

**Arctic Grayling Recovery Program Annual Meeting
March 18, 2008 9AM – 5:00PM**

MEETING NOTES

Introductions and welcome: Travis Horton

Session I. Big Hole River Population and CCAA Program Summary

ESA Status update – Doug Petersen (USFWS)

Background on history of listing decisions was given. On April 24, 2007, the USFWS determined that listing the Big Hole River population of Arctic grayling is not warranted because it does not constitute a Distinct Population Segment (DPS) as defined by the ESA. Prior to this decision, fluvial Arctic grayling in Montana were considered a DPS and classified as a Candidate Species under the ESA since 1994. This decision is currently being litigated. The lawsuit was filed November 2007.

Independent investigations were ordered by the Interior Department Inspector General to review listing decisions made by the former Deputy Assistant Secretary. Of the eight species reviewed by the Service, seven had been returned to Endangered status after the review. Grayling were not one of the eight species reviewed by the Service. Doug commented that there is an apparent paradigm shift in the way decisions are made today when compared to twenty years ago.

Big Hole Projects and Grayling Population Status: Jim Magee (FWP)

Grayling population surveys in 2007 showed a population structure similar to last year. Many young-of-year (YOY) grayling were found in tributaries and the mainstem Big Hole River near Wisdom, and the majority of adults and larger fish were found in the lower watershed in tributaries near Dickie Bridge. The majority of grayling captured (71%) were YOY, and the density of adult fish appeared low.

An increasing abundance and distribution of brown trout in the upper Big Hole is of concern. Changes to the fishing regulations for 2008 address this concern. New regulations for 2008 allow for the harvest of five trout, any size, upstream of Dickie Bridge. Brook trout harvest is also promoted from the headwaters to the North Fork Big Hole River. In this reach, brook trout harvest is open the entire year.

FWP, Partners (USFWS), NRCS, and DNRC and numerous NGOs and funding partners have collaborated on seventeen stream and riparian habitat restoration projects, at a total cost of over one million dollars. These habitat improvement projects will improve conditions for over 156 riparian obligate species, including Arctic grayling. Other projects include approximately 68 miles of riparian fencing, 37 stock water wells for off-stream livestock watering, 15 irrigation improvement projects, nine fish ladder projects, and six confined-animal feeding operation cleanups. Conservation easements are also being pursued in some areas as a way of providing long-term protection to the Big Hole.

A question was asked whether any Flow Agreements were in place for 2008. Peter Lamothe and Mike Roberts addressed this issue in their talk.

A question was asked regarding the reason behind brown trout increases in abundance and distribution. Travis Horton noted that this phenomenon is being documented across Montana and nationally, as well. Could be related to climate change.

Doug Peterson asked whether there was any plan to monitor potential angler effects of brown trout harvest. Changes to the brown trout population will likely be detected through annual CCAA Monitoring efforts. Bruce Rich commented that although the changed angling regulations to promote harvest may have limited effect on the brown trout population, it is a step in the right direction.

CCAA Progress Report 2007: Peter Lamothe (FWP)

CCAA was finalized by the Agencies on August 1, 2006, and landowners were officially enrolled in the program throughout 2006 and 2007. Currently, 32 landowners have enrolled 152,139 acres of private land and 6,030 acres of state land for a total of 158,169 acres of enrolled land. This is currently the biggest CCAA in the country in terms of acres enrolled. It is also the most complex.

The CCAA offers many incentives for landowners, including allowance of Incidental Take, regulatory assurances, non-abandonment protection of water rights, funding, and helpful resource information for their operation. Timelines for progress were addressed. The clock is ticking to complete conservation plans. Progress is being made on grazing plans and habitat restoration projects.

Pete discussed details of several habitat restoration projects. The Wisdom Reach Project features 1.75 miles of the Big Hole River that has been stabilized and revegetated with native willows. The Project reach is fenced and will receive five years of rest from grazing. Numerous agencies (FWP (SWG), USFWS, NRCS), the landowners, and NGOs (BHWC, TNC) collaborated to fund the project.

