Governor's Upper Yellowstone River Task Force Annual Report 1999

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Governor's Upper Yellowstone River Task Force
5242 Highway 89 South
Livingston, Montana 59047

January 1, 2000

Dear Governor Racicot:

I am pleased to report that the Governor's Upper Yellowstone River Task Force has made great strides on many fronts in 1999. With your continued generous support, we were able to obtain much-needed funding through the Legislature's Reclamation and Development Grant Program. This funding has secured Montana's voice in developing a Cumulative Effects Investigation of the upper Yellowstone River.

As we entered our data acquisition phase this year, our research focus has solidified. Given the level of scientific investigation involved in an assessment of this kind, we developed a Technical Advisory Committee (TAC) to assist us. The function of the TAC is to review and coordinate our research investigations among the scientific community and partner agencies. Their preliminary review of our initial study work plan, provided the Task Force with the knowledge to expand the scope of our studies. The Task Force has fully endorsed this expanded scope of work and its subsequent comprehensive study program with an estimated cost of $1.5 million.

Task Force and community members review proposed studies, and get updates on ongoing studies at our monthly meetings. These culturally and scientifically based discussions help us to understand the complexity of the Yellowstone River and the interplay amongst its users, while also addressing the concerns, values, and needs of all interested parties.

By the end of 2000, we plan to complete the data collection component of several of our biophysical studies. Conversely, several studies that are still not funded, or are still under consideration, will not be completed within that time frame. As data becomes available, the Task Force will make it public and go to lengths to explain it to anyone who is interested. We want to make sure that people are aware of the data and what it can and cannot explain.

I want to give special thanks for the great help we have gotten from several of our project partners. The US Army Corps of Engineers has been working very closely with the Task Force since our inception, and has helped to sponsor inadequately-funded studies or studies finalized after the RDGP grant was written. I would also like to thank Montana's Congressional Delegation, the Montana Departments of Environmental Quality, Natural Resources and Conservation, and Transportation, as well as the Park Conservation District for their tremendous support. With their assistance, the Task Force has made great progress in our effort to assess the upper Yellowstone River. In addition, we have received valuable support from the Environmental Protection Agency, and Natural Resource Conservation Service. They have all played a major role in making this a great national project.

1999 saw the Task Force progress from talking about how to undertake a cumulative effects investigation on the upper Yellowstone River, to implementing one. We are confident that 2000 will build on our successes and prove to be just as productive.

Best regards,

John Bailey
Chairman

Governor's Upper Yellowstone River Task Force

1999 Annual Report

This 1999 Annual Report is the second report produced by the Governor's Upper Yellowstone River Task Force (here after referred to as the Task Force). The report's purpose is to provide information to the Governor and general public on the 1999 activities and accomplishments of the Task Force. The main objective of this year's report is to summarize 1999 activities accomplished by the Task Force. Past activities and the Task Force's long-term goals are also described.

Governor Racicot's vision of providing for a comprehensive and inclusive approach to resolving natural resource issues and promoting public participation has become a reality through Task Force actions. We have embraced this vision and strive to ensure that the integrity of the upper Yellowstone River remains intact, while balancing the needs of our communities and landowners.

Task Force History, Our Purpose, Who We Are

Created by Governor Marc Racicot in November 1997, the Task Force is a structured non-regulatory organization that was designed to address problems arising from the extreme flood events of 1996 and 1997. A multitude of actions taken in the wake of these floods helped many Montanans to realize that there was a real need for a more comprehensive and consolidated planning effort involving citizens, communities, and government agencies.

As broadly outlined in the Governor's Executive Order No.19-97 (see *Appendix A* to review document), the purpose of the Task Force is to provide a forum for the discussion of issues that effect the Upper Yellowstone River Basin, particularly, to bring together landowners, sportsmen and sportswomen, and community leaders to develop a shared understanding of the issues and competing values and uses that impact the upper Yellowstone River. Further, the Task Force is directed (1) to bring together many diverse groups, who have an interest in the upper Yellowstone River, and (2) to ensure that future projects affecting the river are planned and conducted in a manner that will preserve the integrity, beauty, values, and function of the upper Yellowstone River for Montanans now and in the future.

Members of the Task Force represent a wide cross section of citizens and local, state, and federal agency representatives (See *Task Force Member Profiles* for personal portraits of the members.). Individually, we represent specific constituencies within the local community; while as a whole, we form a "balanced table" of diverse groups strongly concerned about the natural and economic resources of the upper Yellowstone River. Having completed our initial, 19-month term in June 1999, the Office of the Governor officially continued the existence of the Task Force for two more years through Executive Order No. 8-99 (see *Appendix B* to review document).

The Task Force was developed in the true spirit of partnership and collaboration, with a twist. By design, the Task Force was set up to have community participants function in a leadership role. This was accomplished by splitting the Task Force into voting and non-voting memberships. The12 voting Task Force members represent community interest groups, specifically:

local businesses,
property owners,
ranchers,
angling community,
conservation group(s),
Park County,
City of Livingston, and
Park Conservation District.

The eight non-voting Task Force members are made up of state and federal governmental agencies, namely:

Montana Department of Environmental Quality,
Montana Department of Natural Resources and Conservation,
Montana Department of Transportation,
Montana Fish Wildlife and Parks,
National Park Service,
US Army Corps of Engineers, and
US Forest Service.

These members provide technical knowledge and assistance to the Task Force, in addition to their regulatory and land management input.

The Community Is Our Partner

The Task Force works to accomplish our mission in a consensus-building manner, which stresses education, cooperation, broad-based community involvement, and voluntary participation. We encourage all members of the community to get involved in Task Force activities and to express their views openly and in the spirit of teamwork.

Our main goal for 1999 was to set in motion biophysical and socio-economic investigations that will provide us with complete and comprehensive information about the Upper Yellowstone River Study Area. This scientifically based and interdisciplinary data will then be used to guide the Task Force toward equitable and sound recommendations that benefit the community and its resources. More specifically, valid and comprehensive scientific data will help us achieve one of our long-term goals of developing a set of publicly-supported river corridor management recommendations.

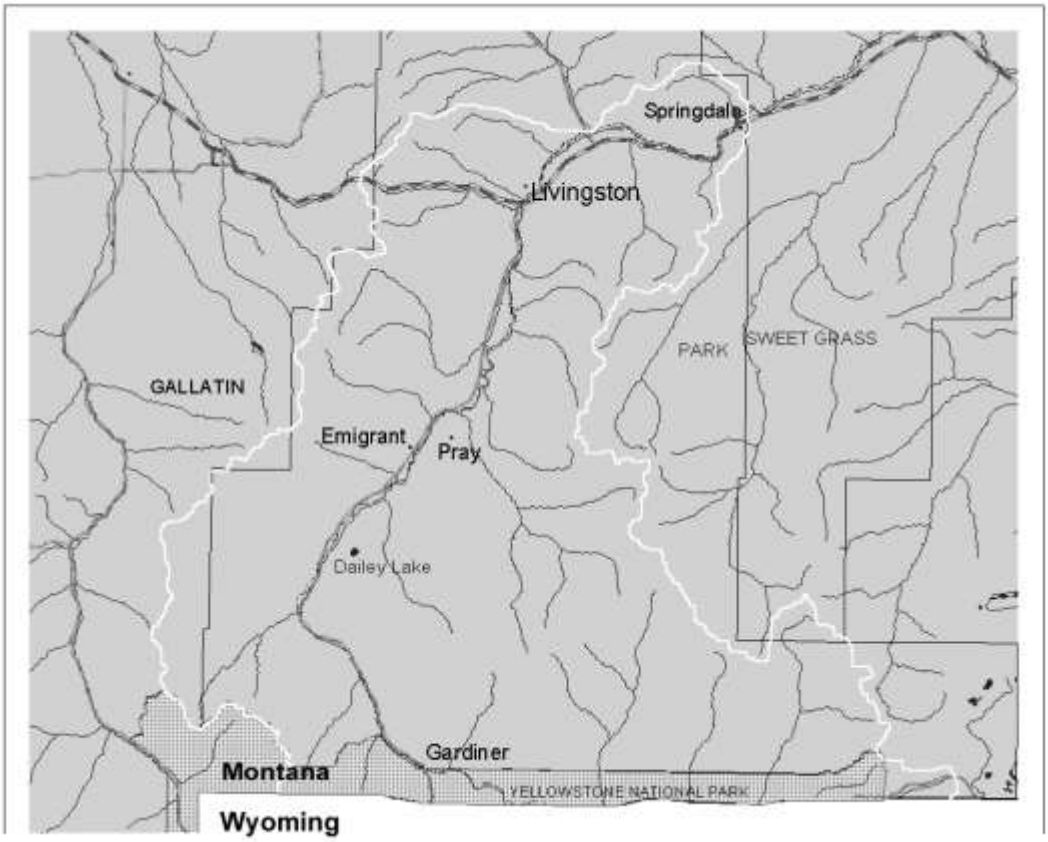
We plan to keep the public actively involved in this process by promoting open communication through outreach and educational activities, and disseminating all information collected in a timely and intelligible manner. Central to the development of management recommendations is our proactive effort to educate the public, landowners, and regulators by (1) presenting and explaining our research results, (2) identifying management options that we develop based on those results, and (3) exploring the possible effects of those options on the long-term health of the river and the human community that depends on it. Any information gathered by the Task Force belongs to everyone. Once completed, all survey results, maps, and other data will be available for the public's use and may be viewed or acquired at anytime. The Task Force encourages feedback from the community and hopes that people are motivated to become involved in our effort to keep the upper Yellowstone River vital for many generations to come.

Upper Yellowstone River Study Area

The Task Force's Upper Yellowstone River Study Area is defined as that reach of river (including its tributaries), beginning at the Yellowstone National Park boundary at Gardiner, Montana and extending downstream to the bridge crossing at Springdale, Montana. Flanked by the Crazy Mountain Range to the north, the Absaroka Mountain Range to the east, the Gallatin Mountain Range to the west, and Yellowstone National Park to the south, approximately 80 miles of the Yellowstone River flows within this 2,930 square-mile basin (see *Map 1*).

The upper Yellowstone River represents a significant and valuable natural and economic resource for some 14,500[1] local area residents within Park County, Montana. The river provides an environment that is attractive to permanent residents, tourists, and seasonal homeowners. Many varied industries rely heavily on the continued, long-term health of the river. A broad cross section of users— agriculture, natural resource industries, recreation, and market industries—depend on the river to provide the elements necessary to sustain successful operations. Consequently, the upper Yellowstone River and its continued health are highly valued as a regional and national treasure, while also integral to the local and regional economy.

The Yellowstone River, in this area, is considered a priority watershed for restoration and water quality plan development by several agencies. A multi-agency advisory group led by the Montana Department of Environmental Quality and the Department of Natural Resources and Conservation was formed in 1998 to identify priority watersheds, to target new federal watershed management funding, and to provide technical assistance. The work group, entitled the Montana Unified Assessment Work Group, has identified the upper Yellowstone River as a Category 1-A watershed[2]. Category 1-A watersheds are defined as those having immediate restoration needs with one or more agency designations as a priority area, coupled with the existence of a local group (that is, the Task Force) that has identified technical or funding needs. Further, the 1998 §303 (d) list[3] assigned the upper Yellowstone River a low priority for Total Maximum Daily Load water quality plan development. Priority is being revisited in the year 2000. Water quality impairment, which is addressed through this process, is likely caused by nutrients, metals, suspended solids, siltation, flow alteration, and habitat alteration[4].



Map 1. The Upper Yellowstone River Watershed, from Gardiner to Springdale Montana.
This map shows the Upper Yellowstone River Watershed and surrounding area. The watershed falls within Park County and is flanked by Gallatin and Sweet Grass Counties. The watershed boundary is depicted by a thick white line.

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[1] Source: U.S. Bureau of the Census. 1990.

[2] Source: October 1, 1998. *Assessment of Montana's Watershed Resource Needs; Clean Water Action Plan*. Montana Unified Assessment Work Group. This work group is now a subcommittee of the Montana Watershed Coordinator Council.

[3] The federal Clean Water Act section §303 (d) requires all states to compile a list of "water quality limited water bodies," prioritized in order of need for Total Maximum Daily Load development. The list must be updated biennially and the Environmental Protection Agency and Montana Department of Environmental Quality are the monitoring authorities.

[4] Source: Montana Department of Environmental Quality. 1998. Clean Water Act §303 (d) list.

Task Force Voting Member Profiles

John Bailey, Chairman, Fly Fishing Business Owner
John is the owner of the internationally-renowned Dan Bailey's Fly Shop in downtown Livingston. Born and raised in Paradise Valley, John has been fishing the upper Yellowstone River for more than 40 years. His home is located on a lagoon along the Yellowstone River.

Mike Atwood, Vice Chairman, Natural Resource Industry Representative
Mike is the Director of Lands for RY Timber, in Livingston. He and his family own property adjacent to the river. Mike has been active in natural resource issues involving private and public forest management for more than 20 years. He is a board member of the Yellowstone Spring Creek Foundation and was recently appointed to the FWP Future Fisheries Panel.

Roy Aserlind, Emeritus Professor, University of Wisconsin—Madison
Roy grew up in Livingston, and has owned a home on Ninth Street Island for 30 years, where he and his wife now live the year around.

