2015 Montana Water Supply Initiative

Yellowstone River Basin Plan

A progressive program for:

- ✓ Conservation
- ✓ Development
- ✓ Utilization
- ✓ Sustainability

State Water Plan §85-1-203 MCA

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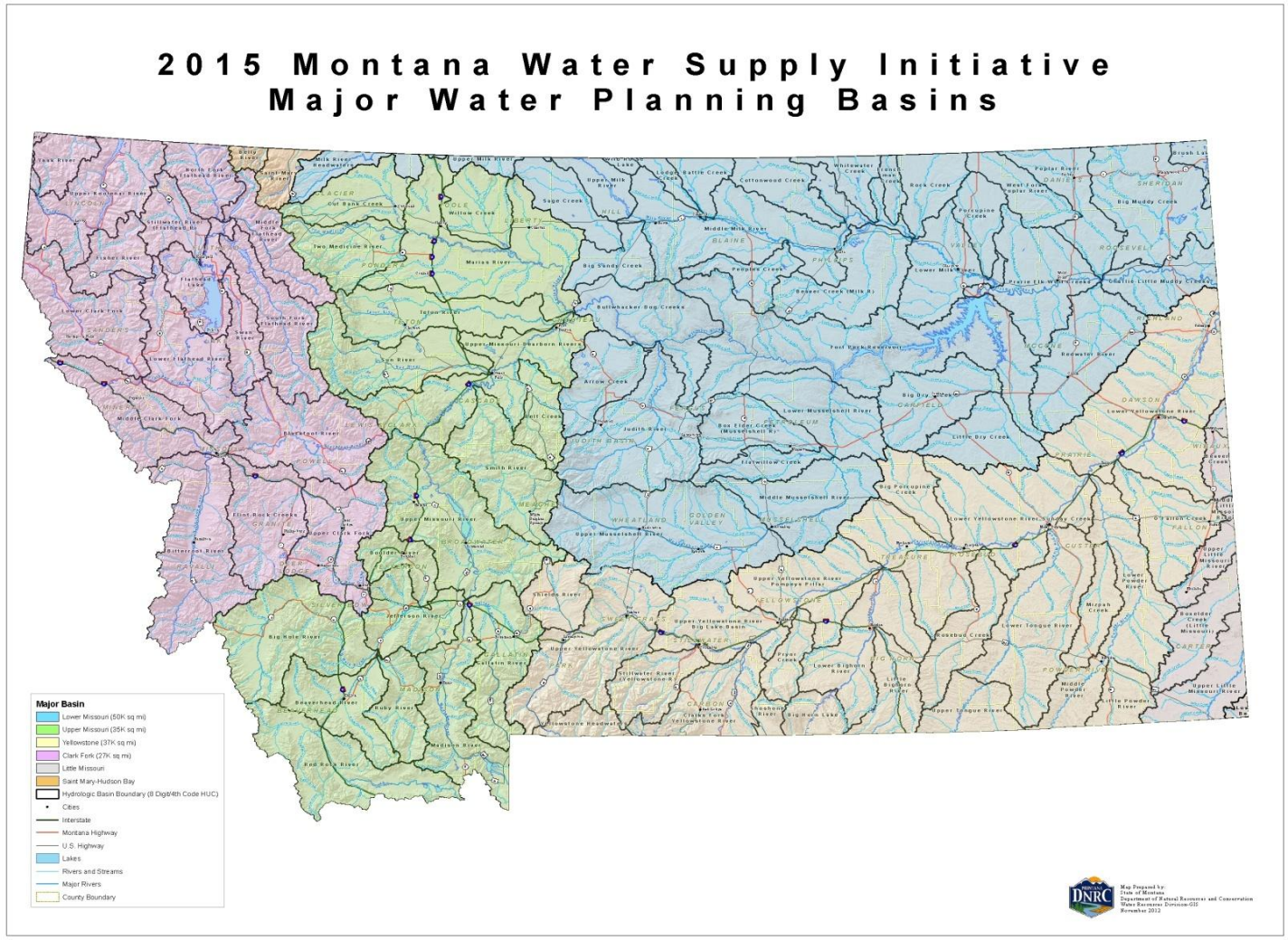
2015 Montana Water Supply Initiative

Yellowstone River Basin



2015 Montana Water Supply Initiative

Yellowstone River Basin

Attachment "4"

Montana Water Supply Intitiative 2015
Yellowstone River Basin Plan

		Description:	Responsible Party	JAN-2013	FEB-2013	MAR-2013	APR-2013	MAY-2013	JUN-2013	JUL-2013	AUG-2013	SEP-2013	OCT-2013	NOV-2013	DEC-2013	JAN-2014	FEB-2014	MAR-2014	APR-2014	MAY-2014	JUN-2014	JUL-2014	AUG-2014	SEP-2014	OCT-2014	NOV-2014	DEC-2014
Phase 1 - Scoping and Issue Identification		Establish BACs, Public Outreach and Education Campaign, and Water Issues Identification																									
	1	Statewide public outreach, education and citizen engagement	DNRC and MT Watercourse												♦												♦
	2	Yellowstone BAC member recruitment	DNRC			♦																					
	3	Compile water information for purposes of education and public scoping	DNRC/ Contractor												♦												
	4	Basin Advisory Council scoping meetings	DNRC/BAC			♦	♦	♦																			
	5	Development and Publication of Critical Issues (Scoping) Report	DNRC and BAC								♦																
Phase 2 - Tech Studies and Feedback		Technical Studies (inventories, surveys, analysis, etc.) and Alternatives Development																									
	1	Survey Opinions of Water Users (include results in Scoping Report)	DNRC/ Contractor								♦																
	2	Review water issues identified and screened through the BAC	DNRC/ Contractor																								
	3	Identify, compile and analyze existing water resource information relevant to identified issues	DNRC																								
	4	Identify data gaps, prepare alternatives, and draft recommendations for consideration by BAC	DNRC/ Contractor														♦										
Phase 3 - Recommendations and Plan Development		Recommendations and Basin Plan Development																									
	1	Communicate technical results and present draft alternatives and recommendations	DNRC/ Contractor																	♦							
	2	Basin Advisory Council Recommendation Development meetings	DNRC/ Contractor															♦	♦	♦							
	3	Finalize draft Yellowstone basin plan	DNRC/ Contractor																		♦						
	4	Present draft state water plan to DNRC Director	DNRC																				♦				
	5	Present draft state water plan to EQC and WPIC	DNRC																						♦		
	6	Present state water plan to 2015 Legislature	DNRC																								♦

♦ Deadline

2015 Montana Water Supply Initiative

Yellowstone River Basin Plan

Goal of Water Planning (Why do we plan?)

Answer: To Improve availability

Historic
Appropriators
(Tribes, Agriculture, Towns)

Recreation

Development

Habitat

2015 Montana Water Supply Initiative

Yellowstone River Basin Plan

What are the objectives?

✓Document current beneficial uses and demands for water.
(How much water do we use for both consumptive and nonconsumptive uses?)

✓Forecast increases in demand for water over the next 20 years.
(How much will we use in the future?)

✓Identify sources of water to meet increases in demand while protecting existing beneficial uses. (How do we meet future demand?)

