Arctic Grayling Recovery Workgroup
Annual Meeting
February 28, 2006

Location: Bozeman at MFWP Headquarters
1400 s. 19th Street

Time: 9:00 am – 4:30 pm
Lunch will be served

Agenda:

9:00: Introduction- Bob Snyder (FWP)

9:05 – 9:35: ESA Status update – Doug Petersen (USFWS)

9:35 – 10:05: Big Hole River 2005 Summary – Jim Magee (FWP)

10:05 -10:30: Reintroduction Efforts - Emily Rens (FWP)

BREAK

10:45- 11:00: The Nature Conservancy: Big Hole Conservation Efforts - Tim Swanson

11:00 – 11:30: CCAA Content and Status – Peter Lamothe (FWP)

11:30-11:45: Arctic Grayling Recovery Program Web Site – Peter Lamothe/ Adam Peterson (FWP)

11:45-12:00: Funding and Staffing Needs: Bob Snyder: (FWP)

12:00 – 12:30: Lunch

12:30 – 12: 45: CCAA Rapid Assessment Surveys – Adam Petersen (FWP)

12:45-1:05: Gibbon River Grayling Research Project/ Yellowstone National Park Update - Amber Steed ((MSU masters student)

1:05 – 1:20: USFWS Partners for Fish and Wildlife Program Big Hole River CCAA Efforts – Jeff Everett (PFWP)

1:20 – 1:40: Big Hole River Hydrology and CCAA Efforts – Mike Roberts (DNRC)

1:40 – 2:00: Trout Unlimited - Alternatives for Improving Instream Flows in the Big Hole (Stan Bradshaw, Laura Zeimer, Bruce Farling)

2:00 – 2:10: BREAK

2:10 – 2:40: NRCS Update - Dave White and Tim Griffiths (NRCS)

2:40-2:50: Lacustrine Grayling Conservation efforts Dick Oswald (FWP)

2:50 – 3:00: Brood Stock Update - Jay Pravecek (FWP)

3:00 – 3:10: Madison/Ennis Conservation Efforts: Pat Clancey (FWP)

3:10 – 3:20: Arctic Grayling Recovery Program Update: Buddy Drake

3:20 - 3:35: Restoration Plan/Technical Workgroup: Snyder/Magee (FWP)

3:35 – 3: 50 Genetics Proposal --Doug Petersen (USFWS)

3:50 – 4:00 Red Rocks Grayling: Glenn Boltz/ Lynn Kaeding (USFWS)

4:00 – 4:10: Work Plans 2006

4:10 - 4:30 OTHER UPDATES

Schedule next year's meeting (Feb. 27th?)

END

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Annual Meeting
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MEETING NOTES

ESA update - Doug Peterson (USFWS)
The Big Hole fluvial grayling are a Candidate species. In 1994, the US FWS determined Big Hole fluvial Arctic grayling were "warranted but precluded".

In 2002, the Center for Biological Diversity filed a lawsuit over the warranted but precluded determination. The lawsuit was settled in August 2005. As part of this settlement FWS agreed to make a final listing determination by April 16, 2007. Possible outcome: Negative 12-month finding or a proposed rule to list. Proposed rule could be out by April-June 2006. Plaintiffs received $110,000 in the settlement for attorney's fees.

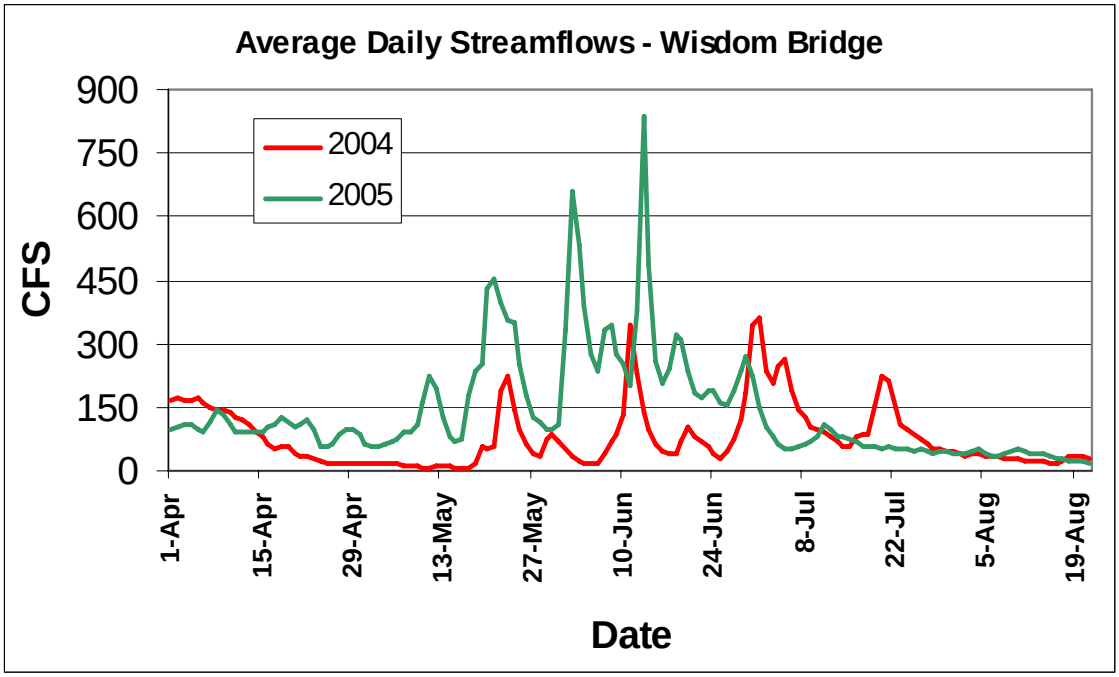
No CCAA has been challenged in court, but HCPs have.

