GREENFIELDS IRRIGATION DISTRICT

MANAGING DROUGHT IMPACTS CURRENT & FUTURE

GREENFIELDS IRRIGATION DISTRICT

Who we are – Background

- District comprising +132,760 acres, 207 sq. miles
- Cascade, Teton and Lewis & Clark Counties
- Part of the USBR's Sun River Project along with Fort Shaw Irrigation District
- GID is quasi government organized under State law, Title 85, Chapter 7
- Head-quartered in Fairfield
- There are over 1550 individual farm units parcels
- 550 individual landowners and 450 producers

GREENFIELDS IRRIGATION DISTRICT

Where we came from – History

- Irrigation on the Sun River began back in the 1880's related to the military installation at Fort Shaw
- Sun River Project was authorized by the Reclamation Service in 1905
- First official water delivery to Ft Shaw ID in 1909
- First water delivery to Greenfields ID in 1920
- Greenfields Irrigation District was formed in 1925

GREENFIELDS IRRIGATION DISTRICT

What we do – Operations

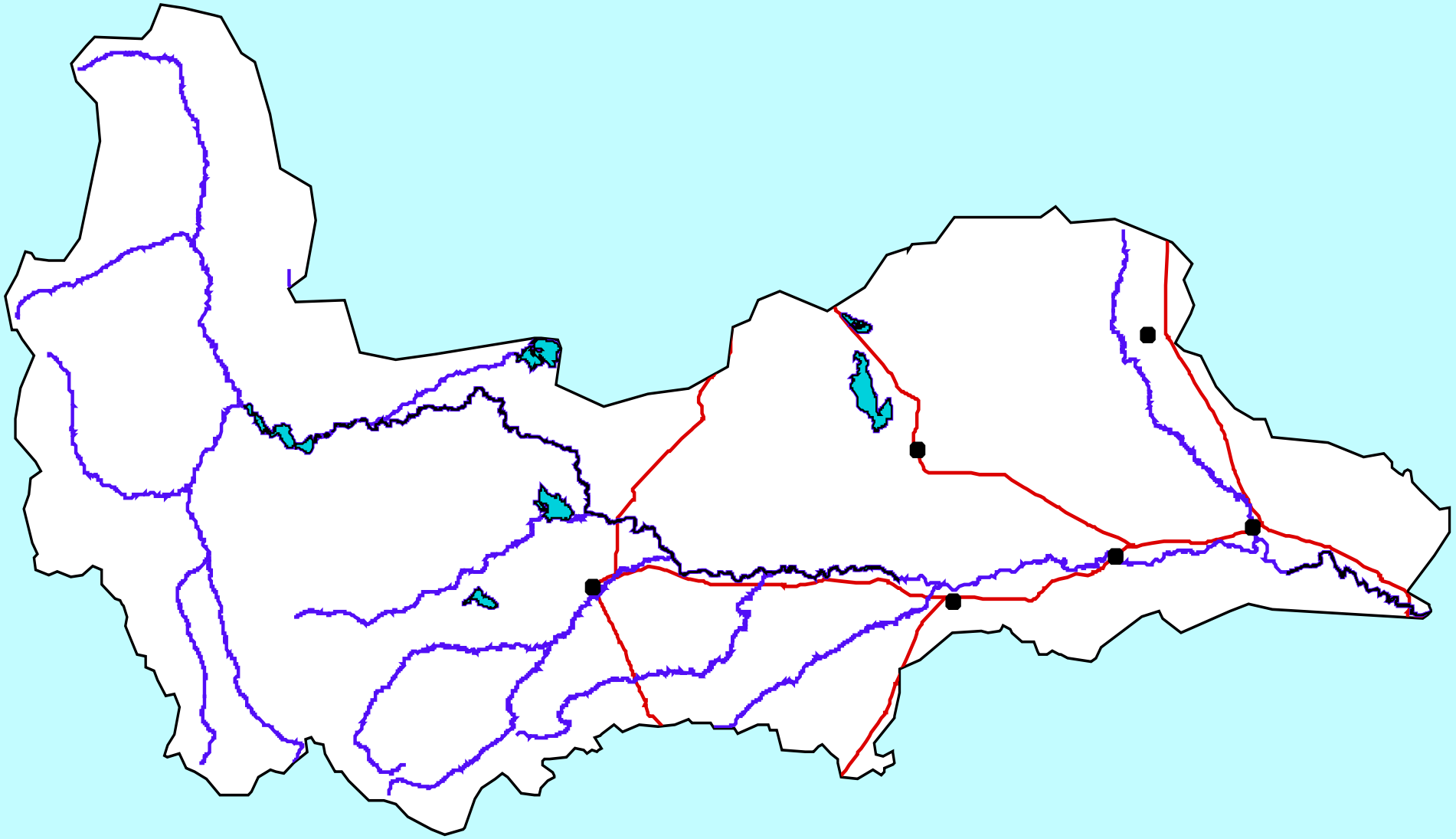
- Deliver irrigation water between April 1st and Oct 31st
- Water Rights allow for 83,231.72 acres of irrigation
- Administer over 24,000 acres of Grazing Land
- O&M rates are assessed through county taxes
- Currently $33/acre, relatively cheap expense
- A staff of 18 FTEs
- 4-6 additional seasonal workers
- Full compliment of heavy equipment
- Pre-cast concrete facilities