Michelle Goodwine, CRS, ABR, GSI; President of the Montana Association of REALTORS®. Michelle has worked as a REALTOR® for 13 years and owns Coldwell Banker Mavervick Realty. Michelle and her husband, Bob, are Livingston natives and live north of town on the Yellowstone River.

Dave Haug, Park Conservation District Supervisor
The Haug family has been farming and ranching in Park and Sweetgrass Counties for three generations, since the turn of the century. As a Supervisor for the Park Conservation District, Dave's Board issues 310 permits on the Yellowstone River; he is also a member of the City/County Planning Board and a board member of the Livingston Ditch Association, which uses water from the Yellowstone. Currently, his family farms and manages timber on their property in the Upper Yellowstone River Study Area.

Tom Lane, local property owner along the Yellowstone River
Long time residents of the Livingston area, the Lane family owns and operates cattle ranches throughout the state of Montana. Tom's family business includes a large operation and land holding along the upper Yellowstone River. Tom was the recipient of the 1999 Conservation Farmer/Rancher of the Year award from the Meagher County Conservation District.

Jerry O'Hair, local property owner along the Yellowstone River
O'Hair family members are fourth generation Paradise Valley residents. Jerry owns and operates a working cattle ranch that adjoins the upper Yellowstone River for approximately three miles. The internationally famous Armstrong Spring Creek is also located on his ranch.

Brant Oswald, Conservation Group(s) Representative
Brant is a licensed Montana outfitter and co-manager of the Yellowstone Angler, a fly fishing shop in Livingston. He has served on the Board of Directors of both the Joe Brooks Chapter (Livingston) of Trout Unlimited and the Park County Environmental Council.

Rod Siring, local property owner along the Yellowstone River
Rod was born and raised in Montana, and he and his wife have spent the last 32 years in Park County. Rod is a retired Park Electric Cooperative manager, where he worked for 30 years. He enjoys fishing and boating on the Yellowstone.

Bob Wiltshire, Angling Community Representative
For more than 20 years, Bob has been closely involved with the fishery of the Yellowstone River. Employed by the Federation of Fly Fishers, Bob has 15 years of outfitting experience, a background in fishery management, is a frequent lecturer about fisheries issues, and contributes angling articles to a number of publications.

Ellen Woodbury, Park County Planner
Ellen has been the Planning Director and Floodplain Administrator for Park County since 1992. She was nominated by the Park County Commissioners to represent the County on the Task Force. Ellen graduated from Montana State University and attended graduate school at Western Illinois University in Macomb, Illinois.

Jim Woodhull, City of Livingston Planner
Born and raised in Livingston, Jim has been with the Livingston City Planning Office since graduating from Montana State University, Bozeman in 1992.

Task Force Non-Voting Member Profiles

Wayne Brewster, Deputy Director Yellowstone Center of Resources
National Park Service, Yellowstone National Park
Mammoth, Wyoming

Stuart Lehman, Section Supervisor, Watershed Management Section
Montana Department of Environmental Quality
Planning, Prevention, and Assistance Division
Helena, Montana

John Logan, District Ranger
US Forest Service, Gallatin National Forest
Gardiner Ranger District,
Gardiner Montana

Terri Marceron, District Ranger
US Forest Service, Gallatin National Forest
Livingston Ranger District,
Livingston Montana

Joel Marshik, Tribal Affairs Coordinator and Manager, Environmental Services
Montana Department of Transportation
Helena, Montana

Laurence Siroky, Water Operations Bureau Chief
Montana Department of Natural Resources and Conservation
Flood Plain Program, Water Resources Division
Helena, Montana

Allan Steinle, Montana State Program Manager
US Army Corps of Engineers, Regulatory Branch
Helena, Montana

Joel Tohtz, Fisheries Biologist
Montana Fish, Wildlife, and Parks
Livingston, Montana

Liz Galli-Noble, Task Force Coordinator, is a forester, environmental studies educator, natural resource project manager, and technical writer/editor. She received a BA in History with teaching certification, and did science-based undergraduate studies at the University of Montana. She also received a Master of Forestry degree (honors) from Yale University. Liz has 15 years of experience working in the natural resource management field, both nationally and internationally. She served as a Peace Corps tropical forester and extension agent in Mali, West Africa. Other positions she has held include: technical editor for the Interior Columbia Basin Ecosystem Management Project, environmental educator in urban/inner-city surroundings, forestry researcher, Regional Supervisor for the Montana Conservation Corps, and US Forest Service technician/firefighter.

Technical Advisory Committee

A major goal for the Task Force is to develop recommendations to address controversial problems that affect a significant natural and economic resource, the upper Yellowstone River. It is essential that these recommendations be based on sound science, with full public disclosure and participation. In order to accomplish such a broad and challenging charge, the Task Force felt it necessary to appoint a Technical Advisory Committee (TAC) to assist us in this effort.

The overall goal of the TAC (redefined in the 1999 Ground Rules revision, see *Appendix D*) is to provide recommendations to the Task Force when requested, based on the results of the scientific investigations. The TAC is given both broad direction and specific missions by the Task Force, and has the flexibility to determine how best to accomplish its job. The TAC has no authority to make policy decisions or recommendations on behalf of the Task Force; its role is to work as directed by the Task Force to ensure that:

- the right questions are asked,
- the best approach and methods are used to answer questions,
- the data collected are objective, defensible, and trustworthy, and
- the answers provided are understandable and relevant.

1999 Task Force TAC Members

Dr. Duncan Patten, Chairman	Riparian Ecologist	Montana State University
Chuck Dalby	Hydrologist	Montana Department of Natural Resources and Conservation
Mike Gilbert	Environmental Resources Specialist	US Army Corps of Engineers
Tom Hallin	Professional Surveyor	Private Survey Business
Rob Hazlewood	Wildlife Biologist	US Fish and Wildlife Service
Jim Robinson	Geologist	Montana Department of Natural Resources and Conservation
Dr. Greg Schildwachter	Wildlife Biologist	Intermountain Forest Association
Brad Shepard	Fisheries Biologist	American Fisheries Society
Allan Steinle	Environmental Resources Specialist	US Army Corps of Engineers

Profiles

Dr. Duncan Patten, Chairman of the TAC, is Research Professor with the Mountain Research Center at Montana State University, Professor Emeritus of Plant Biology and past director of the Center for Environmental Studies at Arizona State University. Dr. Patten received the AB degree from Amherst College, MS from the University of Massachusetts at Amherst, and PhD from Duke University. His research interests include arid and mountain ecosystems, especially the understanding of ecological processes and restoration of western riparian and wetland ecosystems. He was Senior Scientist of the Bureau of Reclamation's Glen Canyon Environmental Studies, overseeing the research program evaluating effects of operations of Glen Canyon Dam on the Colorado River riverine ecosystem. He is

involved with restoration of the Provo River in Utah. Dr. Patten was founding president of the Arizona Riparian Council, and is past-president of the Society of Wetland Scientists. He is a Fellow of the AAAS; has been a member of the National Research Council's Commission on Geoscience, Environment, and Resources Board on Environmental Studies; and has served on and chaired several NAS/NRC committees.

Chuck Dalby is a hydrologist with the Montana Department of Natural Resources and Conservation (Water Resources Division, Helena Montana). His education (BA and MS degrees in geology from University of Montana) emphasized sedimentary and glacial geology, surface-water hydrology, and fluvial geomorphology. Chuck's professional interests are in: watershed management and cumulative effects of land use; measurement and monitoring of sediment transport and channel changes in gravel-bed rivers; application of river-channel classification and historic stability assessment to river-corridor management; design and implementation of channel maintenance flows; and analysis and maintenance of irrigation water quality (salinity and trace elements). Currently he is assisting with the Upper Yellowstone River Cumulative Effects Investigation (Historic Channel Changes and Geomorphology). Other recent projects include: cooperative research (with USGS, MSU, and UM) to determine the downstream fate of geothermal arsenic as it moves through water and irrigated soils of the Upper Missouri Basin; design and implementation of water-quality monitoring to support adaptive management of Madison-Missouri River hydro projects; evaluation of channel changes and stability of the Yellowstone River proximate to the Livingston Ditch; design, monitoring, and implementation of flushing flows to remove fine-sediments sluiced from Ruby Reservoir; and measurement of a sediment budget for Nevada Creek Reservoir.

Mike Gilbert is an Environmental Resources Specialist with the Omaha District, US Army Corps of Engineers. Mr. Gilbert holds a BS, 1977, and MA, 1980, in Biology from the University of Nebraska at Omaha. For the past 22 years, he has worked in the Corps' regulatory program, responsible for regional studies including wetlands inventory, geographic information system applications, and major regulatory actions. He also serves as the Omaha District's wetland specialist, supporting not only the regulatory program, but also natural resources management and Superfund activities. Major emphasis of his work is in wetlands community ecology; focusing on plant community characterization and dynamics with applications towards wetlands mapping, functional assessment work, impact assessment and mitigation.

Thomas J. Hallin is a Professional Engineer and Land Surveyor. Mr. Hallin received a BS (Mining Engineering) from Montana School of Mines while a Navy V-12 student in 1944 and was subsequently commissioned Ensign (E) USNR from the US Naval Academy. He served as an Engineer Officer on the submarine S-11 and the USS Gratia (AKS-11) in the American and Asiatic theaters and was discharged to the Inactive Reserve in 1946. His subsequent experience includes 1 year as a Mining Engineer for the Northern Pacific Railroad;14 years as Manager of Construction and Engineering for the Yellowstone Park Company; and 40 years of self-employment on numerous engineering and surveying projects in Montana, including affiliated assignments with communication companies as a consultant in the western United States, Alaska, Hawaii, Jamaica, and Africa. He is also a Fellow Member of the Montana Association of Registered Land Surveyors.

Rob Hazlewood is Senior Staff Biologist with the US Fish and Wildlife Service (USFWS) Ecological Division in Helena, Montana. He received an AA degree in Marine Biology and BS/MS degrees in Wildlife Management from Humboldt State University at Arcata, California. He has 24 years experience as a professional wildlife biologist with special interests in western riparian habitats, wetlands, and avian ecology. He is the USFWS eight-state, Rocky Mountain Region representative on the National Bald Eagle Team and Western Peregrine Falcon Recovery Team.

Jim Robinson is a Water Resources Planner with the Department of Natural Resources. Mr. Robinson received his AB degree in geology at the University of California, Berkeley and his MS in geology from the University of California at Santa Cruz. He has worked for the State of Montana for the past six years: first as an environmental impact specialist analyzing the effects of large-scale mining operations, later as a project coordinator for the Tongue River Dam Project, and currently as a planner assisting watershed groups. Prior to working for the State of Montana, Mr. Robinson was employed by geotechnical and

environmental consulting firms. His experience includes management of environmental impact studies for a variety of public and private development proposals, with emphasis on geomorphic and hydrologic effects of flood control and riverine sand and gravel mining operations. His geologic experience includes preparation of construction-related geologic reports such as geologic hazard assessments, soil and foundation investigations, and grading and compaction reports. Mr. Robinson is a registered professional geologist in California.

Dr. Greg Schildwachter is Wildlife Program Manager for the Intermountain Forest Association (IFA), which represents forestry companies in Idaho, Washington, Montana, Wyoming, South Dakota, and Colorado. As IFA's wildlife biologist based in Missoula, Greg oversees projects that promote and sustain forests and wildlife in Montana and Idaho. Greg holds a PhD in Wildlife Biology from the Boone and Crockett Research Program at the University of Montana, where he studied agreements to conserve endangered species on private land. He earned a Master of Science degree at the University of Tennessee, and a Bachelor of Science, Forest Resources, degree at the University of Georgia. Before his fellowship with the Boone and Crockett program, Greg studied at the Political Economy Research Center in Bozeman, Montana, and worked with the Caesar Kleberg Wildlife Research Institute in Kingsville, Texas. He has also worked with the US Fish and Wildlife Service, the Southeastern Cooperative Wildlife Disease Study, and the National Wildlife Federation.

Brad Shepard is a Fishery Biologist for Montana Fish, Wildlife and Parks (FWP), adjunct professor at Montana State University (MSU), and represents the Montana Chapter of the American Fisheries Society (AFS) on the TAC. He received a BS degree in Fish and Wildlife Management from MSU and an MS degree in Fishery Resources from the University of Idaho. He presently is an associate editor of the North American Journal of Fisheries Management, chairs a Westslope Cutthroat Trout Technical Committee for FWP, and conducts research into the conservation of native fishes and effectiveness of habitat restoration projects for FWP and the Montana Cooperative Fishery Research Unit at MSU. During his 20-year tenure with FWP, Mr. Shepard has been involved with basin-wide studies of fish and their habitats in the upper Flathead River basin; studied and made recommendations regarding reservoir drawdown levels in Libby Reservoir; served as a cooperative Fishery Biologist with FWP and the Beaverhead National Forest, where he studied the effects of land management activities on salmonids; and worked as a Fish Management Biologist in the Upper Yellowstone River Basin. He has served as President of the Montana Chapter of AFS, as chair of the Montana Association of Fish and Wildlife Biologists, and as a member or chair of numerous AFS and FWP committees. He and his family have resided in Livingston since 1990 and they spend lots of time on the Yellowstone River.