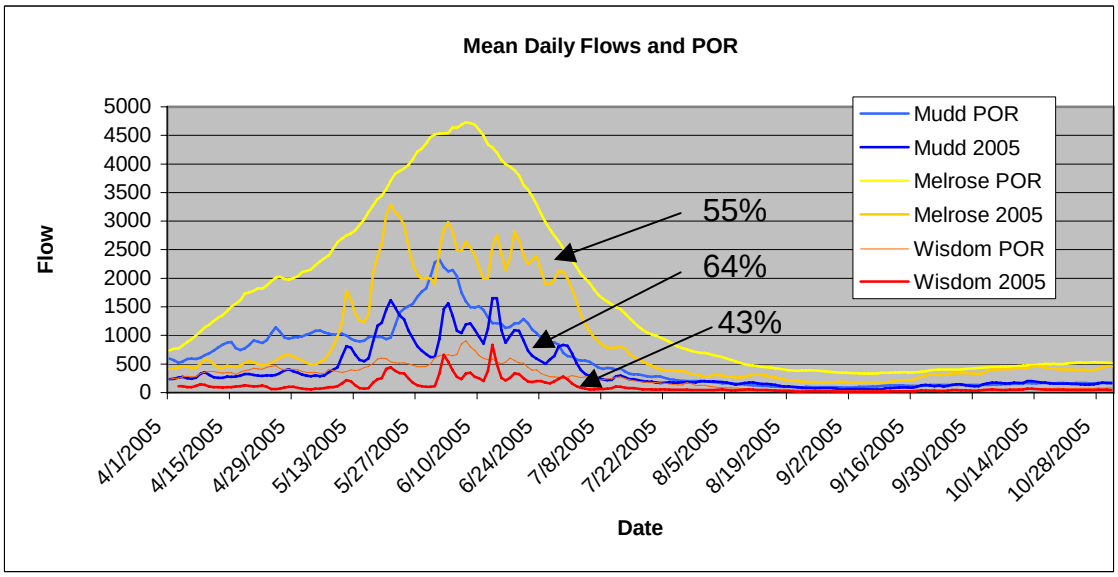
DPS issue. A DPS has two criteria: Discreteness (markedly separated by physical, physiological, ecological or behavioral factors and international borders; and Significance (ecological setting, loss of DPS would create significant gap in range, species' only surviving natural occurrence). Upper Missouri grayling seem to meet the criteria of a DPS. Initial petition was for fluvial life history. Determining the DPS designation is part of the listing decision. The Secretary of Interior is ultimately responsible for making the final decision.

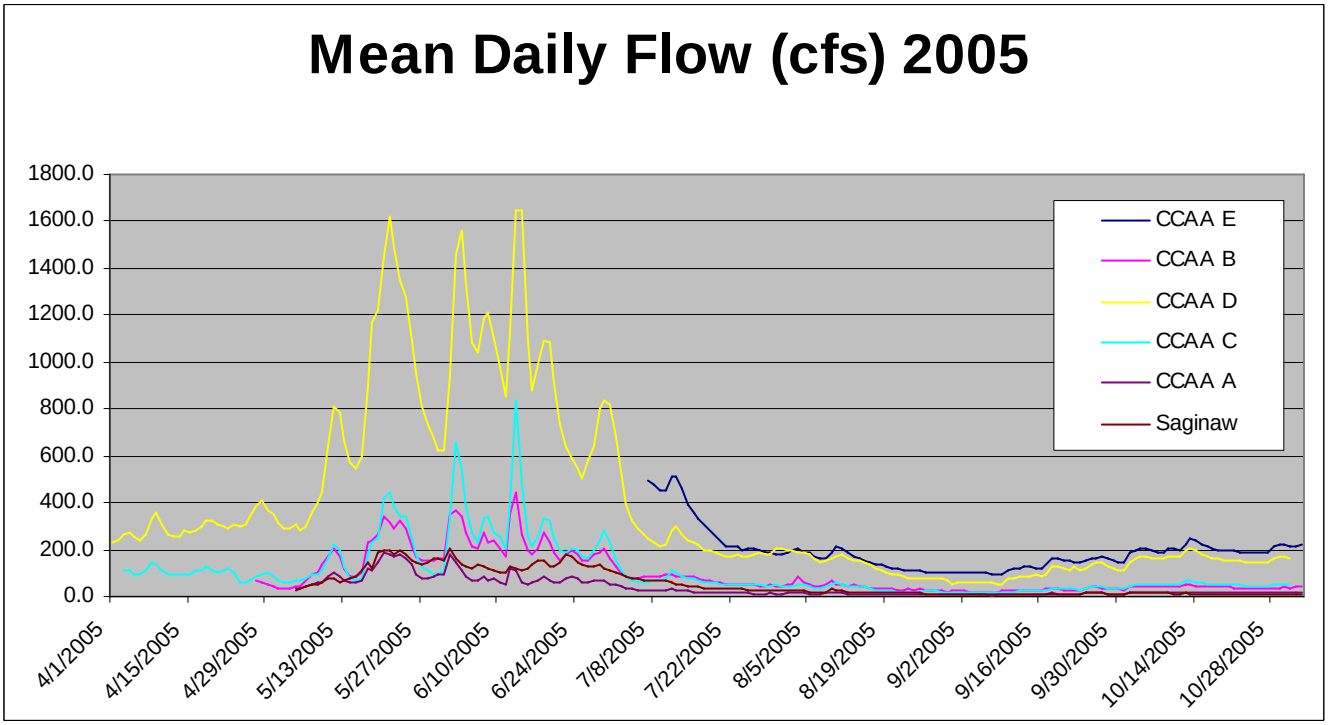
Big Hole River 2005 Summary - Jim Magee (MT FWP)
Grayling habitat restoration must be comprehensive. It must incorporate resources from all participating groups and must address environmental parameters-not just flows.

