ProjectID: 32020

Inventory and Assessment of Stream/Riparian Resources, upper Boise and upper Payette River Subbasins, Idaho
Sponsor: WHA
Province: Middle Snake
Subbasin: Boise
FY03 Request: $176,000
5YR Estimate: ~~$176,000~~ $352,000
Short Description: Apply a hierarchical classification to identify complexes of stream/riparian resources with distinctive ecological potential and divide the complexes into more discrete areas based on condition relative to a progression of states. .

Response to ISRP Comments

ISRP Comment:

A response is needed indicating how this project would integrate with and provide data for other projects including the Council's use of EDT for the upcoming subbasin planning effort. We note that this mapping effort on riparian habitat may provide information at a finer scale than the Northwest Habitat Institute approach and hence be useful for subbasin planning efforts and long term monitoring.

Response:

The EDT Method is a hierarchical ecosystem approach to diagnosis of biotic conditions, viewed through the eyes of a target organism (Morbrand Biometrics 1999). Environmental attributes influencing biotic condition (e.g. channel stability, habitat diversity, riparian condition) serve as inputs to an analytical "scientific" model that is based on knowledge and assumptions about how natural systems work. Diagnosis entails comparing the current state of the watershed to a hypothetical potential state within the same watershed and to a hypothetical benchmark state for all watersheds.

The proposed assessment and inventory will provide environmental attributes influencing biotic condition (i.e. state, landform and vegetation type distributions and characteristics) nested in categories of distinctive potential (i.e. ecoregion, geologic district, subsection and valley-bottom type). Concepts for states (i.e. condition classes) will integrate morphological and spatial environmental attributes that may serve as input to the EDT scientific model.

Changes in state lead to predictable changes in the distribution and qualities of valley-landforms and riparian vegetation types. The distributions and qualities of states, landforms and vegetation types, nested in an evolutionary framework, are fundamental to understanding how natural systems work.

The proposed assessment and inventory will also provide spatial and morphological attributes for minimally disturbed reaches that will serve to characterize the hypothetical potential state for discrete valley-bottom types (defined in terms of geology, geomorphology and valley-form), thus facilitating rational diagnostic comparisons (apples with apples). Comparisons of current and potential states for valley-bottom types can be summarized for a stream reach, integrated over a tributary subbasin, or compiled for the entire watershed.

The extensive applications of this approach may also serve as a basis for characterizing the potential state for landscapes with distinctive evolutionary character (defined in terms of ecoregion, geologic district, subsection, and valley-bottom type). We have compiled broad-scale mapping for 37 million hectares including 210,830 km of stream in 11 ecoregions of the western United States. States, landforms and vegetation types have been mapped along more than 4,000 km of stream. Tabular summaries of the area/length of ecoregions, geologic districts, subsections, valley-bottom types, states, valley-landforms and riparian vegetation types identified in 25 Ecological Classifications are included as Attachment A.

The proposed inventory and assessment may also provide useful input for watershed analyses and as a basis for designing and prioritizing restoration.

ISRP Comment:

The proponent should discuss management applications in similar mapping projects and indicate potential applications in the Upper and Middle Snake Province. Need for this work is to some extent justified by the quote “inventory and map the distribution of riparian plant communities” stated in the Boise-Payette-Weiser Subbasin Summary. However, letters of support from management agencies would be helpful in assessing the need for the project.

Response:

We have completed similar mapping studies covering over 37 million hectares in the western United States. The approach was first developed to assess livestock and mining impacts to fishery resources in the North Fork Humboldt River basin in northern Nevada. The approach was refined through 25 applications in Washington, Montana, Oregon, Idaho, Wyoming, California, Nevada and Utah. Applications have been used for assessing livestock, mining and forestry impacts to stream**,** riparian**,** fishery, and wildlife resources. They have been used to identify appropriate fishery, riparian and wildlife control/treatments for Natural Resource Damage Assessments**.** More recently, they have served as the basis for water quality and TMDL assessments. Brief descriptions of management applications for each study follow.