Allan Steinle has worked for the US Army Corps of Engineers since 1982, holding positions as a range conservationist at Lake Sakakwea in North Dakota, staff biologist at the Omaha District Office, Park Manager at Lewis and Clark Lake in South Dakota, Regulatory Project Manager in Nebraska, and Regulatory State Program Manager in Montana. Allan's current job involves overseeing the administration of Corps regulatory authorities under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. He moved to Montana in July 1998, after attending college in Arizona, Oregon, and South Dakota. Allan received a BS from Oregon State in Range Management. He is a member of the Society of Wetland Scientists.

1999 Work Plan
Cumulative Effects Studies and River Corridor Assessment

Overview

The overall goal of the Task Force is to develop a set of publicly-supported river corridor management recommendations that address potential adverse cumulative effects of river channel modification and flood plain development on the human community and riparian ecosystem. Development of management recommendations will involve identification and evaluation of the upper Yellowstone River's natural and economic resources. Development of the management recommendations involves five major phases:

I. Resource data collection, analysis, and mapping.
II. Resource condition assessment.
III. Development and evaluation of management options.
IV. Selection of preferred options to achieve goals and objectives.
V. Preparation of management recommendations.

The Task Force is involved in all phases of management recommendation development. Through its Technical Advisory Committee, the Task Force directed significant effort in 1999 toward developing coordinated, detailed work plans and costs for the Cumulative Effects Investigation (phases I and II above) needed to serve as a basis for the management recommendations.

To track and guide the various information gathering and resource assessment activities, a Draft Work Plan has been developed. Contained within the Work Plan are the data collection and resource assessment efforts that will allow the Task Force to make informed recommendations regarding management of the Upper Yellowstone River Study Area. Implementation of the Work Plan serves the following objectives:

A. Provide the Task Force, landowners, and the public with a more complete understanding of the issues, resources, and uses that affect the integrity of the Upper Yellowstone River Study Area.

B. Help explain how and why key elements of the watershed and river have changed over time.

C. Provide the Task Force and regulatory agencies with the information and analytical techniques necessary to evaluate river channel and flood plain problems and proposed solutions.

Information gained through Work Plan implementation will also assist regulatory agencies in developing a permit process tailored to local environmental conditions and Task Force recommendations. A prime example of this consolidated effort is the interaction between the Task Force and the US Army Corps of Engineers. The Corps, who has been charged by Congress to develop a Management Plan for the upper Yellowstone River, is working with the Task Force to accomplish that obligation (see *Collaboration and Partnerships* for detailed discussion).

Integrated Project Design

An interdisciplinary research effort, to assess the cumulative effects of bank stabilization (and other channel modification) on the physical, biological, and cultural attributes of the upper Yellowstone River, was begun in 1999. The investigation consists of seven interrelated components (see *Figure 1*):

1. Watershed Conditions and Land Use
2. Topographic Mapping and Geomorphology
3. Hydrology and Hydraulics
4. Riparian Vegetation
5. Fish Habitat and Populations
6. Wildlife Habitat and Populations
7. Socio-economic

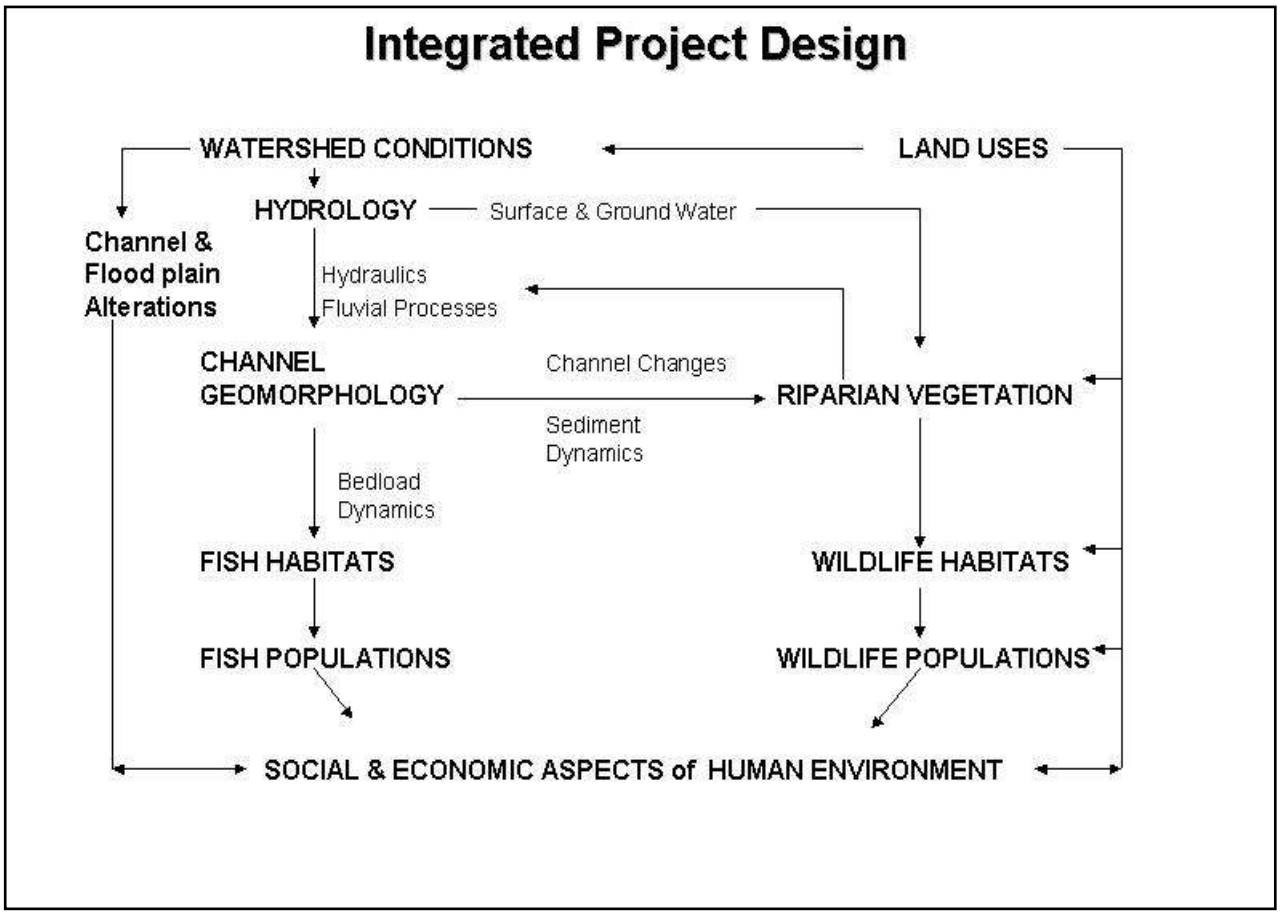

Figure 1. Upper Yellowstone River Cumulative Effects Study.
This conceptional model shows the links amongst the seven interrelated components in the upper Yellowstone River investigation.

These research components are in various stages of progress. Components 2, 3, 4, and 5 have received full or partial funding and were initiated in late 1999. Components 1 and 6 are in the planning and review stages, and are not fully funded. In addition, the social and economic component 7 that will translate physical and biological cumulative effects into anticipated effects on the human environment, is also in the planning stages and has not been funded.

Although research methods vary for each of the seven components, there are similarities in the approaches proposed to assess potential cumulative effects:

a. Survey, sampling, mapping and other descriptive (statistical) methods are used to quantify resource attributes of interest.

b. For resources with historic information, retrospective analyses will be used to describe changes over time and explore cause and effect relationships.

c. Where the state-of-the-art and the data collected allow, predictive models will be developed to provide a basis for estimating potential physical and biological effects of alternative bank stabilization techniques and schemes.

Coordination and consistency between study components, particularly with respect to stratification and selection of sampling and detailed mapping sites, will be achieved through oversight by the Task Force Technical Advisory Committee.

The six biophysical components form a cascade in which the attributes of each successive (or parallel) component are affected by processes and interactions within or between previous components (*Figure 1*). This hierarchical relationship is recognized and accounted for in the integrated project design and timeline (see *Figure 2*).

For example, data collected on Watershed Conditions and Land Use (component 1) will be used to describe the overall physical and biological setting of the upper Yellowstone River Watershed; analysis of information collected at several points in time provides a basis for describing how watershed conditions and land uses may have changed over time. This watershed perspective provides an important overall context for the cumulative effects analysis. Although the cumulative effects analysis is necessarily focused at the channel and flood plain scale, other factors may influence river channel processes and must be considered at the watershed scale.

At the next level of analysis, historical information and model-based predictions from the geomorphic and hydraulic process analysis (components 2 and 3) will set the stage and partially determine potential impacts of channel modification(s) on physical channel characteristics and riparian vegetation (component 4). Estimated changes in channel morphology, hydraulics, and riparian vegetation, will in turn, drive predictions of effects on fish and wildlife habitat and populations (components 5 and 6). Ultimately, estimates of cumulative effects on channel and flood plain resources will be used to assess socio-economic effects on local stakeholders (component 7).

Given the complexity of the upper Yellowstone River, researchers recognize that the analysis cannot produce definitive, site-specific predictions of cumulative effects—inherent natural variation and associated uncertainties limit this outcome. Instead, realistic physically and biologically based scenarios will be developed for analysis with TAC (and Task Force) oversight. These scenarios will provide the basis for analyzing the cumulative effects of different types and levels of bank stabilization and flood plain modification on the physical and biological environment. In this manner, scientifically sound predictions, of how the river and its resources will likely change in response to a particular channel modification or group of modifications, will be developed. This information will then be used by the Task Force as a partial basis to develop sound river corridor management recommendations.

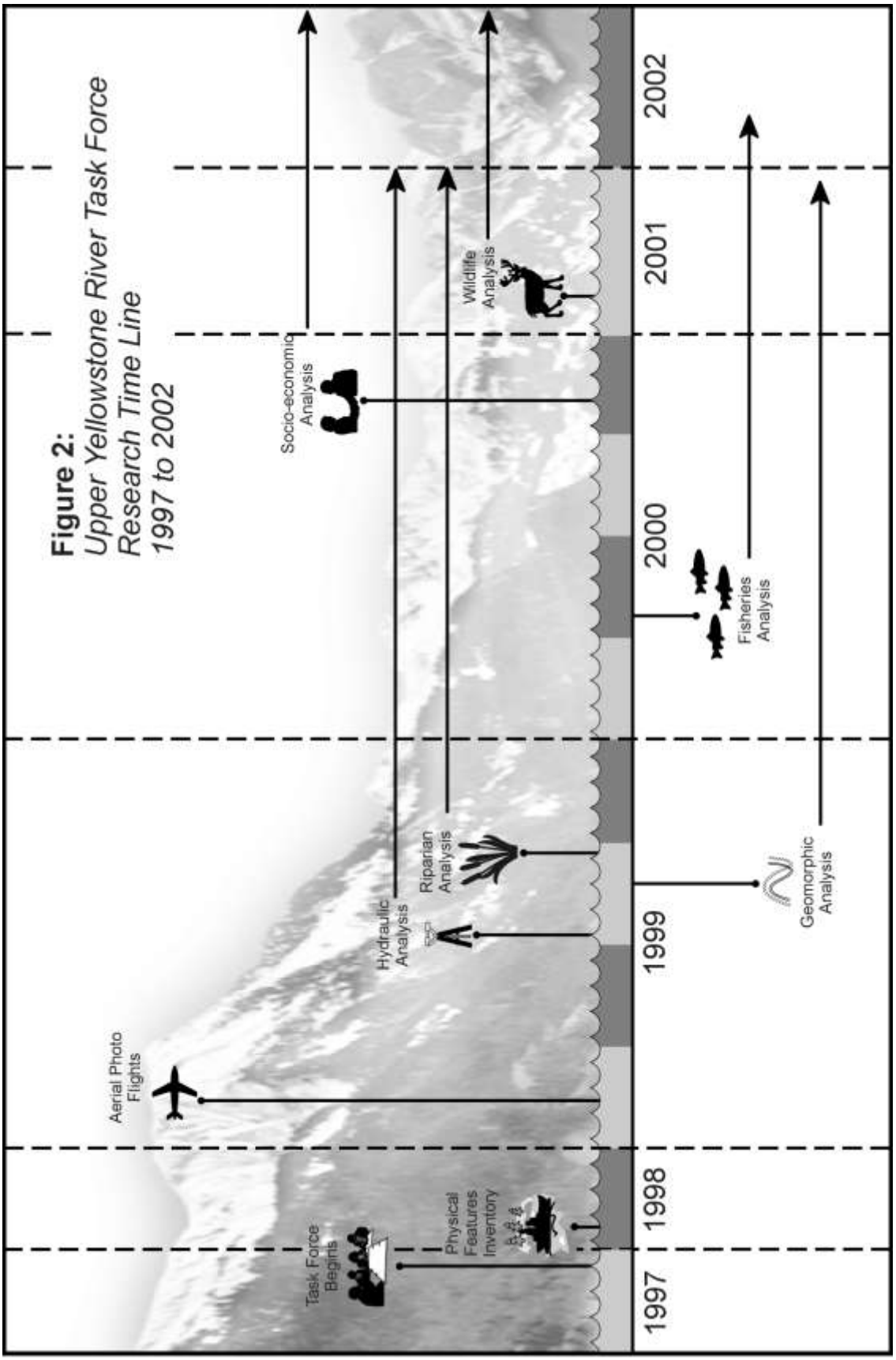
Figure 2:
Upper Yellowstone River Task Force
Research Time Line
1997 to 2002
1997
1998
1999
2000
2001
2002
Task Force Begins
Physical Features Inventory
Aerial Photo Flights
Hydraulic Analysis
Riparian Analysis
Geomorphic Analysis
Fisheries Analysis
Socio-economic Analysis
Wildlife Analysis

Research Component Status Report

The following sections identify and describe various studies that are included within the Task Force Work Plan.