Flows & temperature
There are 3 USGS gages: Melrose, Mud Creek and Wisdom and 8 aquarods have been installed in the upper Big Hole.

In 2005 we were still in a drought. Headwaters had lower temps than middle reaches. The lower reach has cooler springs and tribs, so Management Segments C and D have the worse temperature profiles. Tributaries provide important thermal refugia.


Average Daily Streamflows - Wisdom Bridge
CFS
900
750
600
450
300
150
0
2004
2005
1-Apr
15-Apr
29-Apr
13-May
27-May
10-Jun
24-Jun
8-Jul
22-Jul
5-Aug
19-Aug
Date


Mean Daily Flows and POR
Flow
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
Mudd POR
Mudd 2005
Melrose POR
Melrose 2005
Wisdom POR
Wisdom 2005
55%
64%
43%
4/1/2005
4/15/2005
4/29/2005
5/13/2005
5/27/2005
6/10/2005
6/24/2005
7/8/2005
7/22/2005
8/5/2005
8/19/2005
9/2/2005
9/16/2005
9/30/2005
10/14/2005
10/28/2005
Date


Mean Daily Flow (cfs) 2005
1800.0
1600.0
1400.0
1200.0
1000.0
800.0
600.0
400.0
200.0
0.0
CCAA E
CCAA B
CCAA D
CCAA C
CCAA A
Saginaw
4/1/2005
4/15/2005
4/29/2005
5/13/2005
5/27/2005
6/10/2005
6/24/2005
7/8/2005
7/22/2005
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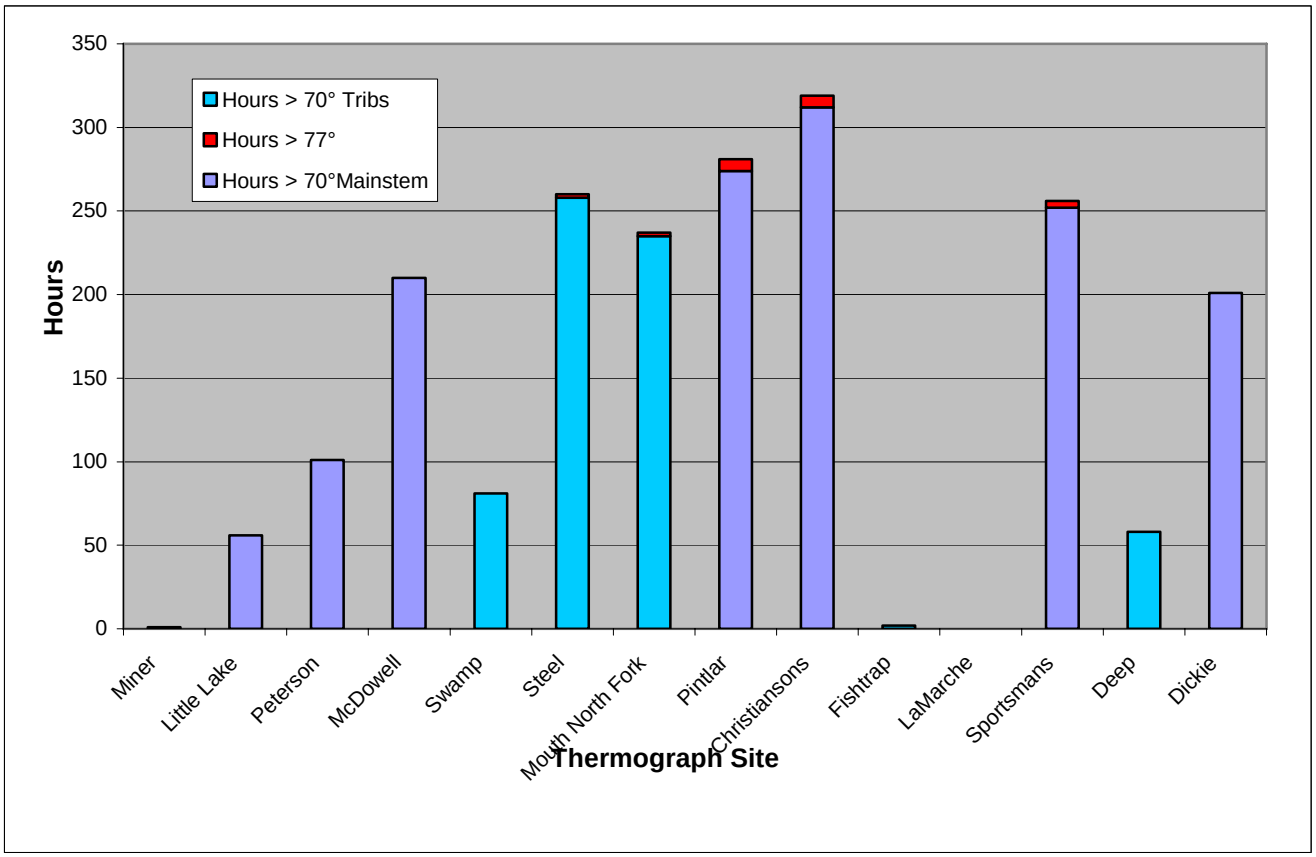
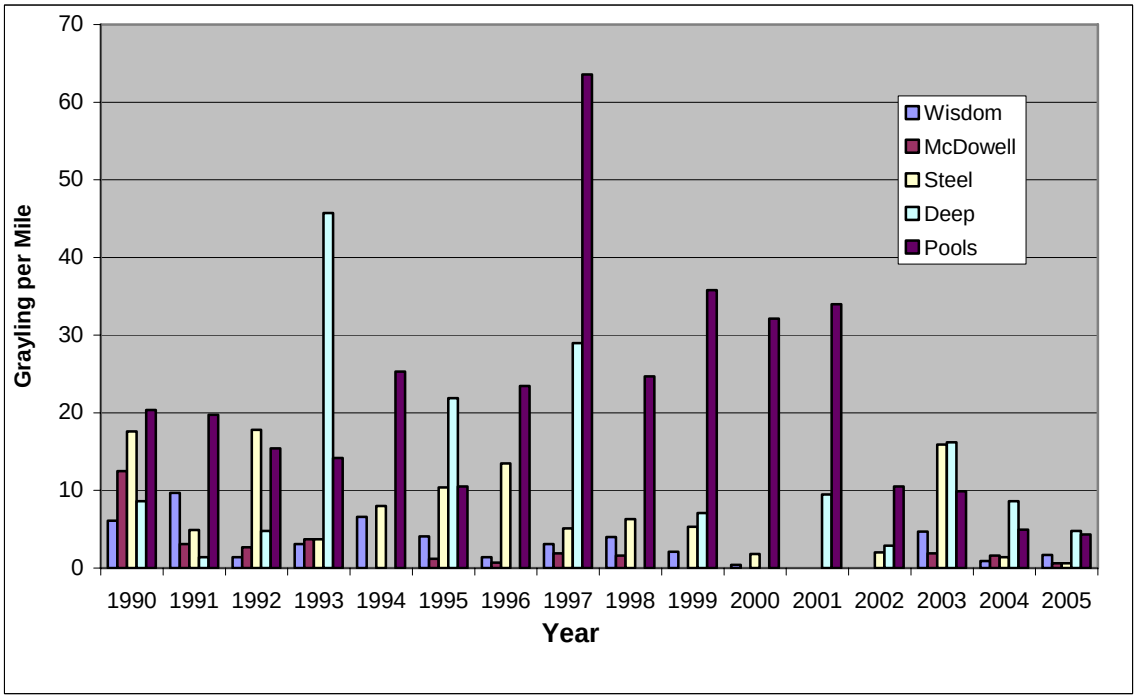
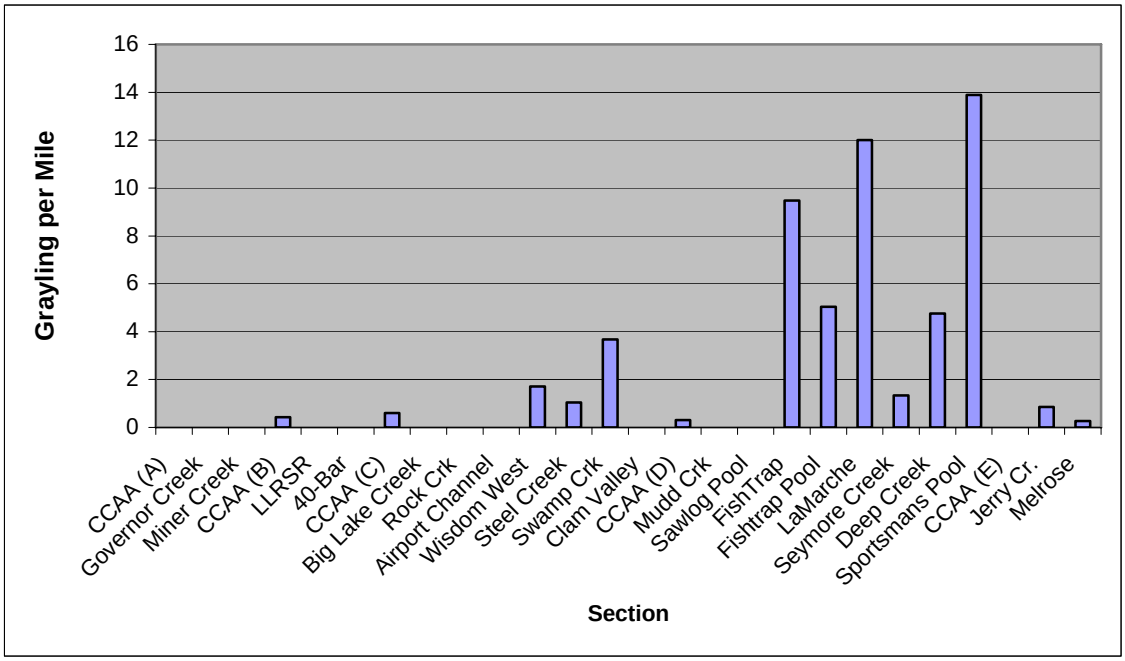
10/14/2005
10/28/2005