GREENFIELDS IRRIGATION DISTRICT

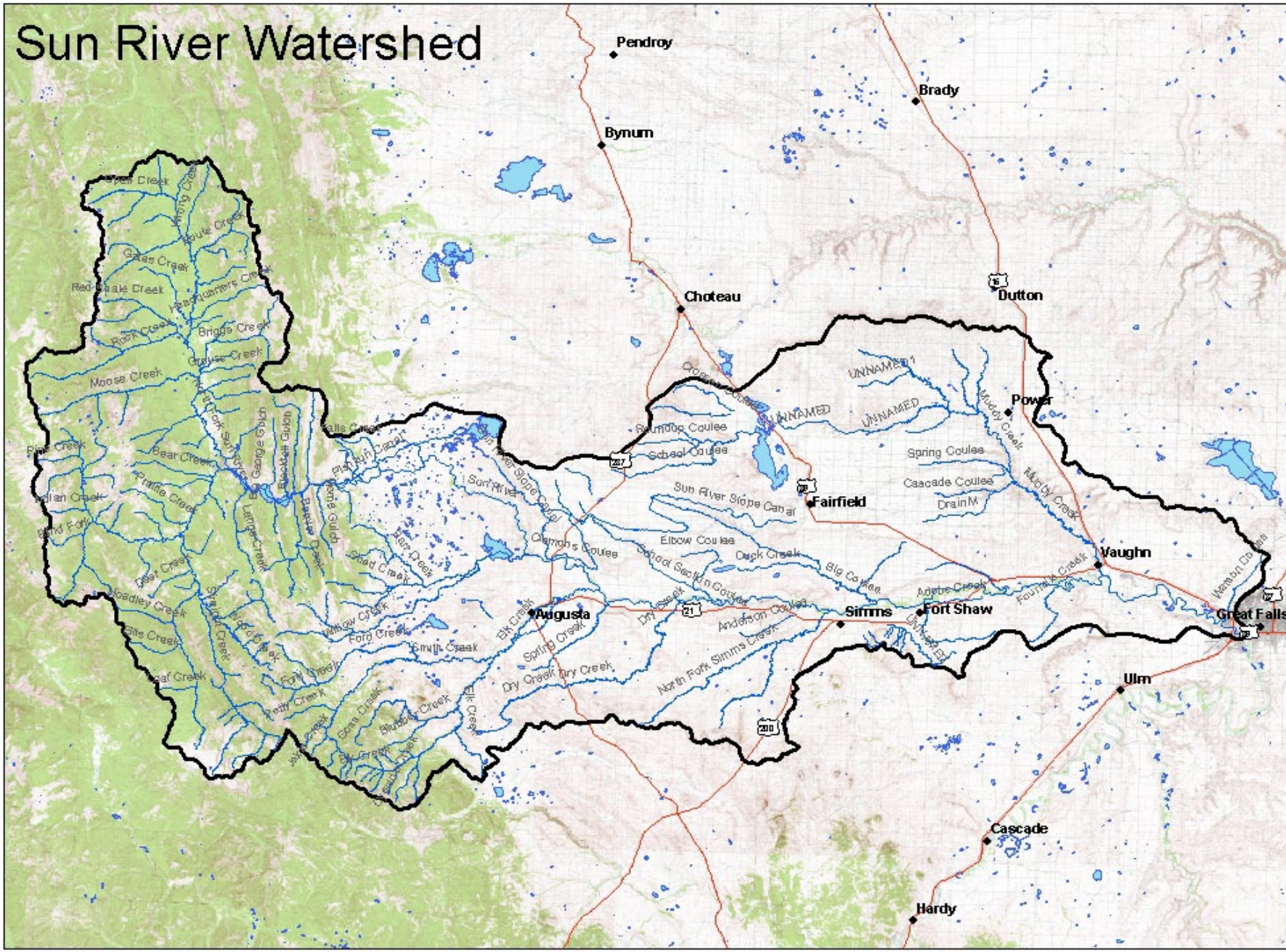
What we do – Maintenance

- Responsible for operation and maintenance of infrastructure including
  - Gibson Dam & Reservoir
  - Willow Creek Dam & Reservoir
  - Pishkun Dikes & Reservoir
  - Diversion Dam
  - Major structures such as bridges, tunnels, siphons, canal headworks, drops, check structures & etc.
  - Over 50 miles of major supply canals
  - Over 400 of miles of submains, laterals, & drains