✓Provide recommendations to the 2015 Montana Legislature on how Montana can meet future water needs.

✓Provide guidance to DNRC in prioritizing its resources and carrying out its duties.

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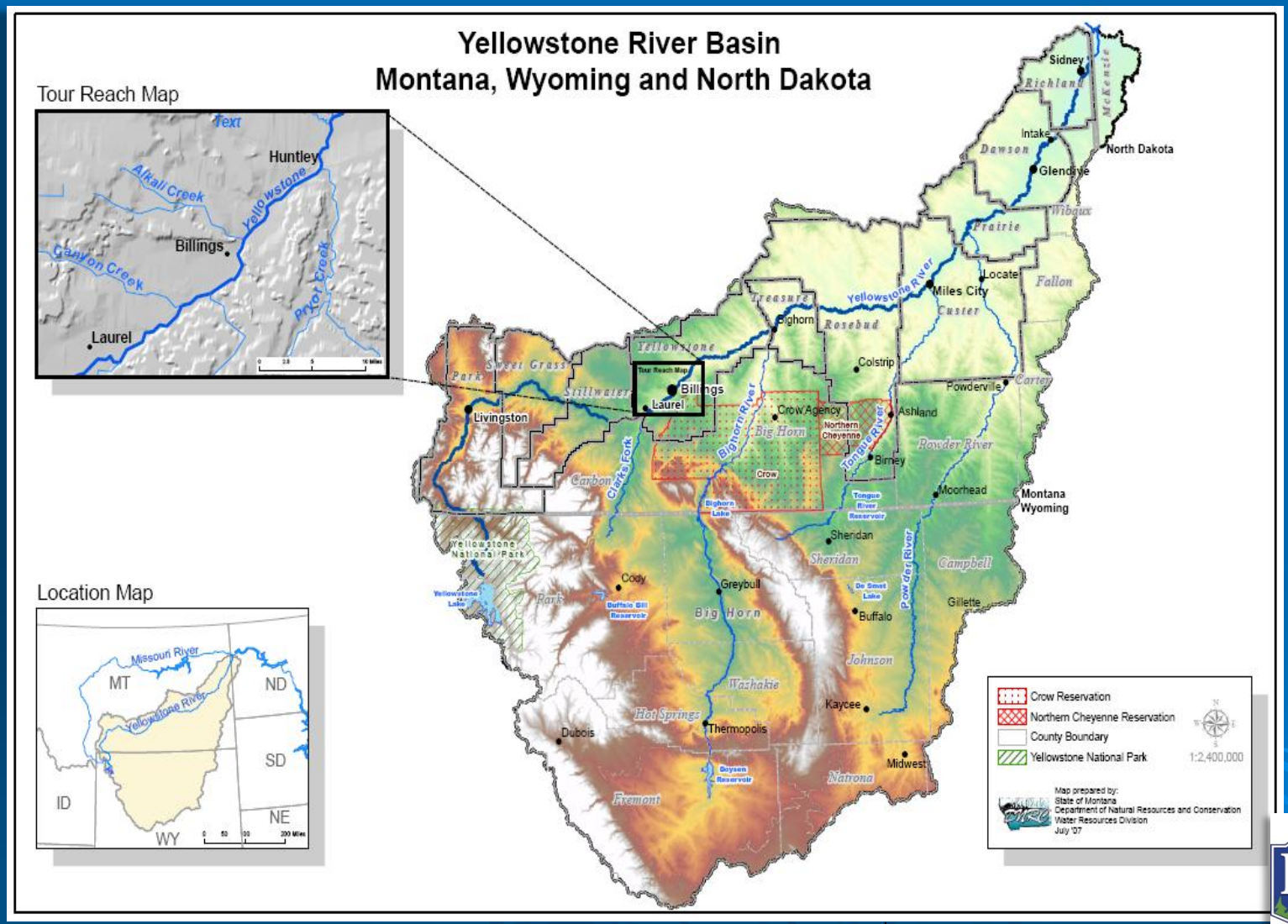
Yellowstone River Basin



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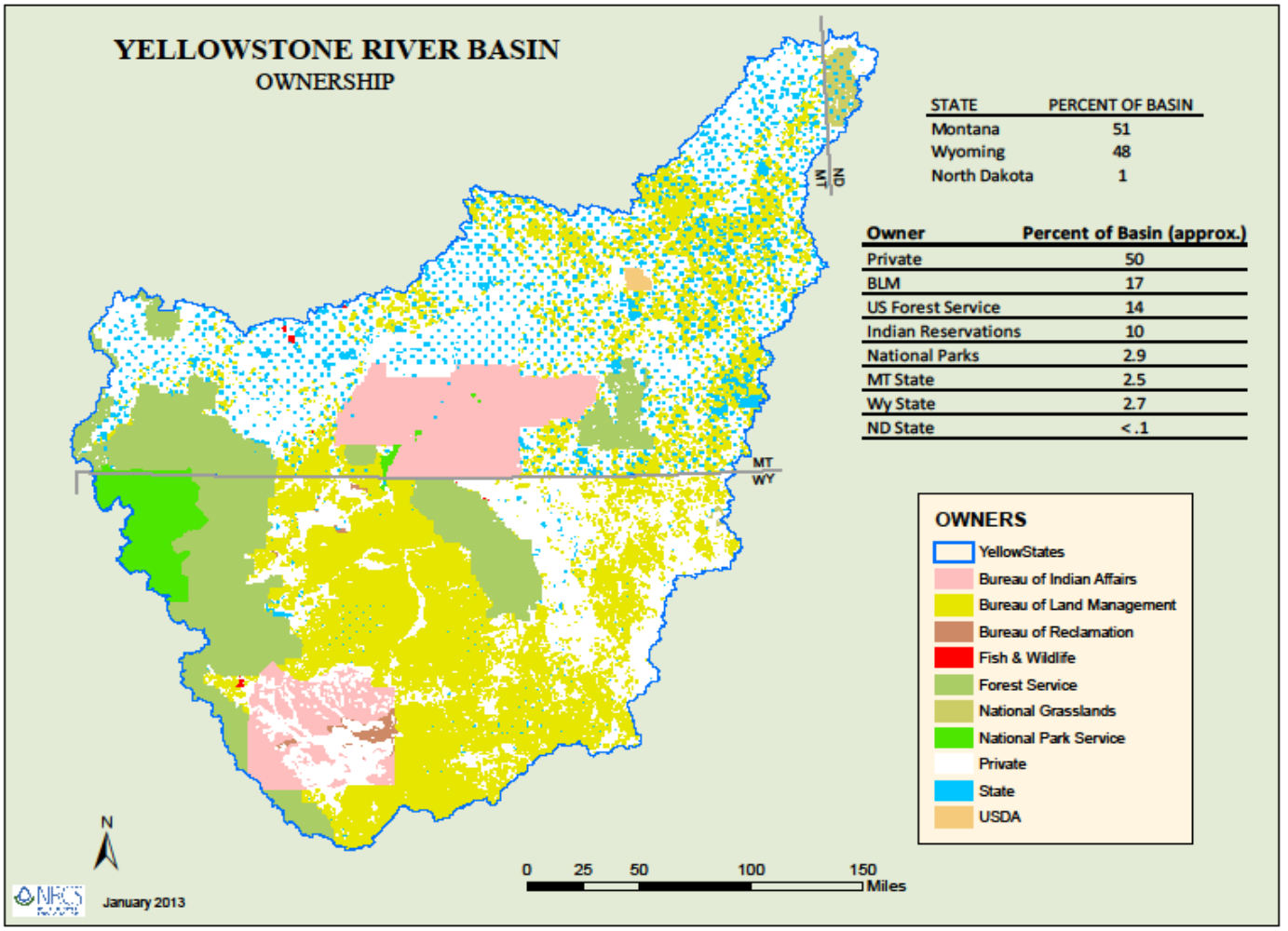
Yellowstone River Basin