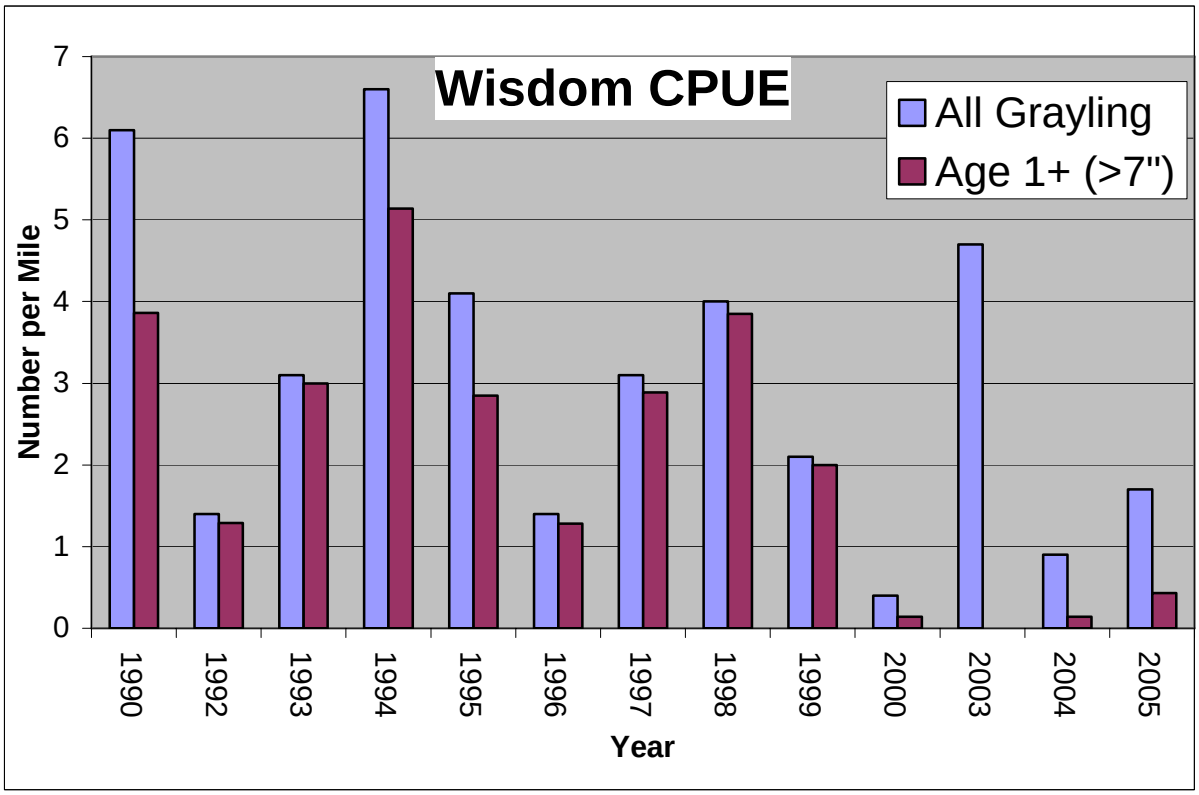

350
300
250
200
150
100
50
0
Hours
Hours > 70° Tribs
Hours > 77°
Hours > 70°Mainstem
Miner
Little Lake
Peterson
McDowell
Swamp
Steel
Mouth North Fork
Pintlar
Christiansons
Fishtrap
LaMarche
Sportsmans
Deep
Dickie
Thermograph Site

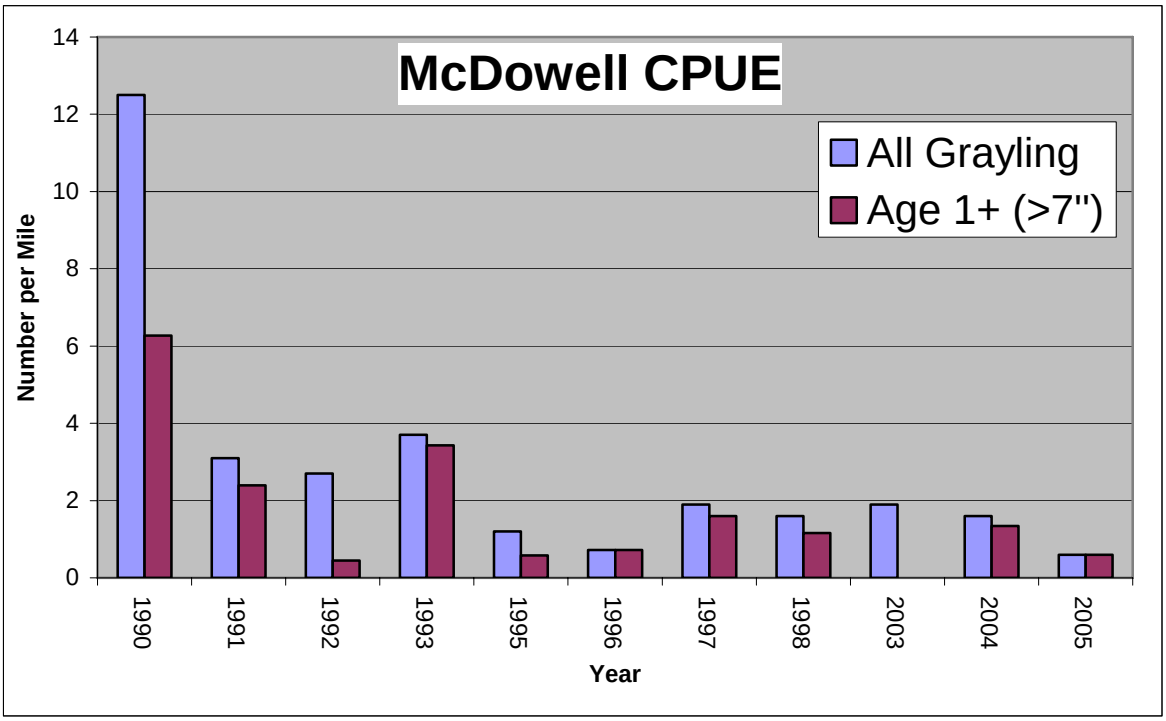
Monitoring
Monitoring in 2005 used CPUE. This will provide a baseline for monitoring in 10 new CCAA sections and historic reaches. A total of 56 miles were shocked.