Watershed Conditions and Land Use

- Yellowstone River Physical Features Inventory
- Aerial Photography
- Riparian/Wetlands/Land Use Mapping or Natural Resources Inventory
- Watershed Land Use Analysis

Topographic Mapping and Geomorphic Analysis

- Topographic Mapping
- Geomorphic Analysis

Hydrology and Hydraulic Analysis

Riparian Analysis

Fisheries Analysis

Wildlife Analysis

Social and Economic Analysis

Watershed Conditions and Land Use

Yellowstone River Physical Features Inventory

Title: Yellowstone River Physical Features Inventory–Gardiner to Springdale

Principal Investigators: Thomas Pick
Collaborative position with USDA Department of Natural Resource Conservation, and Montana Department of Environmental Quality

Other Participants: Task Force members, Montana Fish Wildlife and Parks, US Forest Service, Montana Department of Natural Resources and Conservation, Montana Department of Transportation, US Army Corps of Engineers, and local area outfitters and consulting firms.

Goal: Compare the degree of change in specific physical features within the upper Yellowstone River corridor from past (1987) to current (1998) conditions.

Progress: Completed 1998.

The *Yellowstone River Physical Features Inventory–Gardiner to Springdale* was conducted in a collaborative effort by the Task Force, USDA Natural Resources Conservation Service, and the Department of Environmental Quality in April 1998. The purpose of the study was to compare the degree of change in specific physical features within the river corridor from past (1987) to current (1998) conditions. Past conditions had been compiled in a similar inventory conducted in 1987.

The physical features inventory was conducted as a first step in understanding cause and effect relationships in the Upper Yellowstone River Study Area. The results of this inventory have served as a prioritization tool to guide further data acquisition and analysis efforts by the Task Force. A full description and the results of the study were reported in *The Upper Yellowstone River Task Force 1998 Annual Report*.

In November 1999, an electronic version of the physical features inventory was made available on the Natural Resource Information Systems (NRIS) web page. The information was digitized from geo-referenced, non-rectified aerial photographs. The resulting line and point coverages have been determined to be accurate to a scale of at least 1:100,000 using National Map Accuracy Standards. It is not the purpose of this electronic database to serve as a precise measurement tool at this time. Instead, the intent of providing this information via a web-page application is to:

1. further the use of various resource assessment tools by citizen groups;

2. illustrate how these tools may be used by decision makers and land users to understand the functions, processes, and structure of natural resource systems; and

3. inform the public of the resource assessment work underway in the Upper Yellowstone River study area.

You may access the Physical Features Inventory by visiting the NRIS home page at http://www.nrcs.usda.gov (click on *What's New*) or directly by accessing http://www.nris.webap/document/user.html. The inventory data is also available on compact disc (CD), which may be acquired at the Task Force Office at 5242 Highway 89 South, Livingston, Montana 59047 in 2000. Additional feature data from Task Force investigations will be added to this web site as they become available.

Aerial Photography

The US Forest Service initiated preparation of 1:24,000 scale ortho-photo coverage of the study area (Gardiner to Springdale) in November 1999. The mapping is based on low-flow (1,500 cubic feet per second) air photos obtained on April 11, 1999. Additional aerial photography (same date) was obtained for preparation of topographic mapping at scales of 1:6,000 (one-foot contours) and 1:8,000 (two to four foot contours), however this part of the mapping effort is not yet funded and $80,000 is currently being sought. Work on the 1:6,000- and 1:8,000-scale topographic mapping will be initiated, pending receipt of funding.

Funding Status: 1:24,000 mapping is fully funded; 1:6,000 and 1:8,000 mapping is not funded.

Riparian/Wetlands/Land Use Mapping

Title: Riparian, Wetlands, and Land Use Mapping for the Yellowstone River Corridor: Gardiner to Springdale, Montana

Principal Investigator: Chuck Elliott (Regional Coordinator)
US Fish and Wildlife Service, National Wetlands Inventory

Other Participants: US Army Corps of Engineers
Omaha District

Goal: Document land use and land cover within the study area corridor.

Objectives:

1. Document baseline conditions for impact assessment and alternatives analyses.

2. Serve as supporting data for other environmental investigations.

Progress: Aerial photography acquired in August 1999, draft photo-interpretation is currently underway.

Future Work:
Ground truthing/field verification scheduled for April of 2000. Final digital map production anticipated for the fall of 2000.

Funding Status: This study is fully funded.

Watershed Land Use Analysis
The Watershed Land Use Analysis proposal is still in the developmental stage. No funding has been secured for this study.

Topographic Mapping and Geomorphic Analysis

Topographic Mapping

Title: Topographic Mapping of the Upper Yellowstone River Channel and Floodplain from Gardiner to Springdale, Montana

Project Initiation Date: April 1999

Principal Investigators: Chuck Dalby (Hydrologist) and Jim Robinson (Geologist)
Water Management Bureau, Montana Department of Natural Resources and Conservation
Helena, Montana

Don Patterson (Land Surveyor)
Dan Maier, Ron Normandeau, and Bill O'Donnell (Photogrammetrists)
Region 1 Engineering, US Forest Service
Missoula, Montana

Other Participants: Marty VanAusdol (Land Surveyor)
Gallatin National Forest, US Forest Service
Bozeman, Montana

Goal: Acquire ground controlled aerial photos suitable for topographic and orthographic mapping of the contemporary upper Yellowstone River channel and flood plain; prepare digital ortho-photos and topographic maps suitable for flood plain and other resource delineation.

Objectives:

1. Establish horizontal and vertical control for aerial photography.

2. Acquire low-flow, 'leaf off', 1:24,000 scale aerial photography for the channel from Gardiner to Springdale for use in ortho-photo preparation.

3. Acquire low-flow, 'leaf off' , large scale (1:6000 or 1:8000 scale) aerial photography for the channel from Point of Rocks to Mission Creek for use in preparing one- and two-foot contour maps of the channel and flood plain.

4. Prepare ortho-photos and contour maps using digital photogrammetric methods.

Progress:
Topographic mapping of the river channel and flood plain provides the basic framework for describing contemporary river channel and flood plain resources, evaluating historic channel changes, hydraulic flood plain delineation, and monitoring future channel change. Contemporary topographic mapping, at small (1:24,000) and large (1:6,000 to 1:8,000) scales, will be accomplished using photogrammetric methods and aerial photos obtained April 11, 1999.

Survey-grade GPS methods were used to establish "centimeter-level" horizontal and vertical control for a network of 63 reference points that were placed in April 1999. These reference points were "targeted" prior to acquisition of low-flow (1,500 cubic feet per second) aerial photos on April 11, 1999. The US Forest Service initiated preparation of 1:24,000 scale ortho-photo coverage of the study area (Gardiner to Springdale) in November 1999. Additional aerial photography was obtained for preparation of topographic mapping at scales of 1:6,000 (one-foot contour) and 1:8,000 (two to four foot contours), *however* this part of the mapping effort is not yet funded and $80,000 is currently being sought. Work on the 1:6,000 and 1:8,000 scale topographic mapping will be initiated, pending receipt of funding.

Funding Status: This study is partially funded with $80,000 still needed.

Geomorphic Analysis

Title: Historical Channel Changes and Geomorphology of the Upper Yellowstone River

Project Initiation Date: September 1999

Principal Investigators: Chuck Dalby (Hydrologist) and Jim Robinson (Geologist)
Water Management Bureau, Montana Department of Natural Resources and Conservation
Helena, MT

Other Participants: Dave Amman, Larry Dolan, and Mike Roberts (Hydrologists)
Water Resources Division, Montana Department of Natural Resources and Conservation
Helena, Montana

Dr. Jane Horton (GIS/Range Management)
Water Resources Division, Montana Department of Natural Resources and Conservation
Helena, Montana

Don Patterson (Land Surveyor)
Dan Maier, Ron Normandeau, and Bill O'Donnell (Photogrammetrists).
Region 1 Engineering, US Forest Service
Missoula, Montana

Dr. Michael Merigliano (Riparian Ecologist)
University of Montana, School of Forestry
Missoula, Montana

Goal: Develop a quantitative framework for evaluating historic river channel changes and the physical effect that historic channel modification (for example, bank stabilization measures) may have had on the river and flood plain; also provide a partial basis for estimating the potential cumulative effect of contemporary river management alternatives.

Objectives:

1. Channel and Flood Plain Mapping
2. Geomorphic Channel Description/Classification
3. Mapping and Analysis of Historical Channel Changes
4. Geomorphic Analysis of Historic Channel Processes and Cumulative Effects of Hydromodification

Progress:
The project will map the contemporary river channel and flood plain, delineate historic river channel changes, and examine the relationship between historic channel modifications (for example levees, bank stabilization) and channel changes. Information will be used to assess cumulative effects of channel modifications on physical attributes (channel geometry, plan pattern, bed-material characteristics) of the upper Yellowstone River from Gardiner to Springdale, Montana.

Channel mapping and geomorphic classification (Tasks 1 and 2) were initiated in September 1999. Geomorphic classification of the Upper Yellowstone River provides a framework for understanding the relationship between the form and condition of the channel and the physical and biological processes that shape and maintain its bed, banks and island complexes. The Rosgen, Montgomery-Buffington, and Nanson-Croke channel classifications will be applied in cooperation with other investigators.

These classifications will serve as a basis for identifying homogeneous channel segments, assessing relative vertical and lateral channel stability, and identifying geomorphic strata from which representative samples can be extracted for further detailed study. Reconnaissance-level classification (1:24,000 scale) of the channel from Gardiner to Springdale was begun and channel attributes (sediment size, pool-riffle structure, sediment sources) were examined in the field at selected locations between Mallards Rest and Livingston.

Future Work:
In 2000, we will continue work on Objectives 1 and 2 and will initiate work on Objective 3. Fieldwork will be conducted in the early spring (prior to runoff) and mid-summer through fall. Most of the work will be done within the immediate river corridor, with access via the river channel and private land adjacent to the channel.

Funding Status: This study is fully funded.

Hydrology and Hydraulic Analysis

Title: Analysis of Hydraulic Characteristics, Flood Plain Delineation, and Sediment-Transport Investigations for the Upper Yellowstone River from near Gardiner to Mission Creek in Park County, Montana

Principal Investigators: Steve Holnbeck (Hydraulic Engineer),
Chuck Parrett (Supervisory Hydrologist)
US Geological Survey, Water Resources Division
Montana District Office

Other Participants: Dave R. Johnson (Senior Hydrologic Technician). Other staff within the Montana District as required, and US Geological Survey technical experts outside the District on a consultation basis.

Goal: Analyze the potential effects of river management and bank stabilization alternatives on sediment load, channel geometry, streambed profiles, and water surface elevations.

Objectives:

1. Obtain channel geometry data at approximately 140 cross sections for the reach from Point of Rocks to the mouth of Mission Creek.

2. Delineate 100-year flood limits from Gardiner to Springdale. For the reach from Point of Rocks to Mission Creek, delineate the 100-year flood plain and floodway, and 500-year flood plain.

3. Perform hydraulic and sediment-transport modeling to estimate relative changes in channel geometry, streambed profiles, and water surface elevations resulting from different sediment loads and water discharges.

Progress:
Field work began in July 1999. Approximately 90 cross sections have been surveyed and tied to the North American Vertical Datum (NGVD) of 1988. Horizontal positions of pins locating the ends of surveyed sections were related to the North American Datum (NAD) of 1983 using a precision lightweight GPS receiver (PLGR). Of the 90 cross sections surveyed, about 15 fall between Mission Creek and Livingston, and about 75 fall between Livingston and Point of Rocks. Work is considered ahead of schedule, due in part to mild fall weather.

High-water marks for the 1996-97 and 1999 runoff periods were also surveyed and related to 1988 NGVD. The 1996-97 marks will be used to help calibrate the water-surface profile modeling efforts. In addition, the 1999 marks will be used to define a “high-flow” profile. Survey of a “low-flow” profile from near Point of Rocks to near Mission Creek was performed in the late fall of 1999. The “high-flow” and “low-flow” profiles, plus a “normal-flow” profile (yet to be surveyed), will provide the US Geologic Survey-Biological Resources Division (USGS-BRD) with needed information to conduct planned studies.

A sediment-sampling site was established at the Yellowstone River highway bridge crossing just downstream of Pine Creek. A wire-weight gage was installed on the bridge for measuring river stage, 1988 NAVD and 1983 NAD datums were established at the gage, and stage-discharge data were collected to begin developing a stage-discharge rating curve for the site. Suspended- and bed-sediment measurements were performed at the site between early May and late June of 1999. Approximately six samples were collected during that period for discharges ranging from approximately 3,600 cubic feet per second (cfs) to over 25,000 cfs. Laboratory analyses for the suspended sediment samples were completed and included determination of suspended sediment concentration and sand-silt break.