STATE	PERCENT OF BASIN
Montana	51
Wyoming	48
North Dakota	1

Owner	Percent of Basin (approx.)
Private	50
BLM	17
US Forest Service	14
Indian Reservations	10
National Parks	2.9
MT State	2.5
Wy State	2.7
ND State	<.1

OWNERS

- YellowStates
- Bureau of Indian Affairs
- Bureau of Land Management
- Bureau of Reclamation
- Fish & Wildlife
- Forest Service
- National Grasslands
- National Park Service
- Private
- State
- USDA

2015 Montana Water Supply Initiative
Yellowstone River Basin

What are the issues?

- ✓ Water Availability and Allocation (Development Obstacles?)
- ✓ Drought (Climate Variability)
- ✓ Water Storage Opportunities (Where?)
- ✓ Floodplains, Riparian Zones, and Streambanks
- ✓ Water Quality, Pollution and Beneficial Use
- ✓ Interstate Water Allocation (50% of the Basin in WY)
- ✓ Need for More and Better Water Information

Results from MT Water Center Survey

(AWRA Meeting October 2012)

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Yellowstone River Basin

History of Water Planning in MT

- **Pre-1965 – Water Project Development Era**
  - US Bureau of Reclamation (1902)
  - MT Water Resources Board (1933)
- **1965 -1981 – Basin Planning Era I**
  - 1965- Federal Water Resources Planning Act, Basin Commissions, Level "B" Studies
  - 1967- MT Water Resources Act 'state water plan'
  - 1981- Federal funding ended
- **1987-1999 – Section Planning Era**
  - Issue Oriented
  - Focus on State-wide Policy Development
- **1999 – 2012 – Watershed Planning Era**
  - Support of local watershed groups
- **2009 – Present – Basin Planning Era II**
  - Established BACs and Specific Objectives

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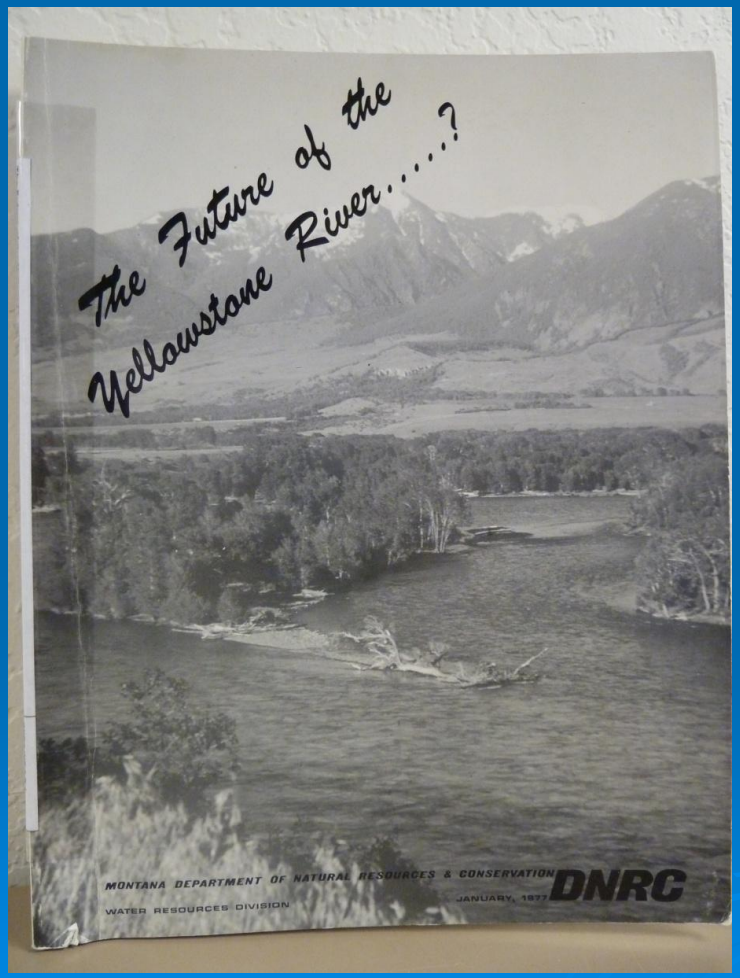
Yellowstone River Basin Plan

1976



- Preference Rating for Water Users
- Adjudication and Defense of Water Rights
- Moratorium Extension
  (Water Moratorium Act of 1974)
- Water Storage (Tongue and Powder)
  1. Joint Studies with WY
  2. Investigate Water Marketing
  3. Study WQ effects on storage, conveyance and irrigation
- Coal and Power Generation
- Yellowstone Compact

2015 Montana Water Supply Initiative

Yellowstone River Basin

Yellowstone River Basin

Text Size

Yellowstone Impact Study Prepared for the Old West Regional Commission, July 1977

The Yellowstone Impact Study, conducted by the Water Resources Division of the Montana Department of Natural Resources and Conservation and financed by the Old West Regional Commission, was designed to evaluate the potential physical, biological and water use impacts of water withdrawals and water development on the middle and lower reaches of the Yellowsone River Basin in Montana. The study's plan of operation was to project three possible levels of future agricultural, industrual and municipal development in the Yellowstone Basin and the streamflow depletions associated with that development. Impacts on river morphology and water quality were then assessed and finally the impacts of altered streamflow, morphology and water quality on such factors as migratory birds, furbearers, recreation and existing water users were analyzed.