The Big Hole River – Little Lake Creek Project is a streambank stabilization and revegetation project near the town of Jackson, MT. One mile of River was treated in 2007, and another mile will be treated in 2008. This project includes four miles of fencing and will also receive five years of rest from grazing. Funders included the BHWC, the landowner and FWP (SWG).

The Big Hole River – Jackson Reach Project focused on restoring two stream reaches that were previously used as stream crossings. For this project, the stream channel was restored, streambanks were revegetated, the reach was fenced, and the area will receive five years of rest from grazing. Funders included the BHWC, the landowner and FWP (SWG).

Streamflow improvement efforts were also discussed. Although landowners contributed more water in 2007, maintaining instream flows was challenging due to early runoff, warm temperatures and continued reduced summer precipitation. The Rock Creek Project went dry, highlighting the need for increased communication between Agencies and CCAA enrollees.

Efforts to reduce entrainment were discussed. Seven young of year grayling and one juvenile were captured in a ditch off the North Fork Big Hole River. This dynamic is different than in years prior, when mostly adults/juveniles were captured in this ditch. Two ditches off the North Fork are in the process of being screened.

Progress on fish passage projects was made in 2007. On Rock creek oOne fish ladder was installed in 2007 and another will be completed in 2008. An additional ladder will be installed on Big Lake Creek in 2008. The Governor Creek culvert removal project continues to move forward. At least three diversions were installed using rock weirs rather than pin-and-plank diversions.

Pete discussed analysis of CCAA monitoring data. The approach is to use habitat, streamflow, temperature, and other fish data as predictors of grayling distribution and abundance. Based on early analysis of data, restoration will create a 'niche' by improving habitats for grayling.

A close look at Big Hole habitat restoration: Jeff Everett (USFWS)

Jeff discussed specifics of several restoration projects in the Big Hole. The Big Swamp Creek Feedlot Project was discussed first. This project restored 1,100 feet of stream channel and associated floodplain. Prior to the project the stream was channelized and run through a confined animal feeding operation for nearly 60 years. Accumulated animal wastes were removed and spread on fields in the initial phase. Next a new stream channel was excavated in an old braid of the Creek. Riparian areas were enhanced using willow transplants and sod mats from a nearby wetland restoration project.

Jeff discussed the willow nursery project that was funded by NRCS through a Conservation Innovation Grant. Results from a survival study showed that 97% of the willows planted in Rock Creek in spring 2007 had survived.

Funding is currently in place to produce approximately 20,000 willow plants every year for the next three years. The next group of 20,000 plants is scheduled to be planted in the Big Hole on April 19th and 26th at 9AM in Wisdom.

There are many projects going on in the Big Hole right now, none of which are the 'magic bullet' to save grayling. The cumulative ecosystem effects of these projects however, will benefit the fish and the watershed.

Big Hole River 2007 Hydrology and CCAA Efforts – Mike Roberts (DNRC)

Over the last several years, snowpack has been below the long-term average whereas early spring temperatures have been above long-term averages. This scenario has created

a dynamic where spring runoff events are occurring about three weeks prior to typical runoff events.

Summer 2007 recorded below long-term averages for summer precipitation, and record mean daily maximum temperatures for July.(89° F) in Wisdom. Despite challenging environmental conditions, flows at Wisdom were maintained at a higher level than in years past – a testament to improved understanding and communication among agencies and landowners. In 2007 flow contributions from landowners totaled approximately 150.4 CFS, compared to 121.3 CFS in 2006

Plans for 2008 are to use BOR moneys to fund the installation of three Real-Time sites in the upper Big Hole River at the boundaries of CCAA Segments A, B, and E. DNRC is working on developing Flow Agreements for Site-Specific Plans.

A question was asked whether the flow targets in the CCAA are season specific. The flow targets in the CCAA were created using the wetted perimeter method and are presented as seasonally-adjusted targets in a normal water year.

Two questions were asked regarding the potential impacts of shifting from traditional hay production to pasture grazing. This dynamic is recognized as an ongoing issue; however, the majority of landowners still produce hay. This dynamic is affected by the price of hay, which is currently high, and the cost of shipping cattle, which is also high.