Ecological classification, Bruneau River Basin, Idaho. 2001. Mapped and described ecoregions, geologic districts and subsections for about 1.6 million acres. Also mapped valley-bottom types, state (i.e. condition class), valley-bottom landforms and riparian vegetation types for selected subbasins. Results were used as the basis for assessing water quality parameters and TMDL relative to ecological potential. *Conducted for Idaho Department of Environmental Quality, Twin Falls, ID.*

Ecological classification, Coeur d'Alene, St. Joe and St. Regis River basins, Idaho and Montana. 2000. Mapped and described ecoregions, geologic districts and subsections for about 2.5 million acres and including about 4,681 linear miles of stream. Also mapped valley-bottom landtype, valley-bottom type, state, valley-bottom landform and riparian vegetation type for impacted and selected control streams. Results were used for fishery, riparian and wildlife Natural Resource Damage Assessment litigation. *Conducted for ASARC0 Inc., et al.*

Ecological classification, Bear River basin in Idaho. 1999. Identified (mapped) areas with distinctive water quality potential and identified the state (condition) of major tributaries for about 1.8 million acres, inclusive of about 673 linear miles of stream, in southeast Idaho. Information is being used to develop water quality and TMDL assessments for water quality limited subbasins. *Conducted for Idaho Division of Environmental Quality, Boise, ID*

Ecological Classification, Winnemucca District, Nevada. 1999. Mapped and described ecoregions, geologic districts and subsections for about 6 million acres in northern Nevada from small-scale information sources. Also mapped valley-bottom landtype, valley-bottom type, state, valley-bottom landform and riparian vegetation type from large-scale aerial photos for 31 watersheds comprising about 626,691 acres within the project area. Results were applied to livestock management to protect rare and endemic fish habitat. *Conducted for Winnemucca District BLM, Winnemucca, NV.*

Geologic districts and subsections in western Montana and northern Idaho. 1999. Conducted a broad-scale inventory for about 19.5 million acres to identify areas of distinctive ecological potential, based on similarities in climate, geology and geomorphology. Results were applied to forestry management and research to protect fishery and wildlife resources. *Conducted for Plum Creek Timber Company, Columbia Falls, MT.*

Ecological classification, upper Snake River basin, Idaho, Oregon, Nevada, Utah and Wyoming. 1999. The upper Snake River basin is about 4.7 million acres and contains 85,157 linear miles of stream, of which 30,400 miles is perennial. We classified and mapped geologic districts and subsections for the upper Snake River basin. We further classified and mapped valley-bottom type, state, landform and riparian vegetation types for several 6th code watersheds where water quality studies were conducted. Correlated results of water quality studies to the ecological classification. Upon review, the EPA accepted ecological classification as an approach for assessing TMDLs. *Conducted for Idaho Division of Environmental Quality, Twin Falls, ID.*

Ecological Classification, Rock Creek Basin, Montana. 1998. Detailed mapping of ecoregion, geologic districts, geomorphic classes, valley-bottom types and states (i.e. condition classes) was conducted for 569,386 acres of mountainous terrain including about 1,885 linear miles of stream. Results were used to assess stream segments favorable for bull trout spawning. *Conducted for US Forest Service Research Branch, Forest and Range Experiment Station, Missoula, Montana.*

Ecological classification, Eight Mile Creek basin, Humboldt County, Nevada. 1998. Mapped and described ecoregions, geologic districts, subsections, valley-bottom landtype, valley-bottom type, state, valley-bottom landform and riparian vegetation type for about 13,044 acres in northern Nevada. Results were applied to livestock management to protect rare and endemic fish habitat. *Conducted for US Forest Service, Santa Rosa Ranger District.*

Ecological classification, Marys River, Nevada. 1997. Applied a hierarchical classification to identify RRH with distinctive ecological potential and existing condition. The project area was 324,689 acres and included 1,341 linear miles of stream, all of which was classified to the level of valley-bottom type. Existing condition (i.e. state), riparian landform and riparian vegetation types were identified for perennial streams. Results were used to assess range management in the basin and habitat for rare and endemic fish. *Conducted for Elko District BLM, Elko, NV*.