The study began in the fall of 1974. By its conclusion in December of 1976, the information generated by the study had already been used for a number of moratorium-related projects — the EIS on reservations of water in the Yellowstone Basin, for example (Montana DNRC 1976). The study resulted in a final report summarizing all aspects of the study and in eleven specialized technical reports:

Report No. 1	Future Development Projections and Hydrologic Modeling in the Yellowstone River Basin, Montana
Report No. 2	The Effect of Altered Streamflow on the Hydrology and Geomorphology of the Yellowstone River Basin, Montana
Report No. 3	The Effect of Altered Streamflow on the Water Quality of the Yellowstone River Basin, Montana
Report No. 4	The Adequacy of Montana's Regulatory Framework for Water Quality Control
Report No. 5	Aquatic Invertebrates of the Yellowstone River Basin, Montana
Report No. 6	The Effect of Altered Streamflow on Furbearing Mammals of the Yellowstone River Basin, Montana
Report No. 7	The Effect of Altered Streamflow on Migratory Birds of the Yellowstone River Basin, Montana
Report No. 8	The Effect of Altered Streamflow on Fish of the Yellowstone and Tongue Rivers, Montana
Report No. 9	The Effect of Altered Streamflow on Existing Municipal and Agricultural Users of the Yellowstone River Basin, Montana
Report No. 10	The Effect of Altered Streamflow on Water-Based Recreation in the Yellowsone River Basin, Montana
Report No. 11	The Economics of Altered Streamflowin the Yellowstone River Basin, Montana

Yellowstone Impact Study

Sponsor: Old West Regional Commission

(1974 – 1976)

dnrc.mt.gov/mwsi

Yellowstone River CEA

Sponsors: YRCDC and US COE

(2004-present)

nris.mt.gov/yellowstone

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2015 Montana Water Supply Initiative

Yellowstone River Basin

State Water Planning 1987 – 2005

Part I: Background and Evaluation:

- State Water Plan Development: A Revised Approach (1987)
- Montana State Water Plan Handbook (1993)
- State Water Plan Implementation Update (1993)
- State Water Plan Evaluation (1994)

dnrc.mt.gov/mwsi

Part II: Plan Sections:

- Agricultural Water Use Efficiency (1989)
- Instream Flow Protection (1989)
- Federal Hydropower Licensing and State Water Rights (1989)
- Water Information System (1989)
- Water Storage (1990)
- Drought Management (1990)
- Integrated Water Quality and Quantity Management (1992)
- Upper Clark Fork River Basin Water Management Plan (1994)
- Montana Groundwater Plan (1999)
- Clark Fork Basin Water Management Plan (2005)

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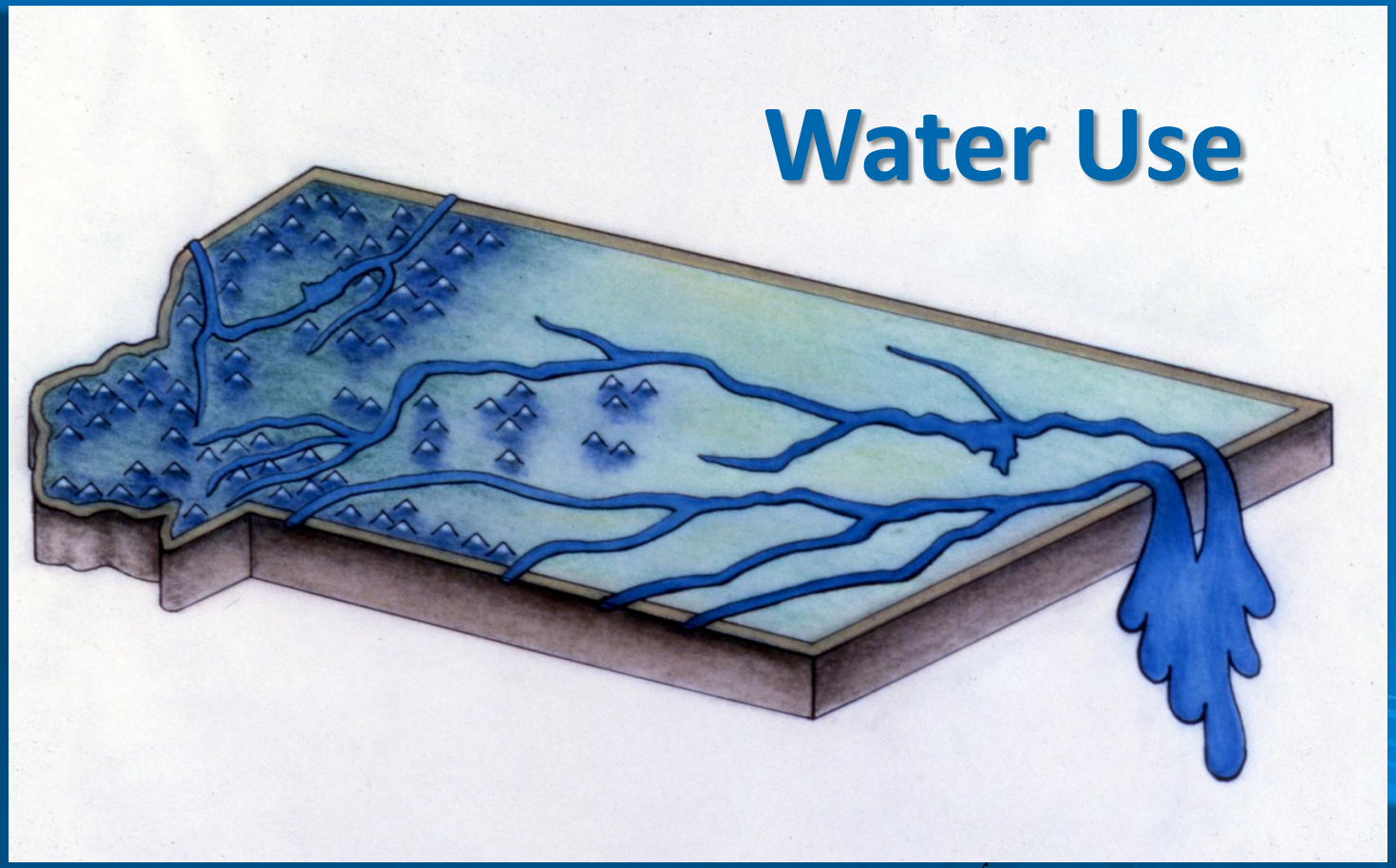
Yellowstone River Basin



2015 Montana Water Supply Initiative

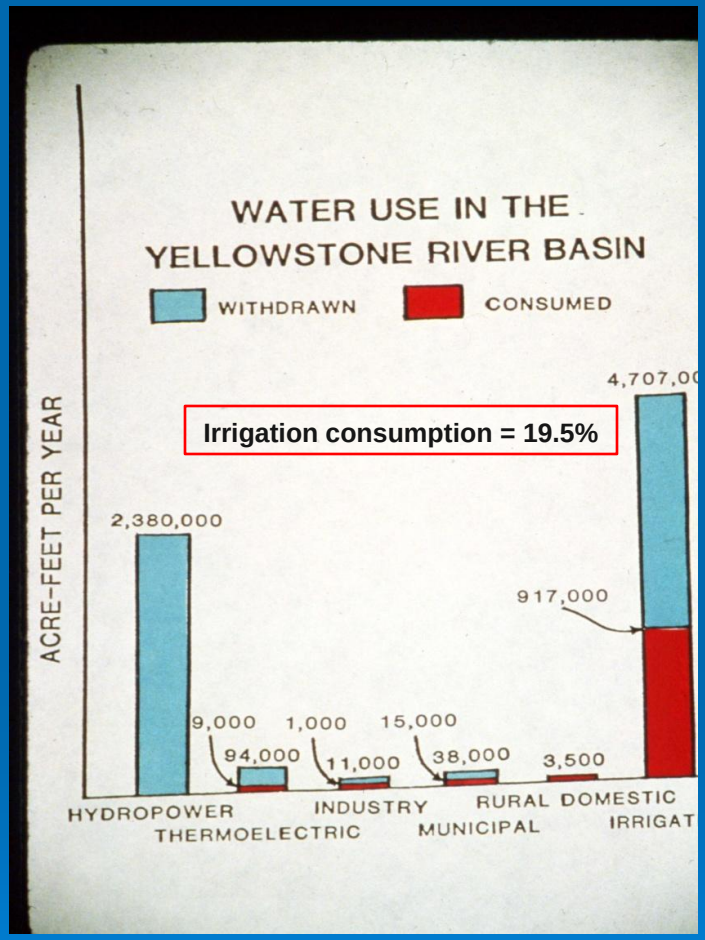
Yellowstone River Basin

Major Categories of Water Use:

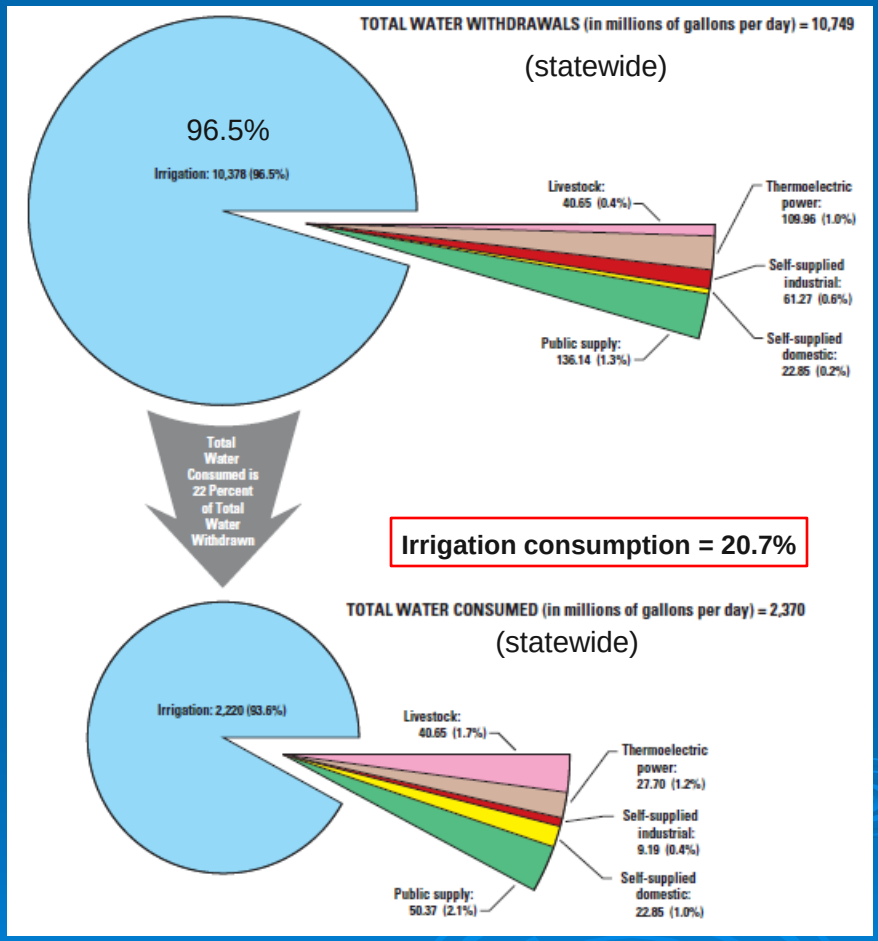
- **Instream**
  - hydroelectric power generation
  - fish and wildlife habitat
  - recreation
  - navigation
  - water quality maintenance
- **Irrigation**
- **Public Supply**
- **Self-supplied Domestic**
- **Self-supplied Industrial**
- **Thermo-electric Power Generation**

2015 Montana Water Supply Initiative

Yellowstone River Basin



1970's



USGS from 2000 data

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Yellowstone River Basin

WATER CONSUMED ANNUALLY

(1000 acre-feet per year)

USE	CONSUMPTION	PERCENT OF TOTAL
RESERVOIR EVAPORATION	3,925	53.80%
IRRIGATION	3,250	44.55
MUNICIPAL	58	.80
LIVESTOCK	28	.38
RURAL DOMESTIC	17	.23
INDUSTRY	9	.12
THERMOELECTRIC	9	.12

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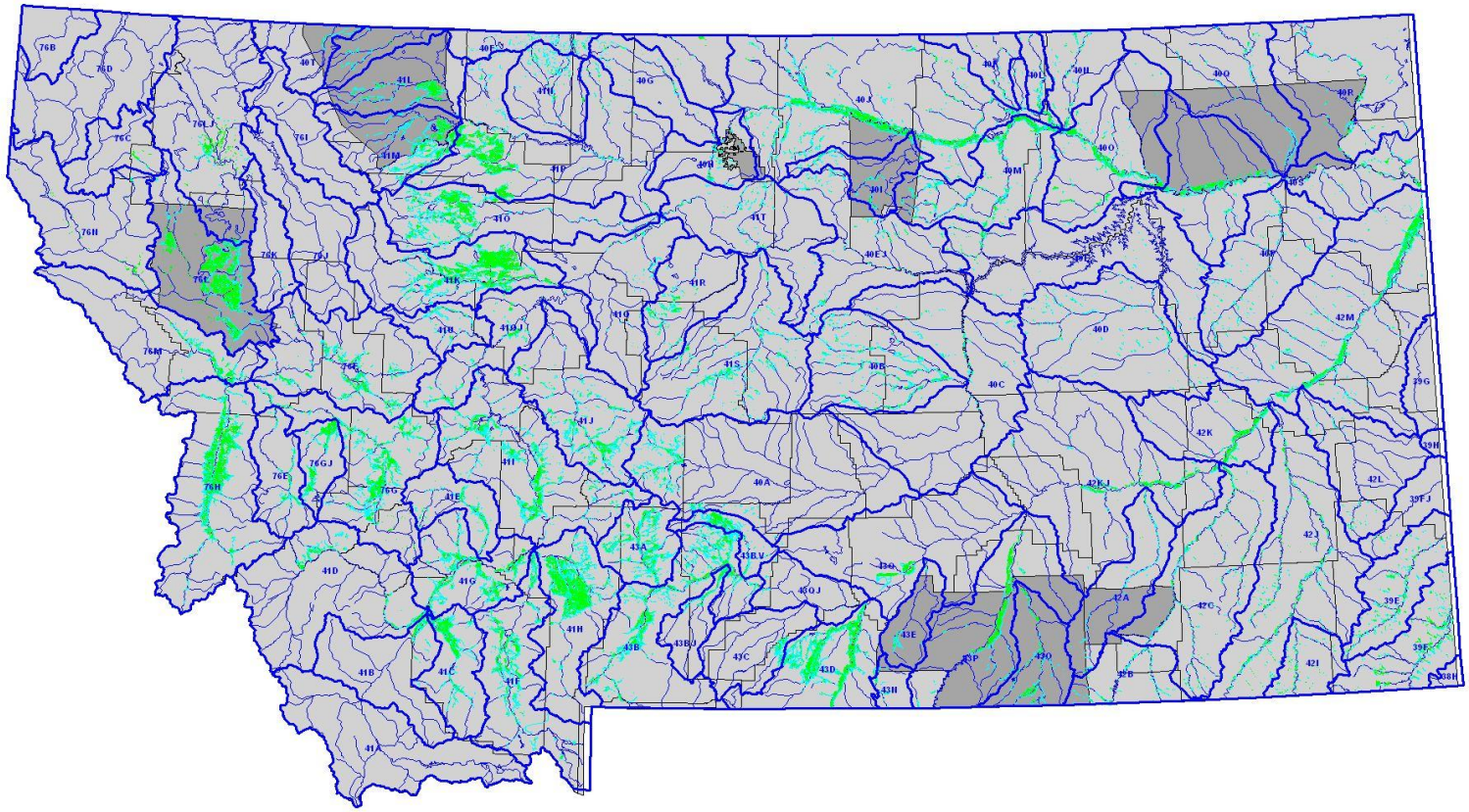
Yellowstone River Basin