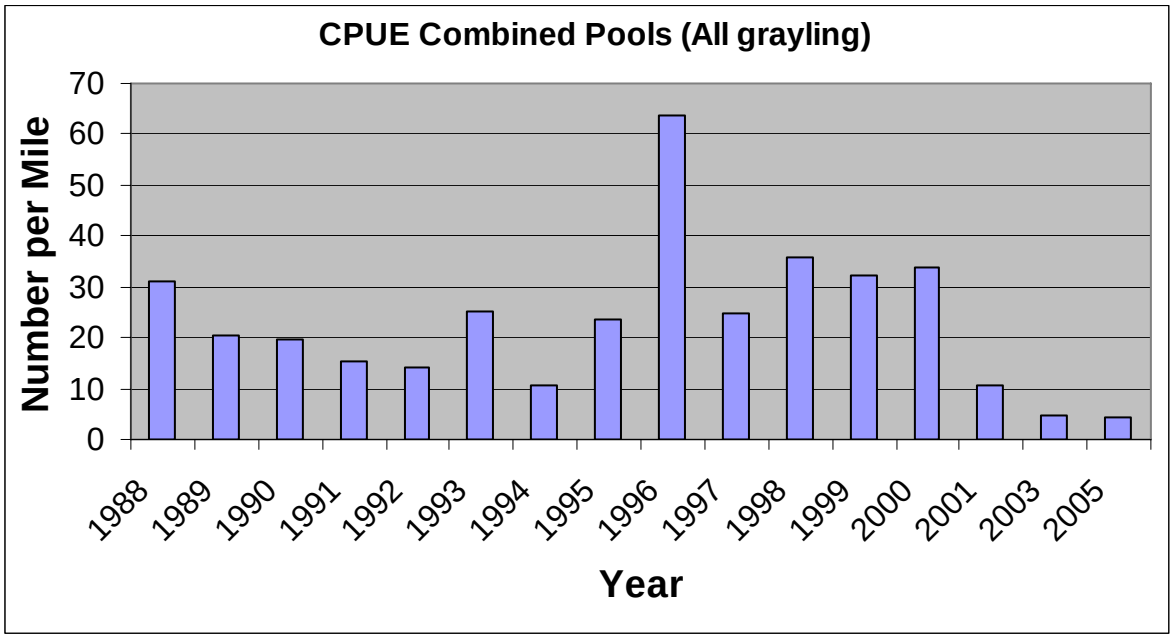
Population trend data in the standardized monitoring sections currently display a downward trend, but the hope is this year's adults will reverse this trend. There is a stronger adult age class expected to spawn this year, so the potential is for a good recruitment year.






Wisdom CPUE
All Grayling
Age 1+ (>7")
Number per Mile
0
1
2
3
4
5
6
7
1990
1992
1993
1994
1995
1996
1997
1998
1999
2000
2003
2004
2005
Year


McDowell CPUE
All Grayling
Age 1+ (>7")
Number per Mile
0
2
4
6
8
10
12
14
1990
1991
1992
1993
1995
1996
1997
1998
2003
2004
2005
Year



Habitat
Habitat in Management Segments A and B is generally good. Management Segments C and D are worse, while Management Segment E has big pools.

Habitat monitoring includes measurement of habitat, mean daily flows, and water temperatures.

A list of habitat projects was presented, along with list of contributing partners. $107,900 was spent on conservation projects in 2005. These included one channel morphology improvement project, two riparian fencing projects, 6 projects to improve irrigation efficiencies, beaver dam notching projects on three streams to improve fish passage, one off-stream stock water project, two bank stabilization projects, and the installation of four fish ladders.

The fish ladders have passed species other than grayling, therefore grayling are expected to pass if present. The LaMarche Creek project installed a stockwatering well, riparian fencing, and enhanced the number of pools. Sixteen pools were constructed. Prior to construction the single pool in this stream reach had grayling in it, now there are 16 such pools.

Another big project was the reconnection of Rock Creek to the Big Hole, rather than having it running into ditch.

Water Agreements - Laura Zeimer (MT Water Project TU)
The complexities of converting water rights were demonstrated using Poorman Creek in Upper Big Hole. You can't make more water. Beneficial use is part of the definition of a water right. Conversion of flood to sprinkler systems often increases total water use, but you're trading early season flows for increased late season flows. Lower conveyance

losses by moving water through a pipe rather than a ditch yields increase in irrigation efficiencies and thus water savings.

When estimating water savings through conservation, one needs to understand the irrigation system operation and the basin hydrology. Strive for irrigation efficiency, but not always equal to water savings. Flood to sprinkler conversion can equate into short-term gains in surface water during early irrigation season and depletion during late season.

Water right changes requires proof of historic use and proof that change in water right will not have adverse effect by changing timing of flows.

Formal short-term agreements can be effective and may serve well until a long-term arrangement with a water right change can be arranged. "Real water agreements take forever."

Big Hole Conservation Efforts - Tim Swanson (TNC)

Tim has been with TNC since 1998 and is the SW MT Project Manager with a focus on the Centennial Valley. TNC has an easement on Arrow Ranch and Dooling Ranch in Big Hole. TNC is excited about size of CCAA project and wants to raise money to assist with the project. TNC Stewardship Program starts with easement documentation that establishes limitations on what landowners can do (no subdivision, no mining, etc.). It is important not to be to heavy handed on restrictions. As relationship with landowner develops, more restrictions can be negotiated. If conditions warrant, TNC will step in and ask for more restrictions.

CCAA, AGRP and Beyond - Peter Lamothe (MT FWP)

There is a lot of government agency-owned land in the Big Hole, so ESA-listing will have impacts on land management agencies in the Big Hole and Ruby. Forty private landowners have enrolled 235-250,000 non-federal acres, including state lands.