Future Work:
Over the 1999-2000 winter period, laboratory analyses of the bed-sediment samples will be performed. Field notes from the 1999 river cross-section survey work will be reduced and checked, and computer entry of the section data will be performed. Once contour maps are produced and become available to the USGS, river cross-section data will be incorporated with overbank ground-point information from the maps to completely describe each cross section. To confirm the validity of using topographically-derived overbank sections for flood mapping, overbank locations at selected cross sections will need to be surveyed and compared to ground-point data derived from the contour maps. Once verification is complete, development of the water-surface profile model can proceed.

Additional survey work will need to be performed in the spring of 2000. Most work will be in the reach from near Point of Rocks to Gardiner, with some additional work conducted in the reach already surveyed. With the completion of survey work to define a “low” and “high” flow profile, the remaining task to assist the BRD is to survey a “normal-flow” profile during the 2000 runoff period.

Sampling of suspended- and bed-sediment will continue and be completed during the 2000 runoff period. This information, along with other data, will be used to estimate relations between total sediment load and river discharge. In turn, the relations will provide needed information to assist in developing a calibrated

model for performing sediment-transport investigations.

Funding Status: This study is fully funded.

Riparian Trend Analysis

Title: Temporal Patterns of Channel Migration, Fluvial Events, and Associated Vegetation Along the Yellowstone River, Montana

Principal Investigators: Dr. Michael Merigliano (Riparian Ecologist)
University of Montana, School of Forestry
Missoula, Montana

Other Participants: Mary Louise Polzin

Goal: Determine relationship between fluvial geomorphic processes and flood plain vegetation.

Objectives:

1. Determine flood plain turnover rate and stratify by geomorphic setting. Incorporate Hydrogeomorphic Model (HGM) data and methods where appropriate.

2. Relate the magnitude and frequency of flow events to flood plain erosion and deposition (turnover) and associated cottonwood patches.

3. Incorporate the influence of ice drives on vegetation and flood plain dynamics.

4. Characterize the age distribution of the forest along the study area and cottonwood patches that comprise the forest.

5. Assess cottonwood longevity and limitations (that is, clearing, natural mortality, and flood plain erosion).

6. Create maps of channel migration history and existing flood plain vegetation.

7. Use information on historic changes and hydraulic and geomorphic factors to evaluate cumulative effects of bank stabilization projects.

Progress:
Reconnaissance fieldwork began in July 1999. The purpose of the first visits was to become familiar with the study area beyond maps and existing publications. Later work in September looked closely at vegetation types in the middle portion of the study area, followed by age mapping. So far, the age mapping revealed that tree stems are generally sound and datable. The age distribution of some patches is less even than usual. This has implications for flood-plain aging and management. The oldest trees on a distinct flood plain surface define the age of that surface. Some spread (say 5 years) in age is typical. There were some areas that had very disparate (at least 50 years) age differences in neighboring trees on what appeared to be a distinct surface of uniform age. An old fire followed by vegetative reproduction (sprouting) may have caused this.

Understory vegetation is sparser than expected based on similar rivers elsewhere. Livestock grazing and deer and elk use, especially in winter, may be limiting understory shrub cover. However, flood plain soils trend toward medium to course sands, and are not very cohesive, indicating low silt and clay content. Site factors (low summer precipitation, low water-holding capacity in the upper layers of the flood plain) may be limiting shrub cover too. We plan on using Hansen and other's 1995 classification of Montana's riparian and wetland sites to help describe the existing vegetation. However, observations reveal that

additional sampling and type descriptions will be needed to better-describe the vegetation. Characteristics important to the local wildlife of interest will also be incorporated where possible.

Observations to date indicate that ice drives are not an important force in channel and flood-plain formation.

Future Work:
We are just beginning, and the above are first impressions that will likely change. Tree aging will be a major part of the field data collection. I estimate that 1300 to 1500 trees will be needed to define the patterns on this flood plain. More may be needed depending on the extent and nature of stand structure. Reconstruction of historic vegetation will be based on aerial photography, land-based scenic photography, examination of less-grazed stands, soil analysis, and local experience (that is, long-term residents, land managers). Land based photography dates back to the 1870's. We will re-take these scenes for comparison purposes.

Although observations and local experience indicate that ice drives are not very important, we will not ignore the possibility of such influences on channel changes and vegetation.

Sample design is a primary task for this winter, so that all aging in the following two summers will be usable. Vegetation reconstruction efforts will probably be needed both summers. Flood plain mapping will be done in winter. Modeling will begin near the end of the second year. This effort will likely extend beyond Spring 2001, but some general knowledge of trends should be available before this time. We plan on interacting with the task force as the work progresses, so that our results are as understandable as possible and more meaningful for management purposes.

Funding Status: This study is partially funded, an additional $80,000 is still needed.

Fisheries Analysis

Title: Comparative Use of Modified and Natural Habitats of the Upper Yellowstone River by Juvenile Salmonids

Principal Investigators:
Dr. Alexander V. Zale, Montana Cooperative Fisheries Research Unit
US Geological Survey, Department of Biology
Montana State University
Bozeman, Montana

Thomas E. McMahon, Department of Biology
Montana State University
Bozeman, Montana

Other Participants:
Adam Craig, Graduate Research Assistant, Montana Cooperative Fisheries Research Unit
US Geological Survey, Department of Biology
Montana State University
Bozeman, Montana

Montana Department of Fish, Wildlife and Parks

Goal: Estimate to what extent bank stabilization, flow deflection, and flow confinement structures have changed aquatic habitat use by juvenile salmonids in the Yellowstone River.

Objectives:

1. Conduct a literature review and associated consultations of experts to summarize pertinent research and to guide the development of a sampling program using

appropriate capture methodologies to assess fish abundances in habitats of the Yellowstone River at appropriate times of the year.

2. Compare seasonal use of altered and analogous unaltered main-channel margins (bank habitats) by juvenile salmonids.

3. Assess juvenile fish use of lateral side channels to determine the effects of disconnecting them from the main channel.

Progress: Funding has been secured, project personnel have been selected, equipment is currently being ordered, and the literature review has been initiated.

Future Work:
The study will be completed in approximately two and a half years, by April 2002. Milestones are as follows:

1. Literature review completed by March 2000.
2. Sampling protocol and sites defined by April 2000.
3. Field work initiated in April 2000.
4. Interim Progress Report submitted in January 2001.
5. Final Report submitted in April 2002.

Funding Status: This study is partially funded; fish population work is funded and habitat modeling work is not funded.

Wildlife Analysis

The Wildlife Analysis proposal is still in a developmental stage. Ten thousand dollars has been secured to fund the literature review portion of the study.

Socio-economic Analysis

Much of the planning for the above-mentioned biophysical studies took shape in late1998 and early 1999. Once this research foot print was laid, the Task Force felt ready to begin examining the equally important, and highly complex human, or cultural, component of the study.

In early 1999, the Task Force began the process of hiring a coordinator whose main focus includes the development of a social and economic research strategy, which would meld with the other cumulative effect studies. The new coordinator, Liz Galli-Noble, began work in August and immediately took on this charge by incorporating the socio-economic assessment topic into meeting agendas and other outreach activities. Details from these sessions are outlined below:

Reintroducing the socio-economic topic—One useful approach to understanding and working with complex systems and issues is to break them into manageable pieces. In broad-scale project investigation and planning, a typical approach is to represent the study area's components in a separate, yet interrelated, manner. By viewing a project area in three dimensions—natural, social, and economic resources—individuals are better able to understand the diversity of the resource as well as the activities associated with that resource. It also helps investigators and decision makers to develop, compare, and select strategies that support all of their community's objectives, and not just a select few.

Given that the Task Force has already developed an information gathering process for the natural resource components of the upper Yellowstone River corridor, we are now broadening our focus to include the social and economic resource components of the system. An information gathering strategy is needed to aid the Task Force in developing a shared understanding of the issues, competing values, and uses that impact the upper Yellowstone River. In order to begin that process, several scoping methods were outlined and discussed at Task Force meetings: open group discussion, information checklist approach, reviewing three highly varied socio-economic assessments, and contracting with an

outside agency. Through these exercises, the Task Force began to recognize common cultural values and issues, and identified potential information gathering sources.

Social and economic stakeholders—The coordinator facilitated a meeting discussion where Task Force and community members were asked to identify the social and economic stakeholders in the Upper Yellowstone River Basin. As a start, the long list of groups and individuals illustrated in *Figure 3* (certainly not complete, nor in any order of importance) were identified and grouped by category. It was observed that many of the groups listed fell within both categories, further stressing the interrelatedness of social and economic issues. The Task Force was then asked to combine several scoping activities to determine if we had taken into account the needs and values of all of these stakeholders. It would be critical that the Task Force represent all members of the community.

Who are the social and economic stakeholders in the Upper Yellowstone River Basin?

- Landowners (agricultural, home owners, large ranches)
- Recreational Users (many types: fishing, rafting, kayaking, boating, etc.)
  Commercial v. Noncommercial
- Government
  Federal: US Army Corps of Engineers, National Park Service, US Forest Service, Bureau of Land Management
  State: State Lands, Department of Transportation
  Local: City, County
- Yellowstone National Park (watershed headwaters)
- Local Tourist Industry (bed & breakfast, hotels, motels, guest ranches)
- Entertainment Industry (film, advertising, TV)
- Natural Resource Industries (timber, mining, mineral)
- Cities and Local Communities
  Livingston, Gardiner, Pray, Emigrant, Springdale, etc.
- Special Interest Groups/Organizations (scientific, environmental, agricultural, historical, etc.)
- Road and Bridge (users, builders, neighbors)
- Spring Creeks (owners, users, fisheries)
- Tribal Governments
- Railroad
- Conservation Easements (buyers and sellers)
- Local Community Members (general public)
- County (Park)
- Contractors
- Fire Department/Emergency Services
- National and International Users

Figure 3. The following social and economic stakeholders in the Upper Yellowstone River Basin were identified by the Task Force.

Research partners–Much like the structure developed to address the biophysical components, experts are now being sought by the Task Force to outline a research design to investigate the social and economic resource components within the Upper Yellowstone River Study Area. These research partners will help the Task Force identify specific needs from this cultural assessment and clarify research abilities to deliver those products.

Several collaborations have already begun to take shape. Tim Bryggman, an economist with the Department of Natural Resources and Conservation, has offered to provide help with our economic research and analysis by (1) providing baseline information for Park County, (2) researching previously conducted economic studies that could be pertinent to our assessment, and (3) providing technical support to other social investigators and the Technical Advisory Committee.

Several departments at Montana State University (MSU) have also expressed interest in research partnerships with the Task Force. Departments with promising collaborative potential include: the Local Government Center, Extension Service, History Department, and the Geographic Information and Analysis Center.

Funding and time line–None of the funding for the socio-economic assessment of the upper Yellowstone River has been secured. Funding estimates to perform this study have ranged from $30,000 to $100,000. The Task Force coordinator is charged with securing these funds in the near future, after the scope of the assessment is formulated and approved by the Task Force. The socio-economic research time line should parallel the biophysical studies, falling within a similar two-year goal for data collection and analysis.

Funding Procurement

As is stated in Executive Orders 19-97 and 8-99 (see *Appendices A* and *B*) the Task Force is directed "... to seek or encourage others to seek grants, funds or other cooperative arrangements to implement recommendations of the Task Force… ." Similar to actions taken in 1998, the Task Force has actively pursued funding for our river corridor assessment in 1999. We have been successful in securing grants that fund the newly developed position of Task Force Coordinator, in addition to funding portions of the cumulative effects studies.

Table 1 summarizes our estimated project budget status to date (December 31, 1999). The table shows all costs associated with the primary components of our project, from initiation to recommendations development. Further, this summary table combines all project costs (funded and non-funded). Greater detail, including costs associated with individual research studies and outreach activities, may be reviewed in *Appendix C*.

Perhaps just as important as the monetary support that we have received, the Task Force has also benefited greatly from strong partnerships with a wide array of organizations and agencies. Many community members; local, state, and federal governmental agencies; and academics have generously donated technical support and assistance in each and every phase of project development and implementation. The $809,420 in-kind total shown in *Table 1* and *Table 2* (forty percent of our entire project budget) illustrates just how monumental these contributions have been and will continue to be for the Task Force. We have devoted an entire section, *Collaborations and Partnerships*, found later in this report to this very subject.

Finally, a series of tables, *Tables 3a, 3b,* and *3c*, focus on monetary funding for Task Force activities. These tables address secured, pending, and potential sources of funding, respectively. With an estimated funding shortfall of more than $600,000 (depending on final approval of studies still under consideration), it is crucial that parties and agencies interested in the health of the upper Yellowstone River step forward and assist in this effort. In addition, an essential function of the coordinator in 2000 will be tapping into these and other funding sources.

Table 1. Upper Yellowstone River Task Force Budget Summary

This table summarizes estimated costs associated with Task Force activities from inception to management recommendation development. The overall project involves two primary components: (1) Coordination/Education/Administration and (2) Baseline Data Acquisition.