Irrigated lands in Montana ~ 2 million acres



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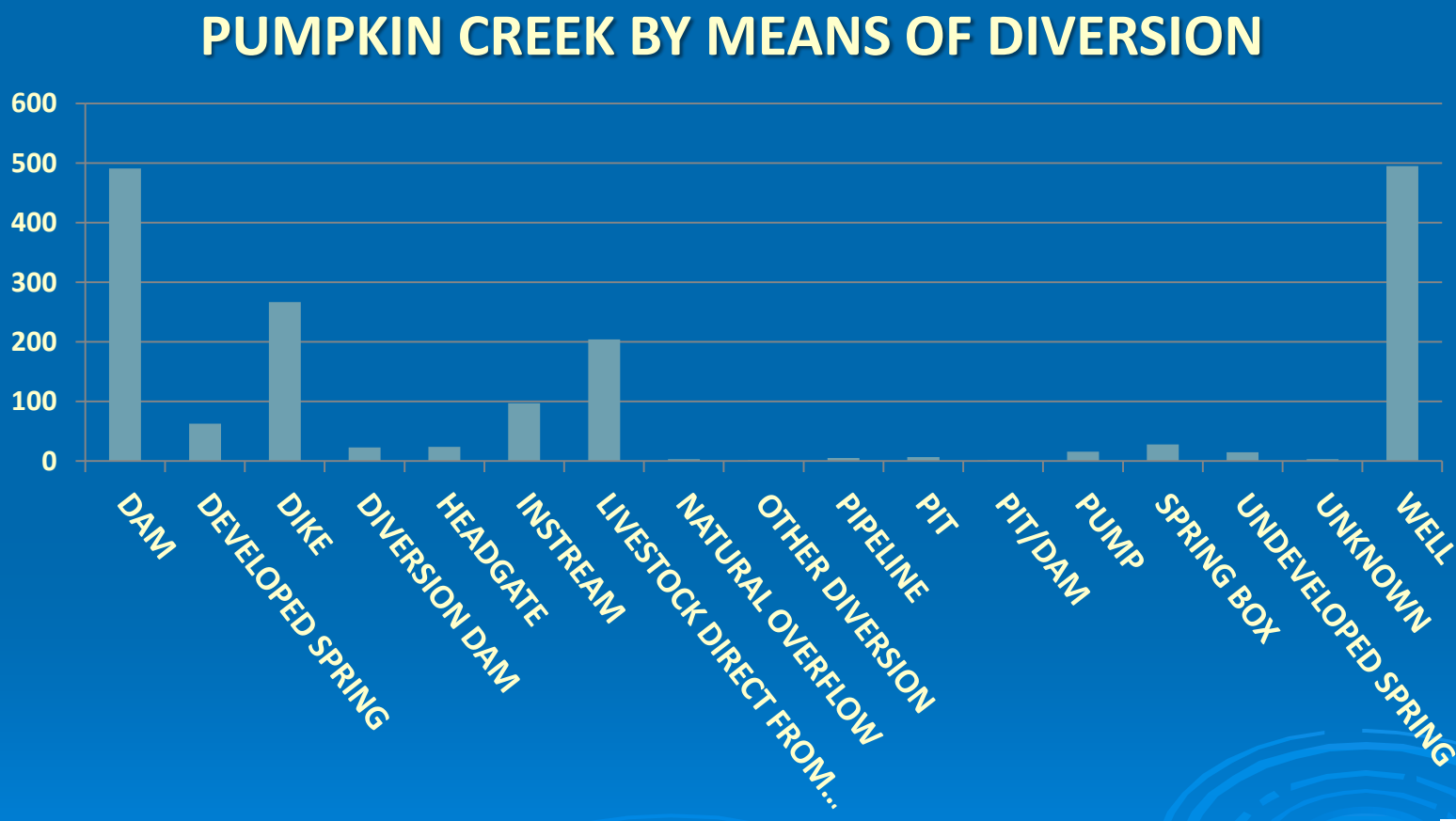
Yellowstone River Basin



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Yellowstone River Basin

Pumpkin Creek Irrigated Lands:

From adjudication data (acres)

Claimed =	14,640
Examined =	13,670
WRS =	10,432 (Custer 1948, Powder River 1961)

From DOR FLU data (acres)

flood =	94
pivot =	2
sprinkler =	0
Total =	96

2015 Montana Water Supply Initiative
Yellowstone River Basin

Future Demand?
(How much will we use in the future?)