Precipitation, land management, water use, status of irrigation structures, and landowner cooperation affect stream flows. In 2004 landowners irrigated early because of concerns about water availability. NRCS EQIP made the best of a bad situation. Some landowners benefited. No long-term solutions were worked on. In 2005 higher spring flows were achieved, primarily due to increased cooperation from irrigators. High flows did not correlate with an increased grayling population. The ultimate measure of success to increased flows will be a response by grayling. While we still had low late summer and fall flows, Pete expects that can be improved on too. The desired hydrograph is dynamic and includes high and low flows, including channel-maintenance flows in spring. CCAA can improve flows through increased participation in conservation measures and by addressing poor irrigation infrastructure and grazing/irrigation

management. CCAA has no control over drought or un-enrolled landowners. We need resources, mainly money, to pull off the CCAA.

The availability of resources will affect the timeline of completing CCAA conservation measures. There are staffing issues. The upper Big Hole needs a lot of help! AGRP needs to be the leader of the implementation of conservation measures. There is also a need to disseminate information. The opportunities that currently exist will never become available again. Our current resources are spread thin. AGRP must be proactive and actively seek out financial support. We need good communication and need to ask questions with a sense of responsibility. Must share credit for successes and failures.

There is a new AGRP website: Graylingrecovery.org. The focus is on getting information out, both good and bad. The message is: we need helpto recover the big hole grayling!

Rapid Assessment Surveys - Adam Petersen (MT FWP)
Rapid Assessment Surveys initially looked for immediate threats, but also mapped the watershed. Surveys were performed in late May through August. Thirty-nine different ranches totaling approximately 230,000 acres were surveyed. Surveyors looked for barriers, habitat degradation, the status of irrigation structures, livestock confinement areas and any other problems. RASs did not find any acute immediate threats to grayling. Most barriers were stream-wide irrigation diversions (54 likely, 81 not likely, 58 possible). Most culverts were not barriers, but 4 were. Of the beaver dams surveyed, 89 were likely barriers, 17 were not likely, and 6 were possible barriers. A significant amount of habitat is not available to upstream movement by grayling.

Habitat is very poor throughout mainstem Big Hole River and tributaries. While most headgates functioned adequately, 31 could be improved. Ten on-stream livestock confinement areas were identified.

Surveys on state leased lands and one new landowner are scheduled for 2006.

Amber Steed- MSU masters student
The NPS' Gibbon River Project will determine if fluvial grayling exist in Gibbon River. There were probably no fish above Gibbon Falls historically. This project will use microsatellites to measure genetic differences between lake and river grayling.

Jeff Everett – FWS Partners Program
In 2005 Jeff assisted with development of site-specific plans and assisted Mike Roberts measure flows and install measuring devices. Project development included permitting, bidding and contracting, and obtaining funding.

Carol Endicott – Confluence – TMDL for Big Hole River
TMDL plans must restore water quality. Plans include quantified numeric targets. TMDLs complement the CCAA by focusing on water quality issues and can provide additional funding through EPA. The TMDL reach in the Big Hole is from the

headwaters to the confluence with Pintlar Creek. The current draft TMDL for the Big Hole uses the environmental criteria for bull trout as a surrogate for what grayling need. A lot of the targets and target measurement protocols have not been finalized.

Mike Roberts – DNRC - The hydrologic realities in the BHR.
There are 130,000 acres of primarily flood-irrigated lands in the upper Big Hole. Wisdom Bridge is the most dewatered section of BHR and is the only long-term gaging record in upper basin. Over-irrigation and 2400 acres of sedge are issues, as are leaky headgates and pasture irrigation across sagebrush flats and on highly-permeable soils.

DNRC's role in the CCAA process: Provide technical support, water rights compliance water measurement, hydrology, training and education to partnering agencies and landowners, and irrigation structure inspection and installation. DNRC installed 12 continuously recording flow stations in Big Hole.

Data collection: Mike is investigating (quantifying) return flows and their impacts on streamflows. Precipitation and snowpack was less in 2005 than in 2004, but 40% more volume of water passed Wisdom gage. There are some data that show that saving water (reducing withdrawals) yields more water to the river.

Emma Rens – Reintroductions in Ruby, Sun and upper Missouri.
Ruby River: Spring sampling in April 2005 consisted of sampling in 5 reaches. The highest abundance of grayling was in Vigilante section. Some over-winter YOY grayling were found, but don't know if they were from RSIs or natural reproduction. More grayling were captured in 2005 than in 2004.

Brood ponds: Grayling in brood ponds were sampled for disease. No pathogens were detected. Green Hollow grayling are 5 and 6 years old. Axolotl grayling are 5, 7, and 8 years old. An increase in fecundity was measured in the Axolotl population in 2005. This is probably due to having older-aged fish and increased average size due to the reduced pond population.

Twenty-two RSIs were placed in the Ruby in 2 different time periods. More fry were captured in the Ruby in the 2005 fall surveys than in previous years. Additionally, over-winter survival has been documented. Grayling from RSIs are now 2-5.6 inches in length. Movement of grayling into Ruby Reservoir has been limited, especially since stocking efforts have focused on more upstream sites.

Twenty-five RSIs were placed in the Sun. 10,000 fry were produced in 2004, and 35,000 in 2005. Natural reproduction and recruitment (progeny) were documented from stocked fish.

The table below shows total numbers of grayling stocked in the four recovery reaches (YOY= Young of the year; Y= yearlings; 2 = Age 2 fish). Over-winter mortality for both yearlings and YOYs is estimated at 90%. There are no self-sustaining populations established yet, but natural reproduction has been documented.

Stocking Efforts

Arctic Grayling Restoration
Plants 1997- 2005

SITE	YEARS	# PLANTED	TOTAL
Ruby	97-05	YOY: 30,000 Y: 106,600 2: 650	137,250
N&SF Sun	99-01	Y: 35,000	35,000
Beaverhead	99-02	YOY: 5,065 Y: 78,000	83,065
Missouri HW	00-05	YOY: 123,600 Y: 139,500	263,100
TOTAL	97-05	YOY:65,565 Y: 206,000 2: 650	518,400

Habitat projects in Willow Creek were completed. Projects included putting creek back in historic channel, increasing channel length and removing a feedlot. Habitat projects were initiated on Ruby River and Lazyman Creek (a Ruby trib) to stabilize river pools, create tributary spawning channel and increase riparian health.