Ecological classification, Thompson River basin, Montana. 1997. A hierarchical classification was applied to 410,276 acres that included about 1,326 miles of stream. Levels of classification were ecoregion, geologic district, landtype association, general landtype class, landtype, valley-bottom type and riparian habitat. A statistical similarity analysis for watersheds within the Thompson River basin was also conducted using cluster and discriminate analysis. Results served to evaluate effects of forestry practices on fish and wildlife resources. *Conducted* *for Plum Creek Timber Company, Columbia Falls, MT.*

Ecological stream classification, upper Blackfoot River basin, McDonald Gold project, Montana. 1996. Nested a stream classification into a hierarchical structure (Ecoregion, geologic district, landtype association, landtype, valley-bottom type, reach and state). The project area was 308,804 acres and included about 995 miles of stream. Results served as a baseline for predicting effects of proposed mining. *Conducted for Phelps Dodge Mining Company, Seven-Up/Pete Joint Venture, Helena, MT.*

Ecological classification, LeClerc/Harvey project area, Washington. 1996. Conducted a hierarchical classification for about 98,242 acres and 237 linear miles of stream in northeast Washington. Map levels included ecoregion, geologic district, landtype association, landtype, valley-bottom type and valley-bottom landform. Results served to evaluate forestry practices to protect fishery and wildlife resoures. *Conducted for Plum Creek Timber, Columbia Falls, MT.*

Ecological classification, Swan River basin, Montana. 1995. Conducted a hierarchical classification and inventory for about 408,630 acres and 1,257 linear miles of stream in western Montana. Information served as both an assessment of existing conditions relative to potential conditions and to evaluate effects of forestry practices on fishery and wildlife resources. *Conducted for Plum Creek Timber, Columbia Falls, MT.*

Ecological classification, Rock Creek basin, Nevada. 1995. Conducted a hierarchical classification for 808,476 acres and 3,366 linear miles of stream of which 262 miles is perennial. The focus was stream and riparian resources. Order 1 mapping of stream riparian habitat was conducted for all perennial stream. Information served as both an assessment of existing conditions and a baseline for monitoring effects of groundwater pumping on stream and riparian resources. *Conducted for Barrick Gold Mining Company, Elko, NV.*

Ecological classification, Maggie Creek basin, Nevada. 1995. Conducted a hierarchical classification for 253,736 acres and 847 linear miles of stream, of which 233 miles is perennial. The focus was stream and riparian resources. Order 1 mapping of stream riparian habitat was conducted for all perennial stream. Information served as both an assessment of existing conditions and a baseline for monitoring effects of groundwater withdrawal on stream and riparian resources *Conducted for Barrick Gold Mining Company, Elko, NV.*

Ecological classification, Habitat Conservation Plan project area, Washington. 1994. Conducted a hierarchical classification for 418,859 acres and 738 linear miles of streams in the Cascades. Results served as a basis for a Habitat Conservation Plan reviewed by President Clinton and Vice-President Gore. *Conducted for Plum Creek Timber, Seattle, WA.*

Ecological classification, Wenatchee, Methow and Okanogan Rivers, Washington. 1994. Applied a hierarchical classification to identify distinctive reaches of streams draining the eastern Cascades. The project area was about 9.5 million acres. About 218 linear miles of stream were classified to the level of valley-bottom type and state. Results served as a basis for fisheries studies. *Conducted for Don Chapman Consultants, Boise, ID.*

Inventory of stream/riparian habitat, Panther Creek basin. 1993. Utilized a hierarchical classification to identify reaches of the Panther Creek valley-bottom with distinctive geologic and geomorphic character. The inventory was also applied to other basins in the vicinity to identify potential controls for comparison with Panther Creek. The project area was about a million acres and included 1,660 linear miles of stream. Results served as the basis for a Natural Resource Damage Assessment of the Blackbird Mine. *Conducted for Don Chapman Consultants, Boise, ID.*