Component / Task	**Funding Allocation**	**In-Kind Service Contribution**	**Total Estimated Cost**
	---------- Dollars ----------		
Coordination/Education/Administration[1]			
Park Conservation District Administration	41,024	0	41,024
Coordinate Baseline Studies	30,723	25,000	55,723
Communicate Baseline Results	38,671	21,500	60,171
Coordinate Public Involvement	38,671	31,500	70,171
Management Options Development	23,846	28,000	51,846
Management Recommendation Development	23,846	28,000	51,846
Administrative Services	62,519	10,000	72,519
Subtotal	259,300	144,000	403,300
Baseline Data Acquisition[2]			
Physical Features Inventory	26,000	4,000	30,000
Aerial Photography	21,000	3,000	24,000
Geomorphology and Historic Channel Changes	186,000	172,670	358,670
Hydraulic Analysis	168,250	168,250	336,500
Riparian/Wetlands/Land Use Mapping (NWI)	40,700	19,500	60,200
Riparian Trend Analysis	114,653	0	114,653
Fisheries Analysis	246,536	188,000	434,536
Wildlife Analysis	ι110,000	ι70,000	ι180,000
Socio-economic Analysis	ι75,000	ι10,000	ι85,000
Watershed Land Use Analysis	ι30,000	ι30,000	ι60,000
Subtotal	1,018,140	665,420	1,683,560
Total Task Force-Approved Project Costs	**1,062,440**	**699,420**	**1,761,860**
Total Estimated Project Costs	**1,277,440**	**809,420**	**2,086,860**

ι = proposed budget item; not approved by the Task Force to date (12/31/99); still in developmental stage.

[1] Budget projections for this component are based on a four-year project duration beginning July 1, 1999.

[2] Baseline data acquisition component initiated in 1999 and targeted for conclusion in December 31, 2001.

Table 2. Upper Yellowstone River Task Force In-Kind Service Contribution Budget
This table lists estimated contributions of personnel time spent in support of the Upper Yellowstone River Project to date (December 31, 1999).

Contributor	**Estimated Contribution (Dollars)**	Allocated Study/Activity
Upper Yellowstone River Task Force	30,000	Coordination/Education/Administration
	4,000	Physical Features Inventory
	10,000	Socio-economic Analysis
Task Force Technical Advisory Committee	14,000	Coordination/Education/Oversight
Park Conservation District	14,000	Coordination/Education/Administration
Montana Department of Environmental Quality	12,000	Coordination/Education/Administration
Montana Department of Natural Resources and Conservation	74,000	Coordination/Education/Administration
	3,000	Aerial Photography (ground control)
	172,670	Geomorphic Analysis
US Geological Survey, Water Resources	168,250	Hydraulic Analysis
US Geological Survey, Biological Resources	188,000	Fisheries Analysis
	70,000	Wildlife Analysis
US Fish & Wildlife Service	19,500	Riparian/Wetlands/Land Use Mapping
US Natural Resource Conservation Service	30,000	Watershed Land Use Analysis
Total Estimated In-Kind Contribution	**809,420**	

Table 3a. Upper Yellowstone River Task Force Secured Funding Summary.
This table illustrates: secured funding by source (grant allocation or agency), how much of that secured funding has been spent to date (December 31, 1999), and which activities/studies have signed contracts.

Source	Activity/Study	**Total Funding Allocated (Dollars)**	**Funding Spent (Dollars)**
Task Force Start-Up Grant Montana Department of Environmental Quality	Aerial Photography Task Force Administration	**50,000	16,321
Watershed Assistance Grant Montana Department of Natural Resources and Conservation	Coordination Initial Assessment	**2,100	2,100
HB 223 Conservation District Grant Montana Department of Natural Resources and Conservation	Aerial Photography	**10,000	10,000
Section 319 Water Quality Grant Montana Department of Environmental Quality	Task Force Coordinator	**40,000	12,200
Reclamation Development Grant Program (RDGP) 1999 Montana State Legislature		299,940	44,271
	Geomorphic Analysis (DNRC[1]) Hydraulic Analysis (USGS[2]) Riparian Trend Analysis (University of Montana) Task Force Project Coordination Task Force Scoping and Issue Identification Grant Administration (Park Conservation District)	**49,700 **168,250 **35,490 **10,000 **12,500 **24,000	
US Army Corps of Engineers (Fiscal Year 1999 Budget Allocation)		372,000	222,377
	Physical Features Inventory Digitization (NRCS/NRIS[3]) Demo Mapping – Brisbin Quadrangle (USFWS[4]) Hydrology Start-Up (USGS) Riparian/Wetlands/Land Use Mapping (USCOE[5]/USFWS) Fisheries Analysis Digital Ortho-Photos (USFS[6]) Personnel Labor and Travel (USCOE)	25,700 3,457 6,500 9,620 97,536 32,000 47,564	
US Fish and Wildlife Service Quick Response Funding Program	Literature Search and Species Prioritization (USGS)	**10,000	10,000

** = Contracted
[1] DNRC = Montana Department of Natural Resources and Conservation
[2] USGS = United States Geological Survey
[3] NRCS/NRIS = United States Natural Resource Conservation Service/Natural Resource Information Service
[4] USFWS = United States Fish and Wildlife Service
[5] USCOE = United States Army Corps of Engineers
[6] USFS = United States Forest Service

Table 3b. Pending Sources of Funding
This table illustrates sources of funding that are pending at the end of 1999.

Source	Activity/Study	Total Funding Requested (Dollars)
Section 319 Water Quality Grant Montana Department of Environmental Quality	Task Force Coordinator and Office	172,800 (3 years funding)
Environmental Systems Research Institute (ESRI) Local Government Start-up Grant Program	GIS Software, Arc View	7,500 (estimated)

Table 3c. Potential Funding Sources for 2000.
This table illustrates potential funding sources that the Task Force may pursue in 2000.

Source	Activity/Study	Funding Needed or Available (Dollars)
Section 22, Planning Assistance to States Program US Army Corps of Engineers	Non-funded technical studies: riparian, socio-economic, fisheries, and/or wildlife. Ortho-photo mapping (1:6000 and 1:8000).	175,000 or more 105,000
Montana Department of Transportation Research Program	Non-funded technical studies: socio-economic.	5,000 to 75,000
Bonneville Environmental Foundation Independent, tax-exempt public foundation	Non-funded technical studies: riparian, socio-economic, fisheries, and/or wildlife.	5,000 to 25,000
Rural Community Assistance US Forest Service	Non-funded technical studies: socio-economic. Outreach and Education.	1,000 to 20,000
Montana Water Resources Grants US Geological Survey 104(B) Competitive Research Grants	Non-funded technical studies: riparian, socio-economic, fisheries, and/or wildlife.	5,000 to 20,000
Sustainable Development Challenge Grant US Environmental Protection Agency	Non-funded technical studies: riparian, socio-economic, fisheries, and/or wildlife.	Unknown
Environmental Monitoring for Public Access and Community Tracking, US Environmental Protection Agency	Non-funded technical studies: riparian, socio-economic, fisheries, and/or wildlife. Outreach and Education.	Unknown
Environmental Education Grants Program US Environmental Protection Agency	Non-funded technical studies: socio-economic. Outreach and Education.	5,000 to 50,000

Collaboration and Partnerships

Partnerships and In-Kind Contributions

Just as the multitude of actions taken in the wake of the 1996/1997 floods helped many Montanans to realize the need for a more comprehensive planning effort involving citizens and communities, the Task Force has also recognized a need to consolidate research efforts along the Yellowstone River. The make up of the Task Force is testament to the power of seating concerned citizens groups and governmental agencies as collaborative investigators and decision makers. Having many of the interested parties and agencies charged with regulation of river resources represented on the Task Force, has streamlined much of our research effort thus far. The significant in-kind contributions made by partner agencies within the Task Force structure are illustrated in *Tables 1* and *2*. Additional examples that further demonstrate these positive and efficient partnerships include:

US Army Corps of Engineers (Corps)—As a result of a request from the Montana congressional delegation, Congress directed $320,000 in expenditures for the US Army Corps of Engineers to develop a Special Area Management Plan (SAMP) for the upper Yellowstone River. Specific language within the appropriations stated that as part of the SAMP, the Corps will assess the long-term effects of bank stabilization, fully coordinate with the Task Force, and potentially conclude the process with a general permit.

Because their activities in the upper reaches of the river complements the Task Force's goals and objectives, the Corps was appointed as a ex-officio member of the Task Force, and they have been an active research and funding partner for the past two years. Their investment and support of this effort is long term. In addition to supporting the Task Force and serving as a cooperating agency for federal/state technical studies, the Corps has provided funding for the following activities:

Digitization of the Physical Features Inventory (NRCS/NRIS)
Hydrology Analysis, initial reconnaissance work (USGS)
Natural Resources Inventory (USFWS)
Fisheries Analysis (MSU Cooperative Fisheries Unit)
1:24,000 digital ortho-photo map production (USFS-Missoula)

USDA Natural Resources Conservation Service (NRCS)—Partially funded by the NRCS, the *Yellowstone River Physical Features Inventory–Gardiner to Springdale* was conducted as a first step in understanding cause and effect relationships in the Upper Yellowstone River Basin. The 1998 study was a collaborative effort by the Task Force, DEQ, NRCS, and other local volunteers. Both in paper form and now on the internet, it is the first informational product that the Task Force has been able to share with the public, and the results of this inventory have served as a prioritization tool to guide further data acquisition and analysis efforts.

Another contribution that the NRCS has provided is office space and furniture for our new Task Force office in the USDA Building at 5242 Highway 89 South in Livingston, Montana. This is an ideal location for the Task Force Coordinator to be housed because it promotes interaction with the public, and state and federal agencies, as well as providing access to technical materials and support.

Finally, a Watershed Land Use Analysis proposal, written and partially funded by the NRCS, has been completed and reviewed by the Technical Advisory Committee. If approved by the Task Force, this study will be a vital component of the upper Yellowstone River corridor assessment.

Montana Department of Environmental Quality (DEQ)—The DEQ has contributed to the Task Force effort since its inception in 1997. A DEQ representative sits on the Task Force as an ex-officio member, and DEQ staff provides technical support as a major in-kind contribution to the project. In addition, the DEQ has been an invaluable source of funding for the Task Force through varied avenues: (1) a Start-up Grant of $50,000, (2) a 319 Grant of $40,000 to support our new coordinator position, and (3) potentially, a second 319 Grant to provide continued funding for the coordinator and development of management recommendations.

Montana Department of Natural Resources and Conservation (DNRC)—DNRC has played an integral support role to the Task Force effort from the beginning. In addition to providing an ex-officio representative, DNRC has provided direct administrative and technical assistance in the form coordination services and funding proposal preparation. DNRC also staffs two positions on the Task Force's Technical Advisory Committee and is providing

approximately $172,670 in in-kind services for the geomorphology component of the cumulative effects investigation. In addition, the Task Force was a recipient of a $299,940 grant from the Reclamation and Development Grants Program administered by DNRC's Resource Development Bureau for the baseline data component of the cumulative effects investigation.

Montana Department of Transportation (MDT)— An MDT representative sits on the Task Force as an ex-officio member. The MDT provided funding for the1998 photos used in the Physical Features Inventory.

Park Conservation District (PCD)—The Task Force is housed within the Park Conservation District office. The PCD functions as the administrative support for the Task Force. All of our grants and contracting are sponsored by and processed through the PCD. Our new Task Force coordinator position was established through the PCD structure, and the PCD Board co-supervises her position. A PCD representative sits on the Task Force as a voting member and reports back to his Board on Task Force activities.

As our project goals mature and expand, the Task Force has become aware of other potential research and educational partnerships. Numerous other agencies and organizations are doing highly-focused and limited-scope research throughout the Upper Yellowstone River Basin. Since our broad-based assessment of the river corridor could simply be duplicating some of these efforts, we will continue to seek opportunities to collaborate with appropriate, scientifically-sound studies—either by incorporating their findings into our investigation, or by building on their results and performing our own subsequent studies based those results.

Related Investigations

The Governor's budget for the State of Montana for fiscal years 2000-2001 recommended funding from the Reclamation and Development Grants Program (RDGP) for purposes of conducting the "*Upper Yellowstone River Cumulative Effects Investigation.*" Subsequently, the 1999 Montana State Legislature awarded a grant in the amount of $299,940 to the Park Conservation District, on behalf of the Task Force, to conduct the investigation. The Governor's funding recommendation stipulated submittal of a status report on other studies affecting the upper Yellowstone River. The stipulation was intended to address concern that the US Army Corps of Engineers and/or other federal agencies would undertake a study similar to the cumulative effects investigation sponsored by the RDG Program.

Subsequent to the grant from the Legislature, Congress directed $320,000 in expenditures for the US Army Corps of Engineers to develop a Special Area Management Plan for the upper Yellowstone River. Specific language within the federal appropriations bill stated that as part of the Plan's development, the Corps will "…*fully coordinate with the Task Force*…", and conclude the process with a general permit. Since these early stages of the overall project, the Corps and other state and federal agencies have worked cooperatively to design and implement a coordinated cumulative effects investigation regarding channel and floodplain modification. In doing so, they have recognized the Task Force's oversight role in developing a unified approach to understanding river channel problems and solutions.

Other than those endorsed by the Task Force, there are no other studies or investigations (either underway or proposed) that are specifically intended to provide the information necessary to make informed river corridor management recommendations. There are, however, other studies underway that include the Upper Yellowstone River Basin within their study area; examples are:

- National Water Quality Assessment (NAWQA) Program The Yellowstone River Basin is one of a set of NAWQA studies started in 1997 by the US Geological Survey. Planning, study design, and analysis of existing data occurred in 1997 and 1998. Starting in 1999, ground-water, surface-water, and biological data will be collected intensively for three years, a period referred to as the high intensity phase. A low-intensity phase follows for six years, during which time water quality will be monitored at selected sites and areas assessed during the high-intensity phase. This cycle (without the planning phase) will be repeated starting in 2007. This combination of high- and low-intensity monitoring phases allows examination of trends in water quality over time.