Long-Term Conservation Strategies: Tim Swanson and Nathan Korb (TNC)

Conservation Easements on several properties were discussed. In the Big Hole CCAA Project Area, the Nature Conservancy has secured a Conservation Easement with a landowner near Wisdom, MT. The ranch is a 2,600-acre property that has reaches of Rock Creek and Big Lake Creek.. These Creeks are historically important spawning tributaries for grayling. The Easement will help preserve the integrity of the ranch and will likely result in long-term conservation of both Rock Creek and Big Lake Creek.

TNC has also been working on easements in the Centennial Valley which will benefit long-term protection for the adfluvial grayling population. Recently an easement was secured on an 11,500-acre property that includes Fish Creek and Metzel Creek, historical grayling spawning creeks

The Alaska Basin Ranch in the Centennial Valley is also under a Conservation Easement. This Ranch features Red Rock Creek and Hellroaring Creek, a stream with highly variable flow paths and flow quantities. Stream restoration is being considered on this property.

CCAA Riparian Assessments and Grazing Strategies: Emily Rens (FWP)

In 2007 FWP secured a new position a Riparian Conservation Specialist. The initial focus of the position is in the Big Hole, working with landowners to develop riparian management plans as part of each landowner's CCAA site-specific conservation plan. The riparian management plan will consist of an initial riparian assessment and ranch

inventory. The plans will address weed issues, grazing plans, projects, vegetation monitoring, and grazing monitoring. Work is being conducted cooperatively with NRCS and FWP.

NRCS Riparian Assessments use 10 considerations in their scoring and establish photo points for long-term monitoring. Scores range from 0-100, with 0-50 being 'not sustainable', 50-80 being 'at risk', and 80-100 being 'sustainable'. Scores are reviewed with landowners and questions about scoring and our approach are answered and discussed. To date 62 miles of assessments have been completed on 14 properties.

Several examples of riparian management plans were discussed the various tools (stockwater wells, supplements, fencing, grazing rotations, etc.) that the Partners will use to develop and implement such a plan with a landowner. Addressing weed issues will be a primary concern in most plans. Goals of the plans are to have an upward trend in riparian score within five years and a sustainable rating after 15 years. Each landowner and operation is unique and the Partners are understanding of this dynamic. They approach each plan differently according to the needs of the landowner.

CCAA Habitat Monitoring Trends: Adam Petersen (FWP)

Monitoring efforts nationwide often fail to demonstrate project success when evaluating restoration projects. However, the Big Hole CCAA presents a monitoring scheme that will likely be effective in showing improvements and providing information for management activities.

Several examples of habitat improvement projects were discussed along with baseline data indicating that varying levels of habitat degradation exist in certain reaches of the Project Area. Improving the habitat in these reaches will likely lead to reductions in width-depth ratios, reduced stream temperatures, reductions in fine sediments, increased fish biomass, and increases in the grayling population.

Challenges to showing these improvements were also discussed. The idea of 'restoration' is often influenced by a time-perspective that causes us to focus on annual trends, and we often fail to acknowledge historic conditions that may have existed 50 or 100 years ago. Many other challenges exist to showing improvement, such as climate change, unrealistic expectations, non-enrolled landowner effects and grayling mobility.

NRCS 2007 CCAA Review: Kyle Tackett/Jim Olson (NRCS)

NRCS has been a valuable partner in the CCAA, providing funds and technical assistance to deal with many issues. Primary responsibilities have included Riparian Assessments, Grazing Plan Development, Feedlot Compliance, Cost Share Programs, and Partnership Efforts. NRCS partnered with FWP to complete 62 miles of Riparian Assessments in 2007. Approximately 60,000 acres of land were also inventoried for the development of grazing plans. NRCS has also partnered with USFWS and FWP to address several feedlot issues.

NRCS has provided funds since 2005 for a DNRC Hydro-tech and an FWP Fisheries Technician. EQIP has also been a valuable funding source for the CCAA. Over the last several years, they have provided cost-share funding for 67 irrigation structures. Between 2008 – 2010, 107 more irrigation structures will be installed.

Award Presentation: Buddy Drake recognized Dick Oswald for his career contribution to grayling conservation. A plaque was presented to Dick and he received a standing ovation from the crowd for his decades of service to grayling research and conservation.