Plans for 2006 are to increase the number of RSIs used in the Ruby by 10 and NF Sun by an additional 5. The Ruby will not be stocked in 2006 in order to measure the effects and effectiveness of past reintroductions.

Dave White and Tim Griffiths – NRCS
2004 accomplishments: EQIP Special Initiative #1 negotiated agreements with 16 landowners to curtail early irrigation on 15,848 acres and developed 12 off-stream stockwater sites. Three additional facilities contracted in 2004 will be installed in 2006. These contracts total $774,000.

2005 accomplishments: Grayling entrainment surveys were contracted and performed on 59 miles of ditches ($25,000). EQIP Special Initiative #2 contracted with 17 landowners to replace 65 headgates, provide 51 diversions with fish passage including the installation of 7 fish ladders, install 52 water measuring devices, and 1 off-site water development. Total disbursement will be $561,737. Two fish ladders, 1 diversion, and a minimum of 64 structures will be installed in 2006. All 108 structures contracted under 2005 will be installed by 2007. A Conservation Partnership with the BHR Foundation was funded ($134,988). Cooperative agreements with DNRC ($99,214) and FWP ($57,106) were established to increase staffing levels for grayling recovery and implementation of the CCAA. Helped financed water rights and water management database ($10,000). Let contract for development of 7 site-specific grazing management plans ($163,303).

Increased local NRCS staff (2 range cons, 1 soil con, 1 student intern, 1 volunteer)($125,000).

For 2006, EQIP Special Initiative #3 has $250,000 available for projects. Nine applications for projects have been submitted so far. Approximately $200,000 will be available in 2006 for technical assistance VIA Technical Service Providers. NRCS anticipates completion of 7 grazing management plans totaling 76,600 acres in spring of 2006, another 4 plans in summer, and another 4 plans in fall. By fall, grazing management plans will be completed for 118,900 acres.

NRCS has spent $2.4 million for grayling recovery in the Big Hole basin since 2004.

Technical Service Providers (TSP) program increases the number of certified contractors to design and install structures.

Two grazing workshops are scheduled for March 14 (Divide) and March 15 (Jackson Hot Springs).

Dick Oswald – Lacustrine grayling in the Centennial Valley and Red Rock Lake

All progeny from the 2005 egg take went into Rogers Lake. Red Meadow Lake puts out eggs late in summer. There was 25% eye-up from eggs from Rogers. 90% or better eye-up from eggs from Red Rocks.

Grayling have not appeared in Elk Lake sampling since late 80s.

Non-native fish technical committee-
As partial fulfillment of an FWP commitment within the CCAA, a non-native fish technical committee was established within the Workgroup to review the effects of non-native fish on the recovery of grayling. This committee will advise the Workgroup on the need for further actions to address non-native interactions with grayling. The committee will be composed of Jim Magee (FWP Grayling Recovery Biologist), Bruce Rich (FWP Fisheries Manager), Dick Oswald (FWP Management Biologist), Bruce Farling (MT TU representative), and Doug Peterson (FWS ES Biologist). The committee needs to determine whether they need a statistician. Group will report to the Workgroup at its annual meeting.

Jay Pravacek - Yellowstone River Trout Hatchery

The hatchery population has been tested and found to disease free.

Bozeman Fish Technology Center - Molly Webb and Kevin Kappenman
Molly and Kevin are working on the remaining broodstock at the Fish technology Center to determine assay techniques for induction of spawning. After the tests are completed, the fish will be euthenized.

Pat Clancey – Madison River grayling

Work on the Madison River grayling began with Pat Byorth. The population acts like an adfluvial population: running from reservoir to spawn in the river and then returning to the reservoir. Pat spent 21 shocking days in 2004 and found 19 grayling. High fish movement and braided channel make sampling difficult. This year (2006), Pat and Joel will work together to find grayling in the Madison and will use a screw trap to look at juvenile return to reservoir. The Madison is genetically similar to Big Hole River.

Buddy Drake – AGRW
Need to have sufficient funding to demonstrate a commitment to the recovery of grayling. Encouraged Workgroup members to maintain or increase funding for grayling recovery.

Doug Peterson – Range-wide genetics survey proposal
Doug proposed an investigation into the range-wide population genetic structure of Montanan grayling. The survey wouldcollect DNA samples from known or putative spawning locations in the big Hole River and connected tribs to estimate the magnitude of philopatry. DNA from archived scales could also be used to estimate the effective population size through time. This survey could be used to define conservation units, predict temporal/spatial components in response to habitat restoration (straying rates) and provide a better understanding of population resilience and extinction risk (bottlenecking).

USFWS Abernathy Conservation Genetics lab will process the samples work. Estimated project budget is $30-35,000. Project would be a multi-year study with some results reported as available.

Glenn Botlz - USFWS – Red Rocks NWR grayling
Eight grayling were trapped and transmittered. Some fish returned to Red Rocks Lake. A lone grayling stayed in Odell creek. Grayling fry were observed in Odell Creek in 2005.

Bob Snyder & Jim Magee – Restoration Plan
Updated the Workgroup on current plan to update restoration plan. Plan would define restoration strategies and goals for grayling within the species' historic range in the upper Missouri.

Mike Parker – USFWS
USFWS is developing a Comprehensive Conservation Plan for Red Rock Refuge. The scoping process is starting. Bob Brannon (FWP wildlife) is FWP's representative.

Next year's meeting will be on February 27th.