- Remote Sensing Study Funded by the US Environmental Protection Agency and conducted by Yellowstone Ecosystems Studies, this $900,000, multi-year study is designed to use remote sensing to measure indicators of riparian and steam "health" to gauge overall watershed health.

- Montana Natural Heritage Program (MNHP) Beginning in 1997 and now in its final phase, the Wyoming and Montana Natural Heritage Programs began assembling information on biodiversity features (rare and sensitive species and outstanding natural communities) in the Upper Yellowstone Watershed (above the Big Horn confluence). This information was reviewed for reliability and coverage, and data gaps and validation needs were identified. The information is being summarized, key species and locations identified, and ecologically significant sites mapped.

  In addition, in 1999, the MNHP began surveying and documenting outstanding and high-quality wetlands in the Upper Yellowstone Watershed. Modeled after wetland surveys done in the Flathead Watershed, Upper Yellowstone sites are rated for "ecological significance"—types of wetland plant communities present, their quality and condition, presence of rare or sensitive species, and condition of surrounding landscape in relation to wetland integrity. Both projects are scheduled for completion in spring of 2001.

  Thirty-five percent of MNHP's funding comes from legislature-appropriated state sources, and the remainder is raised through grants, contracts, and cooperative agreements with agencies and organizations.

While the information gained by the above-listed studies may augment the scientific investigation instigated by the Task Force, none of these other studies duplicate our effort. All technical work endorsed by the Task Force is reviewed and approved by its Technical Advisory Committee, which has broad knowledge and ongoing involvement in research undertaken throughout the Yellowstone River Basin.

In addition to monies awarded through the Reclamation and Development Grants Program, the various components of the Upper Yellowstone Cumulative Effects Investigation are funded from a variety of sources (see *Funding Procurement*). Most funding has or will be obtained through competitive application processes that ensure scrutiny of technical work plans and minimize the likelihood of duplication.

Coordinator Activities, Outreach, and Education

Task Force Coordinator—After extensive discussion, the Task Force decided to hire a full-time coordinator in April 1999. Two subcommittees of Task Force members were appointed to streamline this effort: the Acquisition of Coordinator Services Subcommittee and the Coordinator Review Subcommittee. The five-member Acquisition subcommittee worked for approximately two months to define the coordinator position (preferred knowledge, skills, abilities, and work duties). The subsequent, seven-member Review subcommittee then spent an additional two months advertising the position, reviewing applications, and interviewing applicants. Two candidates were chosen through this process and were presented to the Task Force at our August 3, 1999 meeting. The final selection was then made by the full Task Force after that same meeting.

The new coordinator, Liz Galli-Noble, began working on August 16, 1999. Having spent half of 1999 focusing on hiring a coordinator, establishing a Technical Advisory Committee, and developing the framework to conduct the biophysical assessment, the Task Force instructed Liz to resume much-needed public outreach and education, and to promote those activities in conjunction with ongoing studies. Several tasks that the coordinator has under taken since then are outlined below.

Landowner permission project—Because the vast majority of land adjoining the upper Yellowstone River is privately owned, the Task Force takes very seriously the need to inform the public of our investigations and actions along the river. As we developed the river corridor assessment strategy, it became apparent that much of our research would be performed on private property. Therefore, Task Force staff began researching ownership and contacting any and all private landowners who may be affected by our spring, summer, and fall 1999 data collection efforts. Landowners were sent letters informing them of our plans, and many were phoned or visited in person to secure permission to cross their properties. In addition, this communication was also used as a community outreach effort by allowing landowners the opportunity to ask questions about our research activities, or comment on our river corridor effort. Public feedback was recorded by coordinator and will be compiled in a report to the Task Force at the end of our research phase.

Present and future workshops— During 1998, the Task Force sponsored two public workshops and two educational field trips. Hoping to build on that success, a blueprint for public involvement workshops was outlined at the April 15, 1999 meeting. We reiterated our outreach objectives as two-fold, to provide a forum for discussion of issues and feedback from community members, and to develop a shared understanding of river system through education. As a result, two workshop strategies were developed: (1) subject-driven workshops with varied expert lecturers, and (2) public supported/feedback workshops in differing valley communities.

Subject-driven workshops would provide a platform for invited guest speakers to share their knowledge, experiences, and research of issues of particular interest to Task Force members and the public. On the other hand, direct outreach workshops would allow us to have discussions with members of local communities spread over an 80-mile reach of upper Yellowstone River. These community-focused workshops would allow individuals to define their concerns for the river and to disclose the values that they consider important. They would also characterize sections of the river that are of concern to the public. Selection of workshop topics and locations will be addressed in early 2000.

Outreach to the schools—Reaching out to the youth of our community and interacting with local school children is an important component of our educational outreach. We hope that by communicating the Task Force purpose to them and educating them about our studies and eventually research results, they will become partners in this vital river corridor effort. Because our charge from the Governor—to preserve the integrity, beauty, values, and function of the upper Yellowstone River for many generations to come—directly impacts these children, we will continue to strive to include the community's youth in all aspects of our assessment.

In collaboration with the Park Conservation District, the Task Force coordinator visited five seventh-grade classes at the Sleeping Giant Middle School in December 1999. The presentation theme for the day was "water" and water-based science and research projects. The coordinator provided background information about the Task Force and described how our research focuses on water (the Yellowstone River corridor). This was then linked to the topics of the water cycle and potential water-based science projects that the students could do as

part of their January/February work assignment. The coordinator stressed over and over the fact that a great deal of information and helpful materials are housed at the Task Force office, and that the Task Force hopes that the students and their parents will get involved in our effort to assess the upper Yellowstone River.

Looking Ahead to 2000

1999 has been a very productive year for the Task Force. As a group, we have moved from a trust- and cohesion-building phase to a coordinated action and data acquisition phase. We have built many strong and productive partnerships with state and federal agencies and within our local community. We plan to continue actively pursuing these dynamic collaborations with all interested parties and promoting interaction with the public, whenever possible.

Our Cumulative Effects Study of the upper Yellowstone River is well underway with several of the biophysical investigations approved, funded, and research work beginning. Studies still under consideration or not funded will now become our priority for early 2000.

The Task Force is hopeful that—with the great dedication of our project partners, and the time and energy that our new coordinator will be able to devote to this effort—we will have our research needs online and funded in the near future. However, given an estimated funding shortfall of more than $600,000, it is crucial that parties and agencies interested in the health of the upper Yellowstone River step forward now and assist in this effort.

Once all of the studies are progressing, the Task Force plans to focus a great deal of our energy on public outreach and education. Our outreach objectives are two-fold: to provide a forum for discussion of issues and feedback from community members, and to develop a shared understanding of river system through education. In addition to our monthly meetings, the Task Force plans to begin a series of workshops to promote more interaction with the public, as well as to learn along side them. We recognize the need to have the public actively involved in all phases of our effort, and that public support and input will help us address our community's values, needs, and concerns for the Yellowstone River. We are also confident that letting the science lead us through this river corridor assessment is the right path to take, and will establish a sound base to formulate our recommendations to Montana's Governor.

Appendices

Appendix A. Governor's Executive Order No. 19-97

State of Montana
Office of the Governor

Executive Order No. 19-97

EXECUTIVE ORDER ESTABLISHING THE
GOVERNOR'S UPPER YELLOWSTONE RIVER TASK FORCE

WHEREAS, the upper Yellowstone River and its tributaries, herein defined as that reach of the river (including tributaries) beginning at the Yellowstone Park boundary and extending downstream to the bridge crossing the river at Springdale, is a national treasure; and

WHEREAS, the recreational opportunities provided by the river provide significant contributions to Montana's economy; and

WHEREAS, the river is essential to Montanans who live along it, providing water for agricultural, domestic and commercial purposes; and

WHEREAS, the extreme floods of 1996 and 1997 have created hardships for communities and Montana citizens who live adjacent to the river, causing damage to property and stream banks, as well as some nationally-renowned spring creeks in Paradise Valley; and

WHEREAS, previous decades of work done along the river for purposes of flood control, construction of transportation

corridors and other purposes have altered the natural flood plain of the river, with the potential to exacerbate damage to private and public property and fish habitat; and

WHEREAS, there is a need for a more comprehensive planning effort involving citizens, communities, and government agencies that have an interest in the upper Yellowstone River to ensure that future projects that affect the river are planned and conducted in a manner that will preserve the integrity, beauty, values, and function of the upper Yellowstone River for Montanans now and in the future.

NOW THEREFORE, I, MARC RACICOT, Governor of the State of Montana, by virtue of the authority vested in me, do hereby establish the Upper Yellowstone River Task Force.

I. PURPOSE

A. The Upper Yellowstone River Task Force shall:

1. Provide a forum for the discussion of issues that effect the Upper Yellowstone River basin, particularly, to bring together landowners, sportsmen and sportswomen, and community leaders to develop a shared understanding of the issues and competing values and uses that impact the Upper Yellowstone River;

2. meet on a regular basis, the frequency to be determined by Task Force members, for the purpose of encouraging a comprehensive approach to action taken along the Yellowstone River to ensure that its integrity remains intact while balancing the needs of communities and landowners to protect property;

3. seek or encourage others to seek grants, funds or other cooperative arrangements to implement recommendations of the Task Force; and

4. prepare an annual report to the Governor on the progress of the task force.

II. COMPOSITION

The Upper Yellowstone River Task Force shall be composed of no more than 12 voting members including representatives of the following: local businesses, property owners, farmers and ranchers who live along the river, the angling community, a conservation group or groups, Park County, the City of Livingston and the local Conservation District. Representatives of the Army Corps of Engineers, Departments of Natural Resources and Conservation, Environmental Quality, Fish, Wildlife & Parks, and Transportation shall serve as ex-officio members.

III. DURATION

This Task Force shall remain in existence until July 1, 1999 unless extended or terminated by subsequent Executive Order.

This Order is effective immediately.

GIVEN under my hand and the GREAT SEAL of the State of Montana, this 5th day of November, 1997.

MARC RACICOT, Governor

ATTEST:

MIKE COONEY, Secretary of State

Appendix B. Governor's Executive Order No. 8-99

State of Montana
Office of the Governor

Executive Order No. 8-99

EXECUTIVE ORDER CONTINUING THE
GOVERNOR'S UPPER YELLOWSTONE RIVER TASK FORCE

WHEREAS, the upper Yellowstone River and its tributaries, herein defined as that reach of the river (including tributaries) beginning at the Yellowstone Park boundary and extending downstream to the bridge crossing the river at Springdale, is a national treasure; and

WHEREAS, the recreational opportunities provided by the river provide significant contributions to Montana's economy; and

WHEREAS, the river is essential to Montanans who live along it, providing water for agricultural, domestic and commercial purposes; and

WHEREAS, the extreme floods of 1996 and 1997 created hardships for communities and Montana citizens who live adjacent to the river, causing damage to property and stream banks, as well as some nationally-renowned spring creeks in Paradise Valley; and

WHEREAS, previous decades of work done along the river for

purposes of flood control, construction of transportation corridors and other purposes have altered the natural flood plain of the river, with the potential to exacerbate damage to private and public property and fish habitat; and

WHEREAS, there is a need for a more comprehensive planning effort involving citizens, communities, and government agencies that have an interest in the upper Yellowstone River to ensure that future projects that affect the river are planned and conducted in a manner that will preserve the integrity, beauty, values, and function of the upper Yellowstone River for Montanans now and in the future.

NOW THEREFORE, I, MARC RACICOT, Governor of the State of Montana, by virtue of the authority vested in me, do hereby continue the Upper Yellowstone River Task Force.

I. PURPOSE

A. The Upper Yellowstone River Task Force shall:

1. Provide a forum for the discussion of issues that effect the Upper Yellowstone River basin, particularly, to bring together landowners, sportsmen and sportswomen, and community leaders to develop a shared understanding of the issues and competing values and uses that impact the Upper Yellowstone River;

2. meet on a regular basis, the frequency to be determined by Task Force members, for the purpose of

encouraging a comprehensive approach to action taken along the Yellowstone River to ensure that its integrity remains intact while balancing the needs of communities and landowners to protect property;

3. seek or encourage others to seek grants, funds or other cooperative arrangements to implement recommendations of the Task Force; and

4. prepare an annual report to the Governor on the progress of the task force.

II. COMPOSITION

The Upper Yellowstone River Task Force shall be composed of no more than 12 voting members including representatives of the following: local businesses, property owners, farmers and ranchers who live along the river, the angling community, a conservation group or groups, Park County, the City of Livingston and the local Conservation District. Representatives of the Army Corps of Engineers, Departments of Natural Resources and Conservation, Environmental Quality, Fish, Wildlife & Parks, and Transportation shall serve as ex-officio members.

III. DURATION

This Task Force shall remain in existence for two years from the date of effect unless extended or terminated

by subsequent Executive Order.

This Order is effective immediately.

GIVEN under my hand and the GREAT SEAL of the State of Montana, this 28th day of June, 1999.

MARC RACICOT, Governor

ATTEST:

MIKE COONEY, Secretary of State

Appendix C. 1999 Budget Summary Tables

Table 1C. Upper Yellowstone River Task Force Budget Summary
See subsequent *Table 2C* for details for individual line items.