Session II: Reintroduction Efforts and Research :

Reintroduction Efforts: Emily Rens (FWP)

This presentation discussed restoration efforts in the Ruby and Sun Rivers, and the status of the Madison River brood stocks, other populations, and remote site incubators (RSIs).

Egg collection at Green Hollow Brood Pond resulted in 85% eye-up and a total of 140,000 eggs for use in RSIs. Egg collection at Axolotl Brood Pond resulted in 40% eye-up and a total of 66,000 eggs for use in RSIs in the Sun and Ruby

The Missouri River headwaters area was last stocked in 2006, and was not sampled in 2007. No grayling were captured in 2006.

Dave Yerk and crew out of Choteau have been monitoring the Sun reintroduction efforts using a combination of angling, tagging, snorkeling, electrofishing, and trapping in various Sun River drainages. RSIs were unsuccessful in producing fish last year. Only one grayling was captured last year, and this was captured in a trap in Gibson Reservoir. 25 to 30 RSIs will be used in the Sun River in 2008.

The Ruby River received two rounds of RSIs. The first round produced approximately 80% emergence of fry, whereas the second round produced low levels of emergence. Two reaches of the Ruby were electrofished in the spring and nine sections were electrofished in the fall, resulting in 25 and 129 grayling, respectively. Most grayling appear to be staying in the headwaters, and few grayling are found below Warm Springs Creek.

Habitat improvement projects in the Ruby include spawning gravel enhancement projects by the USFWS, improvements to irrigation infrastructure, and restoration of Lazyman Creek fencing, revegetation and stream channel work, and a water lease are components of this project. Other projects included construction and restoration of 9 high quality pools on the Ruby River. Streambanks were stabilized, cover was added, and pools were enhanced on 3,500 feet of river. Deployment of 32 RSIs are planned for the Ruby in 2008.

Beach seining in Ennis Lake downstream of the Madison River resulted in no grayling captures in 2007. No electrofishing surveys were completed in 2007. Sunnyslope canal

was not sampled in 2007. Plans for 2008 are to introduce Sunnyslope grayling into Tunnel Lake.

A Return of Grayling to Grayling Creek: Todd Koel/ Mike Ruhl/ Derrick Rupert (NPS) and Austin McCullough (FWP)

These presentations summarized a trip taken to the headwaters of Grayling Creek in in Yellowstone National Park in September of 2007 in an effort to assess the creeks potential for reintroduction of grayling and westslope cutthroat trout. The reach assessed began at highway 191, seventeen miles north of West Yellowstone and extended ten miles upstream to the headwaters. Different habitat and stream characteristics were noted during the trip and measurements were taken on pools and tributaries. Tributaries were assessed as potential RSI sites. A potential barrier formed by a scarp created from an earthquake in the 1950's will act as the lower end of the project area, which will total approximately thirteen miles. Additional data will be collected in 2008 to assess the projects feasibility. This includes installing three thermographs and one continuous flow-gauging device to monitor annual temperature and flow regimes of the creek. Additionally, assessments of a three-mile reach between highway 191 and the proposed barrier site need to be made for grayling habitat and other potential RSI sites.

Whats Next for Gibbon River Grayling: Todd Koel (NPS)

Amber Steed's project in the Gibbon River showed that the fluvial form of Arctic grayling likely does not exist in the Gibbon River. Rather, fish captured in the Gibbon River are likely adfluvial forms originating from the headwater lakes that were introduced in the 1920's. Reintroduction of the fluvial form of grayling would likely be accomplished through chemical and mechanical removal of non-natives and through the introduction of incubator reared fluvial grayling stocks. Numerous political and logistic challenges are likely for this to occur.

Big Hole Grayling Movement Research: Shane Vatland (MSU)

This presentation reviewed the grayling-tagging database that showed patterns of movement by grayling. Of the grayling that were captured in the spring and captured again in the fall of the same year, most had moved downstream. Of the grayling that were captured in the fall and captured the following spring, most had moved upstream. When comparing spring-spring recaps and fall-fall recaps, grayling tended to show strong seasonal site-fidelity.