- Agriculture
- Residential
- Industry (Energy Production)
- Instream

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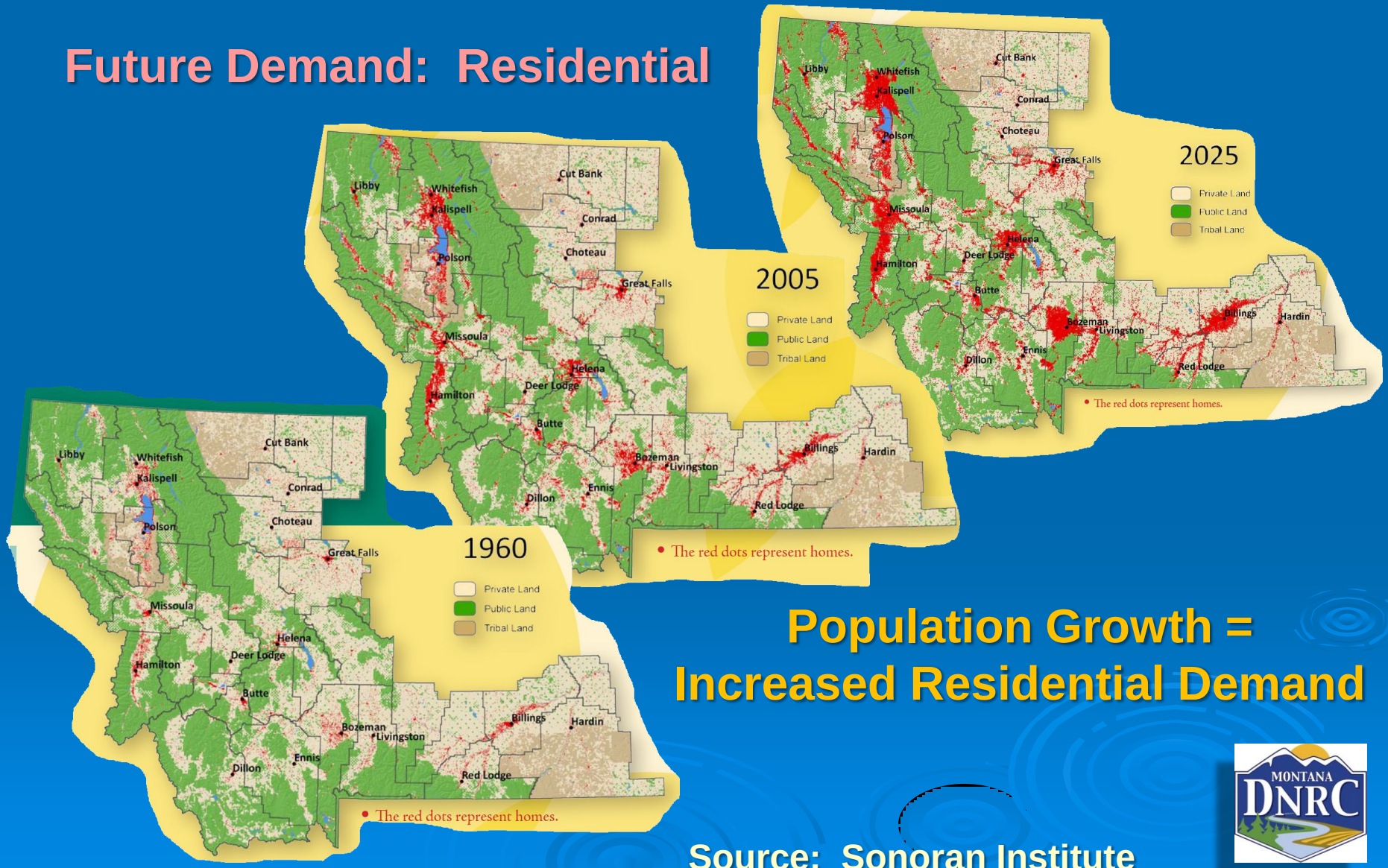
Yellowstone River Basin

Future Demand: Residential



Population Growth = Increased Residential Demand

Source: Sonoran Institute

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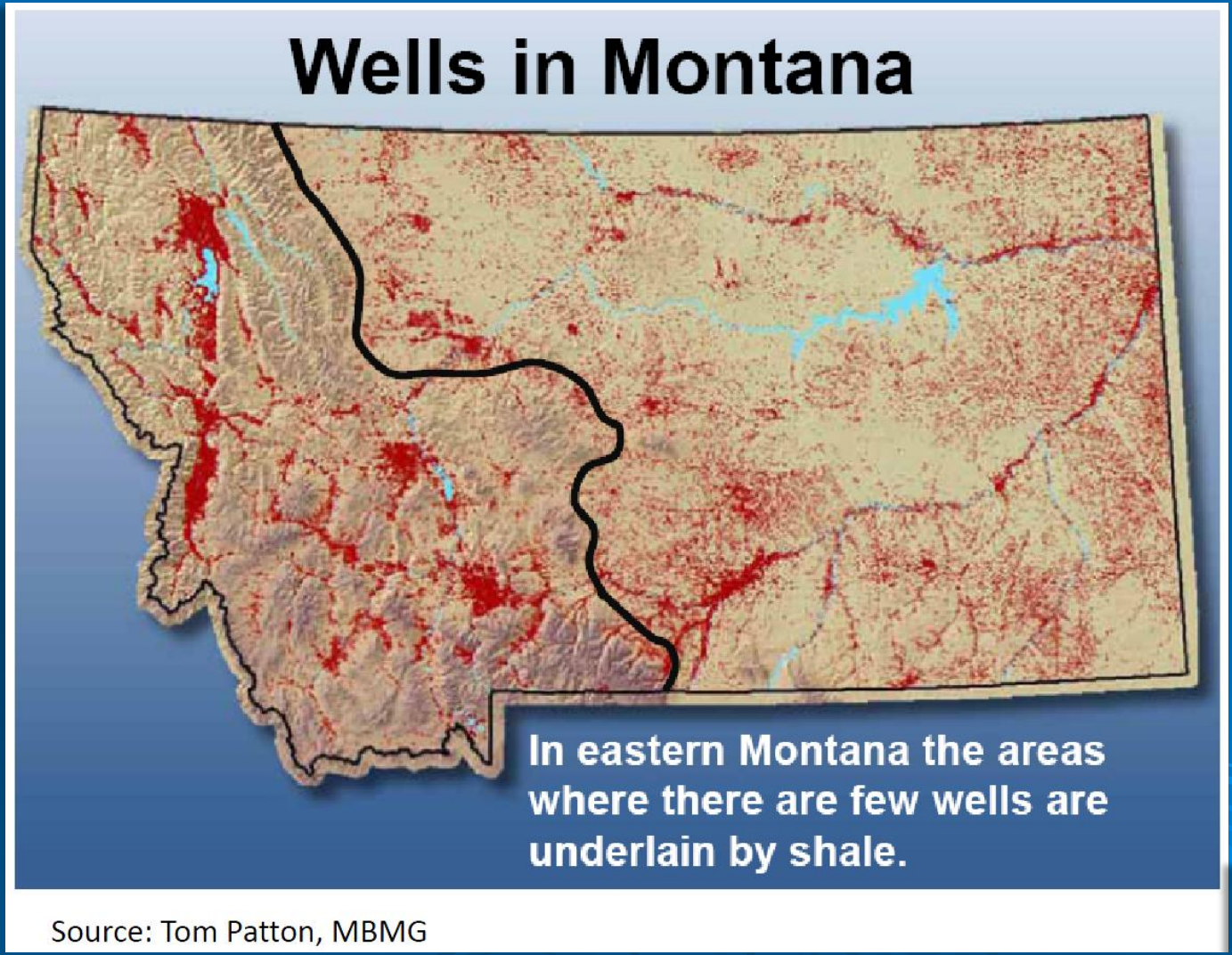
Yellowstone River Basin