Component / Task	Costs and Appropriated Funding (Dollars)			
	RDGP[1] Grant	In-Kind Services	Other Funding Sources	Total
Coordination/Education/Administration				
Park Conservation District Administration	24,000	0	17,024	41,024
Task Force Scoping / Issue Identification	12,500	0	36,800	49,300
Project Coordination / Pubic Involvement	10,000	144,000	158,976	312,976
Subtotal	46,500	144,000	212,800	403,300
Baseline Data Acquisition				
Physical Features Inventory	0	4,000	26,000	30,000
Aerial Photography	0	3,000	21,000	24,000
Geomorphology and Historic Channel Changes	49,000	172,670	137,000	358,670
Hydraulic Analysis	168,250	168,250	0	336,500
Riparian/Wetlands/Land Use Mapping (NWI[2])	0	19,500	40,700	60,200
Riparian Trend Analysis	35,490	0	79,163	114,653
Fisheries Analysis	0	188,000	246,536	434,536
Wildlife Analysis	0	70,000	110,000	180,000
Socio-economic Analysis	0	10,000	75,000	85,000
Watershed Land Use Analysis	0	30,000	30,000	60,000
Subtotal	252,740	665,420	765,399	1,683,559
Estimated Total Costs	**299,240**	**809,420**	**978,199**	**2,086,860**

Non-funded costs[3]: $172, 800 Coordination Component
508,163 Data Acquisition Component
$600,963 **Total estimated non-funded costs**

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[1] RDGP = Reclamation and Development Grant Program.
[2] NWI = National Wetland Inventory.
[3] See *Table 2C* for detailed breakdown of non-funded costs.

Table 2C. Upper Yellowstone River Task Force Detailed Summary Budget

This budget summary table provides greater detail than the previous *Table 1C*. Task Force actions are shown as they relate to overall project components, and then further described by individual tasks performed for specific studies or activities. Grant and other funding sources, in-kind contributions, contractors, and project status to date (December 31, 1999) are also outlined for each activity. Note: column headings change between the Coordination and Data Acquisition Components, due to shift in their major funding sources.

Component / Task / Action	Costs and Appropriated Funding (Dollars)					Contractor / Project Status
	RDGP[1] Grant	In-Kind Services	319 Grant[2] FY[3] 2000	319 Grant FY 2001	Total	
Coordination/Education/Administration						
Park Conservation District Administration	24,000	0	3,200	*13,824	41,024	Park Conservation District /
Subtotal	24,000	0	3,200	*13,824	41,024	Administration Fees @ 8 %
Project Coordination / Pubic Involvement						
Coordinate Technical Studies	5,625	25,000	9,200	*15,898	55,723	Task Force / Ongoing
Communicate Technical Results	5,625	21,500	9,200	*23,846	60,171	Task Force / Ongoing
Coordinate Public Involvement	5,625	31,500	9,200	*23,846	70,171	Task Force / Ongoing
Develop Management Options	0	28,000	0	*23,846	51,846	Task Force / Future
Develop Management Recommendations	0	28,000	0	*23,846	51,846	Task Force / Future
Perform Administration Services	5,625	10,000	9,200	*47,694	72,519	Task Force / Ongoing
Subtotal	22,500	144,000	36,800	158,976	362,276	
Component Total	**46,500**	**144,000**	**40,000**	**172,800**	**403,300**	

[1] RDGP = DNRC Reclamation and Development Grant Program
[2] 319 = Department of Environmental Quality 319 Grant
[3] FY = Fiscal Year
* = Non-funded activity, as of 12/31/99.
Pending = pending receipt of data.

Acronym Key:
BRD = Biological Resource Division
DNRC = Montana Department of Natural Resources and Conservation
NRCS = United States Natural Resource Conservation Service
NRIS = Natural Resource Information Service
TF = Upper Yellowstone River Task Force
U of M = University of Montana at Missoula
USCOE = United States Army Corps of Engineers
USFS = United States Forest Service
USFWS = United States Fish and Wildlife Service
USGS = United States Geological Survey

Component / Task / Activity		Costs and Appropriated Funding (Dollars)					Contractor / Project Status
		RDGP[1] Grant	In-Kind Services	USCOE Funding	Other Funding Sources	Total	
Baseline Data Acquisition							
Physical Features Inventory							
Field Work		0	4,000	0	0	4,000	Task Force / Completed
Digitization		0	0	26,000	0	26,000	NRIS, NRCS / Completed
	Subtotal	0	4,000	26,000	0	30,000	
Aerial Photography							
Field Work (Ground control)		0	3,000	0	0	3,000	DNRC / Completed
1:6000, 1:8000, 1:24000 Acquisition		0	0	21,000	0	21,000	USFS / Completed
	Subtotal	0	3,000	21,000	0	24,000	
Geomorphology and Historic Channel Changes							
River Channel and Floodplain Map		4,000	10,600	0	0	14,600	DNRC / Underway
1:24000 ortho-photos		0	0	32,000	0	32,000	USFS / Underway
1:6000, 1:8000, Historic Photos		0	0	0	*105,000	*105,000	USFS / Lack of Funding
Geomorphic Channel Classification		20,000	46,330	0	0	66,330	DNRC / Underway
Map and Analyze Channel Changes		20,000	57,040	0	0	77,040	DNRC / Pending
Channel Stability and Cumulative Effects		5,000	58,700	0	0	63,700	DNRC / Pending
	Subtotal	49,000	172,670	32,000	*105,000	358,670	
Hydraulic Analysis							
Channel Geometry Survey		60,485	60,485	0	0	120,970	USFS / Underway
Water Profile Analysis		44,980	44,980	0	0	89,960	USGS / Pending
Floodplain Delineation		50,285	50,285	0	0	100,570	USGS / Pending
Sediment Data		12,500	12,500	0	0	25,000	USGS / Pending
	Subtotal	168,250	168,250	0	0	336,500	
Riparian/Wetlands/Land Use Mapping							
Photo Acquisition (color infrared 1:24,000)		0	0	20,700	0	20,700	USCOE / Completed
Photo Interpretation		0	19,500	0	0	19,500	USFWS / Underway
Digitization		0	0	20,000	0	20,000	USFWS / Underway
	Subtotal	0	19,500	40,700	0	60,200	

Component / Task / Activity	Costs and Appropriated Funding (Dollars)					Contractor / Project Status
	RDGP[1] Grant	In-Kind Services	USCOE Funding	Other Funding Sources	Total	
Riparian Trend Analysis						
Determine Floodplain Turnover	25,490	0	0	*46,831	72,321	U of M / Underway
Flow Events/Cottonwood Turnover	0	0	0	*1,031	1,031	U of M / Lack of Funding
Influence of Ice Drives on Vegetation	0	0	0	*1,442	1,442	U of M / Lack of Funding
Characterize Vegetation Age Distribution	0	0	0	*1,854	1,854	U of M / Lack of Funding
Assess Cottonwood Longevity	0	0	0	*1,442	1,442	U of M / Lack of Funding
Prepare Channel Migration Maps	0	0	0	*824	824	U of M / Lack of Funding
Evaluate Cumulative Effects	0	0	0	*7,006	7,006	U of M / Lack of Funding
Contingencies, Travel, Writing	10,000	0	0	*18,735	28,735	U of M / Underway
Subtotal	35,490	0	0	79,165	114,653	
Fisheries Analysis						
Population Estimates	0	15,000	97,536	0	112,536	USGS-BRD / Underway
Physical Habitat Modeling						
Phase I (PHABSIM)	0	38,000	0	*58,000	96,000	USGS-BRD / Lack of Funding
Phase II	0	135,000	0	*91,000	226,000	USGS-BRD / Lack of Funding
Subtotal	0	188,000	97,536	149,000	434,536	
Wildlife Analysis						
Data Compilation—Species of Concern	0	20,000	0	10,000	30,000	USGS-BRD / Underway
Population Sampling—Trend Projection	0	50,000	0	*100,000	150,000	USGS-BRD / Lack of Funding
Subtotal	0	70,000	0	110,000	180,000	
Socio-economic Analysis						
Economic Data Compilation	0	4,000	0	0	4,000	DNRC / Underway
Scoping / Issue Development	0	3,000	0	0	3,000	Task Force / Underway
Characterize Human Community	0	3,000	0	75,000	78,000	Lack of Funding
Subtotal	0	10,000	0	75,000	85,000	
Watershed Land Use Analysis	0	*30,000	0	*30,000	*60,000	NRCS & Others / Lack of Funding
Subtotal	0	30,000	0	30,000	60,000	
Component Total	**252,740**	**665,420**	**217,236**	**548,165**	**1,683,561**	
All Components Grand Total	**299,240**	**809,420**	**257,236**	**720,963**	**2,086,860**	

[1] RDGP = DNRC Reclamation and Development Grant Program
[2] 319 = Department of Environmental Quality 319 Grant
[3] FY = Fiscal Year
* = Non-funded activity, as of 12/31/99.
Pending = pending receipt of data.

Acronym Key:

BRD = Biological Resource Division
DNRC = Montana Department of Natural Resources and Conservation
NRCS = United States Natural Resource Conservation Service
NRIS = Natural Resource Information Service
TF = Governor's Upper Yellowstone River Task Force
U of M = University of Montana at Missoula
USCOE = United States Army Corps of Engineers
USFS = United States Forest Service
USFWS = United States Fish and Wildlife Service
USGS = United States Geological Survey

Appendix D. Upper Yellowstone River Task Force Ground Rules

Revised: October 19, 1999

Upper Yellowstone River Task Force
Ground Rules
1999 – 2001 Term

Participation

1. The discussions of the Upper Yellowstone River Task Force will include the perspectives of individuals and organizations whose interests may be affected by the recommendations or activities of the Task Force.

   Voting Task Force members represent the following interests:

   - Local businesses
   - Property owners
   - Ranchers
   - Angling community
   - Conservation groups
   - Park County
   - City of Livingston
   - Park Conservation District

   Ex-officio members of the Task Force represent the following government agencies:

   - Montana Department of Environmental Quality
   - Montana Department of Fish, Wildlife and Parks
   - Montana Department of Natural Resources and Conservation
   - Montana Department of Transportation
   - U.S. Army Corps of Engineers
   - National Park Service—Yellowstone National Park
   - U.S. Forest Service—Livingston Ranger District
   - U.S. Forest Service—Gardiner Ranger District

The Task Force will actively encourage the inclusion of a variety of perspectives in the following ways:

a) Members will candidly identify and share their values and interests and will do so as soon as possible.

b) Members will inform their constituency of the activities of the Task Force, seek the advice of their constituency and make every effort to speak for their constituency.

c) The Task Force will invite individuals with perspective not represented by members to discuss their views with the task Force.

d) Task Force meetings will be open to the public. Individuals may request time on the Task Force agenda to discuss their concerns.

e) Notice of meetings will be provided to the news media.

f) A mailing list will be established and, upon request, individuals will receive notices of upcoming meetings and summaries of previous meetings.

g) The Task Force will hold special meetings at different locations, when needed, to share information and gather ideas, comments and concerns about Task Force proposals.

h) The Task Force will periodically prepare a summary of its activities **and distribute this summary to the news media and individuals on the mailing list.**

2. Task Force members agree to make every effort to attend every meeting. If a member is unable to attend a meeting, he or she may make arrangements for an alternate to attend the meeting, but should ensure that the alternate is fully informed of the issues under consideration and progress to date.

Decisions/Agreements

1. The Task Force will seek consensus agreements regarding policy decisions and recommendations. Consensus is defined as acceptance of an agreement. Members may not agree with all aspects of an agreement; however, they do not disagree enough to warrant opposition to the agreement. When Task force members accept an agreement, they commit themselves to implementing the agreement.

2. Participants who disagree with a proposal are responsible for offering a constructive alternative that seeks to accommodate the interests of all other participants.

3. Business or monetary decisions may be made by a voice vote of a majority (seven voting members) of the Task Force. The Chair may vote.

Communication with the Media

1. The Chair will be the spokesperson for the Task Force in communications with the media.

2. Each participant is free to speak to the media regarding their own view on the work of the Task Force. No participant may characterize the views of other participants expressed in this process to the media or in other forums.

3. With the exception of notices of meetings or events, written statements distributed to the news media will be reviewed by the Task Force.

Roles and Responsibilities

1. The Task Force Chair, will serve as the contact person for the Task Force and liaison with government agencies. The Chair, with the consent of the Task Force, is responsible for conducting and calling meetings, clarifying voting issues and appointing subcommittees, and providing direction to the Task Force Coordinator.

2. The Vice-Chair will assume the duties of the Chair in his absence.

3. The Coordinator will: help the participants design an appropriate process; coordinate pre- and post-meeting logistics; prepare documents to maintain an objective record of the process, including meeting summaries and annual and final reports; distribute agendas and meeting summaries; encourage everyone to participate; and moderate discussions as needed. The Coordinator is nonpartisan and is not an advocate for any particular interest or outcome.

Technical Advisory Committee

1. The overall goal of the Technical Advisory Committee (TAC) is to provide recommendations to the Task Force when requested based on the results of the scientific investigations. The TAC is given both broad direction and specific missions by the Task Force, and has the flexibility to determine how best to accomplish its job. The TAC has no authority to make policy decisions or recommendations on behalf of the Task Force; its role is to work as directed by the Task Force to ensure:
    - The right questions are asked;
    - The best approach and methods are used to answer questions;
    - The data collected are objective, defensible and trustworthy; and
    - The answers provided are understandable and relevant.