Snorkel surveys were conducted throughout the summer in 2007. These surveys showed grayling were unevenly distributed in tributaries, with the majority of bigger grayling being found in lower reaches during the summer. Bigger fish were observed in lower numbers in the fall, prior to electrofishing surveys.

Over 900 individual fish including brook trout, rainbow trout, brown trout, mountain white fish, catostomid species and Arctic grayling received pit tags in the fall 2007. Seven Pit tag antenna stations were operated in 2007 in tributaries and on the mainstem Big Hole to track tagged fish. Most of the tagged fish were documented leaving

tributaries for the mainstem river, sometime between late September and early December. A tagging experiment this summer showed 100% survival of PIT tagged fish in a brood pond.

Stations will continue to be operated in 2008. Handheld, mobile-antenna station that is capable of collecting PIT tag information to gather more fine-scale information on habitat use will also be used. This information will be coupled with habitat, flow, and temperature data to get a better understanding of grayling movement in relation to these variables

Additional data will be gathered on temperature in 2008. A forward-looking infrared (FLIR) flight is being scheduled for July that will show temperatures of the Big Hole and tributaries over a wide spatial scale. In addition stream temperature profiling will be used as a means of identifying coldwater inputs in several streams.

Arctic Grayling Genetics Research Project – Doug Petersen (USFWS)

Doug discussed preliminary results of a genetics project he is conducting with Bill Ardren. The study is aimed at describing the population structure of grayling. Results from the study could give insights into grayling biology, population viability, and historic impacts from past stocking efforts.

For this study, 730 individual grayling samples were analyzed using microsatellite analysis. Samples were excluded for analysis when less than 30 fish were available for a specific location. Ten variable loci were chosen for analysis. Allele frequencies of these variable loci were measured for a descriptive summary of the population structure and an analysis of population viability.

Preliminary results show that evidence of large-scale population structure exists between the groups analyzed. Big Hole grayling and brood populations derived from Big Hole grayling appear genetically divergent from other populations and were shown on the dendrogram as a separate grouping. Additionally, grayling from Miner Lake and Mussigbrod Lake in the Big Hole drainage appear distinct from both Big Hole River grayling and other lake populations analyzed. Bobcat Lake grayling in the Big Hole drainage appear to be derived from Red Rocks grayling, which are also divergent from other populations analyzed. Madison River grayling may also be categorized as a unique grouping. The genetic differences between groupings is likely due to isolation by distance.

Preliminary results also indicate the population structure between various groups of grayling in the Big Hole River is somewhat similar. This lack of sub-structure indicates that discrete spawning units may not exist in the Big Hole. The effective population size of Big Hole grayling was rather high, when compared with other populations.

No strong evidence was found that indicated stocking has had an effect on the population structure of native grayling. Data also indicates that many introduced populations of grayling were founded from Red Rock Lakes fish.

Session III: Partners Perspectives for Grayling Restoration

Big Hole Adjudication Process and Update: Andy Brummond

Andy gave background on the process of adjudication and discussed the process of claims examination. Currently, the Big Hole is under a 'Temporary Preliminary Decree'. To move to the 'Preliminary Decree', a series of steps must occur. The 'Notice of Decree' is followed by a 'Notice of Objection'. A 'Comment and Objection Period' is open, after which time objections are resolved. A 'Master's Report' is then issued, and if adopted, the 'Preliminary Decree' stage is initiated.

The DNRC's role in the adjudication process is to provide technical assistance. They conduct claim examinations, field investigations, and serve as the record keeper. When conducting a claim examination, DNRC generally looks for historical contradictions and overlapping claims. When issues are identified, the claimant is contacted, and questions are answered and resolved. When issues cannot be resolved, an issue remark is made on the claim.

Approximately 2/3 of Big Hole claims have an issue remark associated with them. Most of these issue remarks address irrigation expansion.

Perspectives on not listing Arctic grayling: Mike Bias (Big Hole River Foundation)

This presentation summarized the views held by his Foundation and provided insights into potential positive and negative outcomes of listing.