Sun River Watershed



1.4 million acres


Sun River Watershed
Pendroy
Brady
Bynum
Choteau
Dutton
Power
Fairfield
Vaughn
Augusta
Simms
Fort Shaw
Great Falls
Ulm
Cascade
Hardy
Sun River
Sun River Slope Canal
Elbow Coulee
Duck Creek
Big Coulee
Muddy Creek
Spring Coulee
Cascade Coulee
Drain M
Dry Creek
Spring Creek
Elk Creek
Ford Creek
Willow Creek
Shed Creek
Deer Creek
Bear Creek
Moose Creek
Briggs Creek
Gruiser Creek
Gates Creek
Red Shale Creek
Rock Creek
Pine Creek
Indian Creek
Beaver Creek
Prairie Creek
Blacktail Gulch
George Gulch
Larger Creek
Smith Creek
Bluebird Creek
Falls Creek
Pretty Creek
Gans Creek
Big Creek
Sheep Creek
Loadley Creek
Gilts Creek
Calf Creek
Dry Creek
Dry Creek
Anderson Coulee
North Fork Simms Creek
Fourmile Creek
Muddy Creek
Marias River
UNNAMED
UNNAMED
UNNAMED
Schmidts Coulee
School Coulee
Chamon's Coulee
Sand Coulee
Sand Creek
Sand Creek
Sand Creek

GREENFIELDS IRRIGATION DISTRICT

Operational Limitations

- Our size mandates that we operate off storage
- Irrigation releases from Pishkun Reservoir can exceed 1,700 cfs
- Annual water deliveries exceed 250,000 acre-feet
- Useable storages
  - Gibson Reservoir – 93,300 ac-ft
  - Pishkun Reservoir – 10,000 ac-ft
  - Willow Creek Reservoir – 20,000 ac-ft
- GID's Irrigation Season is Done when our storage is depleted
- GID was designed & built to support water use & water supply conditions that existed over 100 years ago

Pishkun Reservoir
© 2015 Google
Google eart

GREENFIELDS IRRIGATION DISTRICT

Operational Impacts

- Our current delivery efficiency ranges from 50% to 65%
- GID infrastructure was designed and built to support flood irrigation. We now have 75% sprinklers.
- Our inherent inefficiencies result in waste flows leaving the District via small drainages.
- Because GID is an off-stream irrigation district, waste flows can create environmental issues such as erosion and deposition.

GREENFIELDS IRRIGATION DISTRICT

Where We Need Go – Drought Resiliency

- If we were designing and building GID infrastructure today, it would look completely different.
- In general, GID's critical infrastructure is beyond its design life and susceptible to a mid-season, catastrophic failure.
- Problems do not fix themselves and they do improve with time. Look at issues to the north.
- GID needs to be aggressive and vigilant in its efforts to replace aging infrastructure, modernize operations, improve water management practices, and reduce environmental impacts

GREENFIELDS IRRIGATION DISTRICT

How We Get There – Strategy

- Creating a closed system rather than an open, gravity system.
- Developing re-regulation ponds within the distribution portion of our system.
- Creating in-canal checked storage.
- Designing distributive pumping and pipeline deliveries.
- Maximizing automation & remote-control capabilities.
- Embrace downstream demand philosophy rather than upstream supply approach

GREENFIELDS IRRIGATION DISTRICT

Managing Drought Impacts

- Currently – reduce irrigation allotment from 24 inches to 12 inches. Forces producers to be vigilant with their water. Not much else can be done but ride out the storm and hope for the best.
- Future Impacts –
  - Improve our water use efficiency. A 15% increase in efficiency results in an additional 37,500 ac-ft which equates to an extra 20 days of irrigation.
  - Replace aging infrastructure with modern versions
  - A complete overhaul of GID water delivery operations to match today's usage trends.
  - Develop more off-stream storage where Spring run-off can be stored

QUESTIONS????