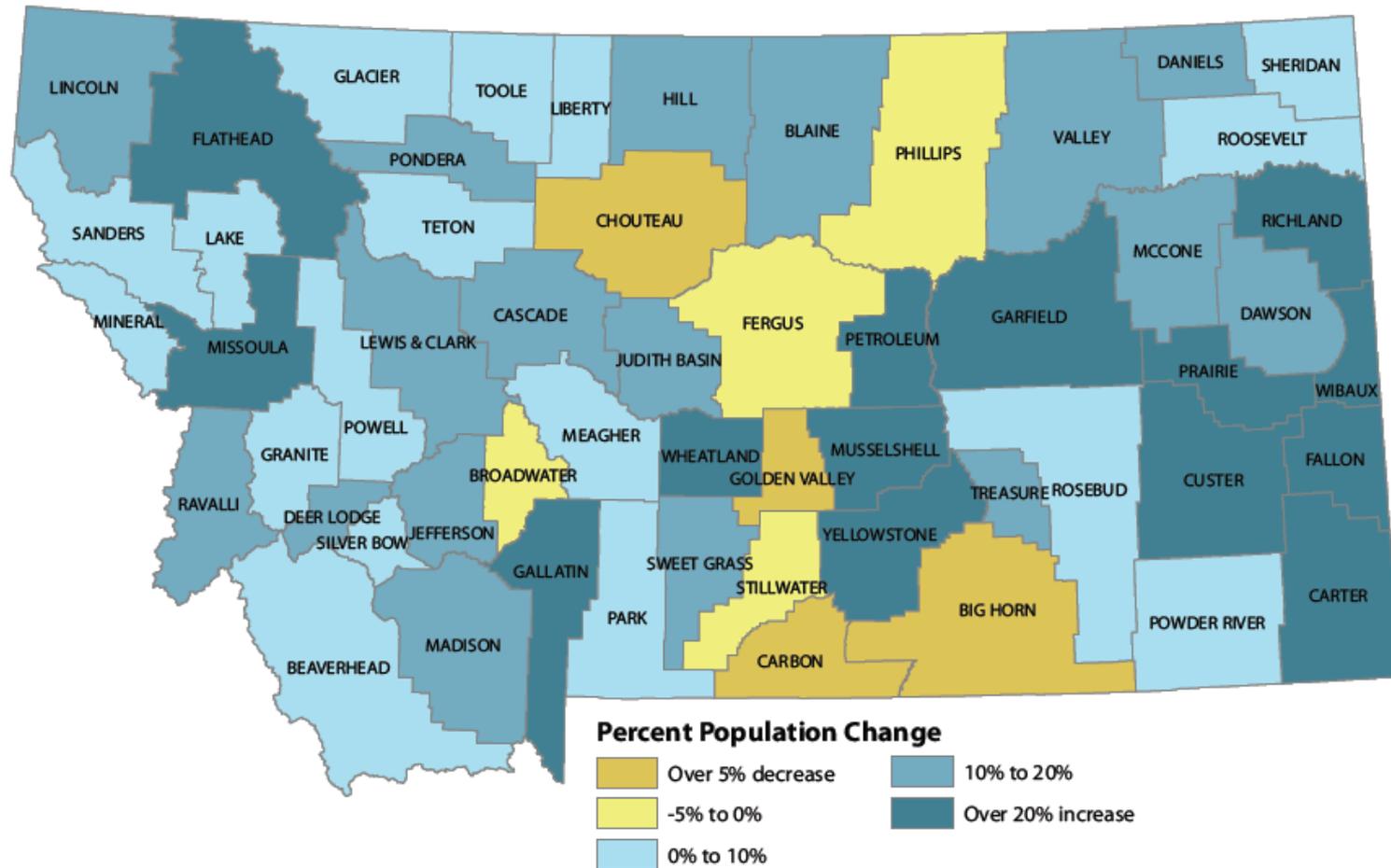
Challenges

- Low flows can impact use:
 - 38% of land managers indicated lake and river boat launches should be increased
 - 45% indicated lake and river access should be increased
 - Water access is a top need for land managers in the next five years
 - Fishing access and facilities are a top need among public



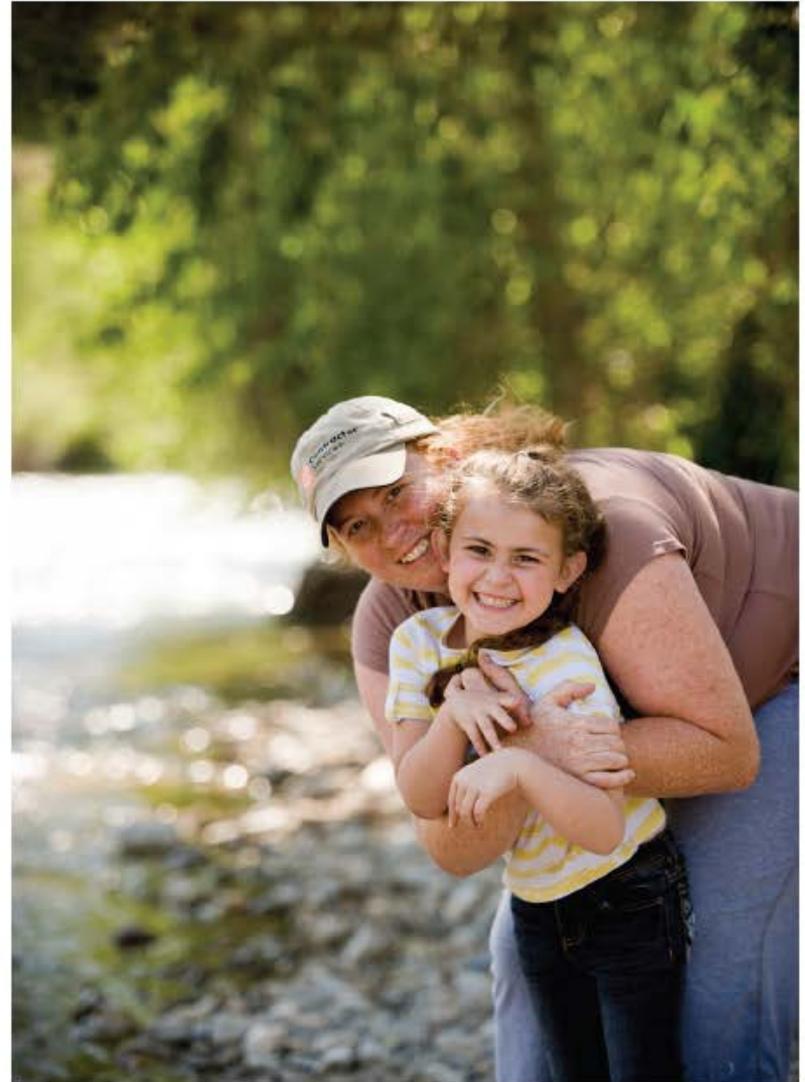
MONTANA POPULATION PROJECTIONS

2010 -2030 Percent Population Change



Looking Forward

- Upper Missouri River Basin is both a recreational treasure and a big tourist destination
- Open space, wildlife, fisheries, clean air, clean water, real Montana communities
- Expect:
 - Tremendous growth in water-related activities outside of fishing
 - Tremendous growth expected for population



What's working well?

Partnerships and Cooperation



Future

- Importance of Proactive Water Supply Planning
- Water in the Bank (Storage, Reservations)
- Maximizing Existing Water
- Improved water measurement and monitoring
- Conservation





Some day I want to make a plan for this river.