The perception that listing would lead to recovery by reviewing current figures was discussed. Currently, 1925 species are on the Endangered Species List as either Threatened or Endangered. The number of species listed increased in the 1990's, but has decreased in recent years. To date, 48 species have been removed from the list - 22 have been 'recovered', 17 have been reclassified due to data errors, and nine have gone extinct. Looking at only species that exist in the contiguous US, 15 have been recovered, seven have gone extinct, and 15 have been removed due to data errors. The rate of recovery is estimated at 1.1% for North American species, and no fish species have been recovered to date. A common perception that a listing would increase funding was evaluated and showed that relatively little funds are available for species recovery under Section 6 of the ESA, when compared to other federal funding sources.

Although the Foundation believes evidence suggests a listing is warranted, they are supporting the CCAA as an appropriate means of addressing species recovery in the Big Hole.

Session IV: Adfluvial Conservation Efforts

Red Rocks Grayling Review and Update – Glenn Boltz (USFWS)

Over the last forty years, USFWS has conducted numerous studies assessing abundance, presence and movement of grayling in the Red Rocks National Wildlife Refuge. Trapping studies were conducted in the 1960's, 1990's and early 2000's. Electrofishing and abundance estimates have been conducted since 1994. RSIs have been used in 4 Creeks from 200-2004.

In 2005, USFWS initiated a grayling telemetry study to assess movement patterns of fish in lower Odell Creek and the reservoir at lower Red Rock Lake. Goals of the study were to document fish movement and the habitat types used by grayling. In 2005, seven male grayling and 1 female grayling were fitted with radio tags. In 2006, six males and four females were fitted with tags and monitored. Most fish used the lower portion of Odell Creek throughout the spring, summer, and fall study period. In the winter, many fish migrated to the lake, near the inlet of Odell Creek, although some fish used lower portions of Odell Creek.

Conservation efforts focused on grayling are ongoing in the Red Rocks Wildlife Refuge and include: increasing the number of streams containing spawning fish, reducing competition with non-native fishes, minimizing land use practices that impact the watershed, and regulation changes.

Red Rock & Mountain Lake Grayling Monitoring Review: Dick Oswald (FWP)

Dick gave an update on the status of several grayling populations. Elk Lake once supported a grayling fishery but this population was apparently lost during a drought in the 1990's. Efforts to reintroduce grayling in Elk Lake are planned for 2008.

Grayling sampling efforts have been conducted annually in Red Rock Creek to monitor the spawning population of grayling. In general there has been a decline in catch-per-unit effort during that time period. The grayling size composition also appears to be changing to smaller-sized individuals. Condition factor of these fish also appears to be declining.

Big Hole Lakes with grayling are periodically monitored by FWP and include Twin, Pintler, Miner, and Mussigbrod Lakes. Monitoring data in Miner, Pintler and Mussigbrod Lakes show that Arctic grayling abundance is increasing, whereas brook trout abundance may be decreasing over time. Pintler Lake grayling appear in lower densities than other lakes, although they tend to display a higher condition factor.

What's Happening on Odell Creek? Jeff Warren (USFWS)

The presentation reviewed a collaborative project conducted by USFWS and Rebekah Levine (MSU), entitled, "Arctic Grayling emergence and development in Odell Creek, Red Rock Lakes National Wildlife Refuge, Montana. Grayling spawning in the Red Rocks system occurs in two creeks – Odell and Red Rock Creeks. Emergence and fry development in Odell Creek was examined in this study. Objectives were to determine timing of spawning and emergence of fry in Odell Creek, track fry movement in Odell Creek into Lower Red Rock Lake, and investigate fry habitat selection. Modified minnow traps were used to capture fry.

Results indicate fry emerged around July 9, when a spike in stream temperature occurred. Peak fry abundance during habitat surveys was observed July 14-22. No fry were trapped during the summer, although many were observed near the traps. By August most fry migrated out of trapping area, indicating they either went into Lower Red Rock Lake or upstream into Odell Creek. Results also indicate that most spawning likely occurs in the upper six km of Odell Creek, about three weeks later than Red Rock Creek.

Session V: Business

Travis Horton (FWP) – the MOU among agencies for grayling recovery and support is available online through the FWP website.

Next years meeting is tentatively scheduled for February 25, 2009 in Bozeman.