Source: Tom Patton, MBMG

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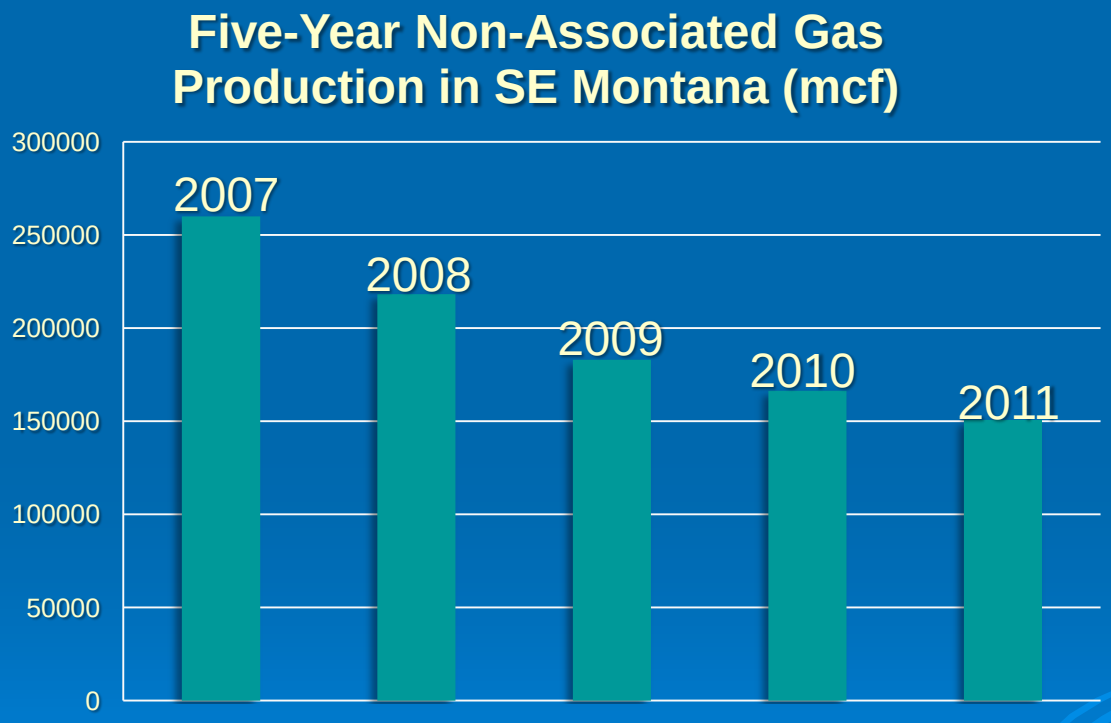
Yellowstone River Basin

Future Demand: Petroleum Production?



Source: DNRC 2012 Annual Report

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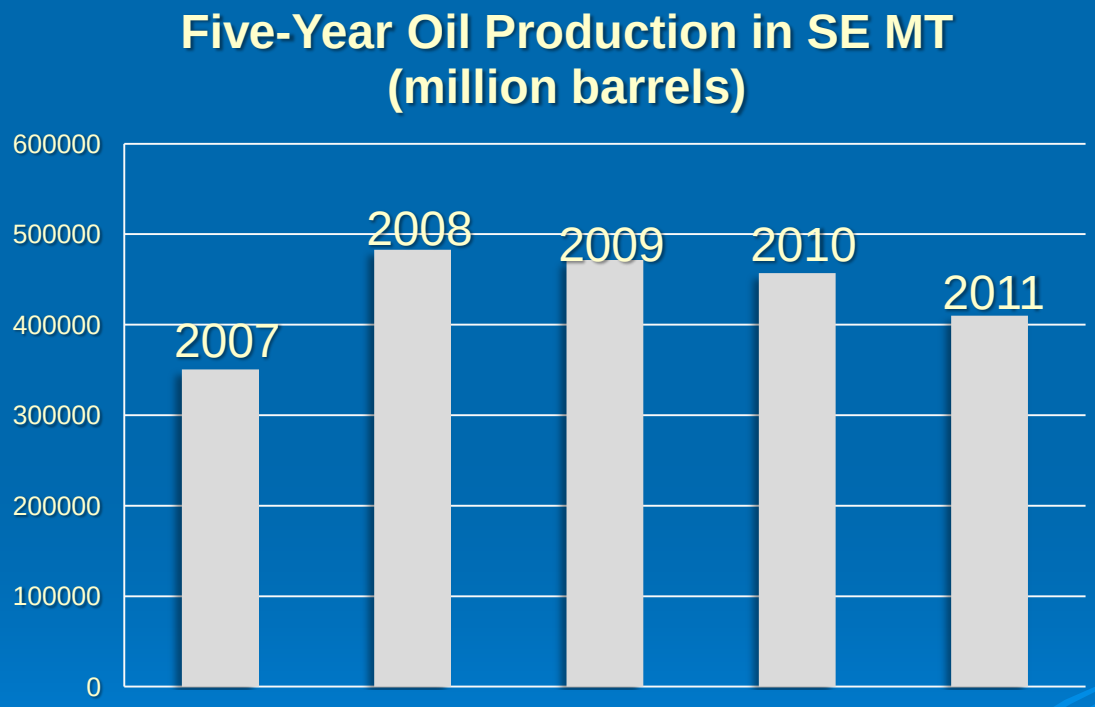
Future Demand: Petroleum Production?



Source: DNRC 2012 Annual Report

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Future Demand: Petroleum Production?

Hydraulic Fracturing Questions*:

- What are the impacts of water acquisition on water quantity and quality? (Water Rights and Water Marketing Issues)
- What are the impacts of fracking fluids on water quality? (Depends on proximity to aquifers that are used by the ecosystem)
- What problems might arise with flowback and produced waters?
- How are returned waters managed and disposed of on the surface?
- What are the socio-economic issues and how should they be addressed?

*Montana Water Newletter, Feb. 28, 2013

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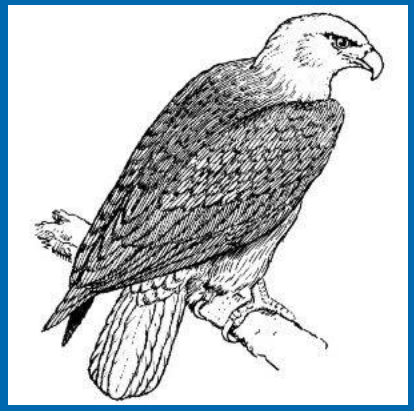
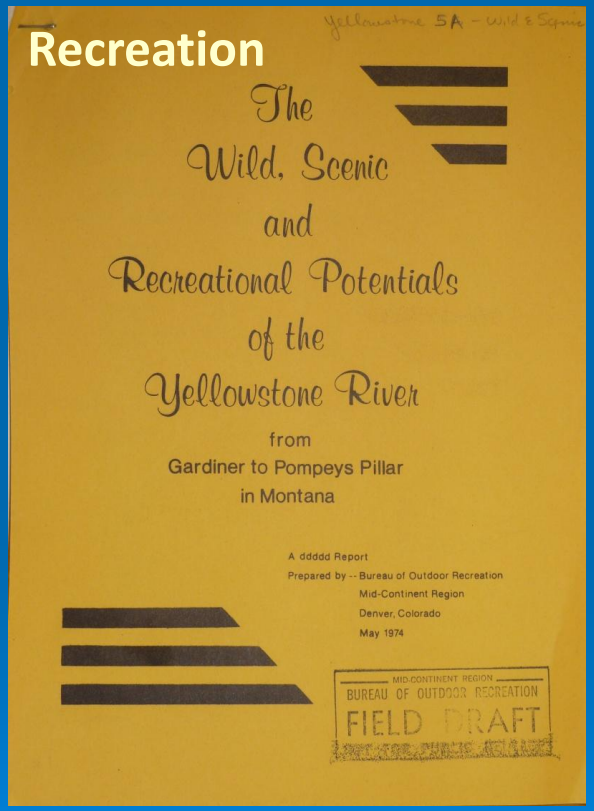
Yellowstone River Basin

Future Demands: Instream Uses

Habitat



Recreation



Cultural Heritage

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