Ecological classification, Bruneau basin, Nevada. 1992. Applied a hierarchical classification to identify landtypes of distinctive ecological potential and vegetation types for 268,144 acres in the upper Bruneau River basin. Also conducted very detailed mapping of stream and riparian habitats for 1,218 linear miles of stream. Upland and stream/riparian inventories were fully integrated. *Conducted for Mountain City Ranger District, Mountain City, NV.*

Inventory and Assessment of Riverine/Riparian Habitat, Five-Mile Creek basin, Oregon. 1991. Conducted very detailed mapping of stream and riparian habitats in a tributary of the North Fork Powder River, Oregon. The project area was 32,256 acres with 89 linear miles of stream. *Conducted for John Day Ranger District, Ukiah, OR.*

Classification, inventory and assessment of riverine/riparian habitat, Clark Fork River, Bison Creek, Big Hole River, Beaverhead River, Ruby River basins, Montana. 1991. Applied a hierarchical classification to identify stream and riparian habitat of distinctive ecological potential and to identify areas of similar state. The project area was about 7,334,400 acres and about 652 linear miles were intensively studied. Results were used to select reference streams for a Natural Resource Damage Assessment of the upper Clark Fork River. *Conducted for Chapman Consultants, Boise, ID.*

Geologic districts of the Snake River Basin, Idaho. 1991. Identified and mapped areas of similar geologic character that contain stream/riparian of more similar ecological potential. *Conducted for Chapman Consultants, Boise, ID.*

Pine Creek watershed assessment, Lassen County, California. 1990. Applied a hierarchical classification, mapped and evaluated conditions influencing stream and riparian habitat critical for reproduction of Eagle Lake trout. Recommended structural and management alternatives to enhance restoration of Pine Creek. *Conducted for Lassen National Forest; Susanville, CA.*

Classification and assessment of riverine/riparian habitats, Bull Run Mountains, Nevada. 1990. Applied a hierarchical classification to identify similar achievable state and assessed condition relative to a progression of states. Results were used for assessing cumulative impacts of livestock and mining over a 1,000 square mile watershed. *Conducted for Freeport-McMoran Gold; Elko, NV.*

Classification of riverine/riparian habitats and assessment of nonpoint source impacts, North Fork Humboldt River basin, Nevada. 1989. Entailed preparation of a Technical Guidance Document for assessment of non-point source impacts and demonstration of the recommended approach in a Pilot Study that was conducted in the watershed of the North Fork Humboldt River. A Geographical Information System (GIS) was used to facilitate a hierarchical inventory of stream and riparian habitats. The project area was 382,080 acres and included 1,626 linear miles of stream. *Conducted for Intermountain Research Station, Boise, ID.*

We anticipate the proposed application to the upper Boise and Payette River basins will be useful for assessing the condition of stream and riparian resources relative to potential and/or achievable states. Results will serve as a basis for the evaluating the effects of management on stream, riparian, fishery, wildlife and water quality values at relatively fine spatial scale. Letters of support from the Boise National Forest and the Idaho Department of Environmental Quality are attached.

ISRP Comment:

The proposal needs a more fully developed plan for monitoring and evaluation of the accuracy of the maps and for use of the data in long-term aquatic habitat monitoring efforts. For example, mapped points should be checked with actual field visits with a double-blind sampling scheme. Targets should be set for error rates and the error rates estimated. What error rates have been achieved in previous projects? What magnitude of change can be detected if this mapping effort were to be repeated in, say 20 years?

Response:

Three common types of mapping error are: 1) delineation error; 2) label error; and 3) inclusions.

The magnitude of delineation error is largely determined by the scale of mapping and the specificity of the map unit. For broadly defined categories (i.e. Ecoregion, Geologic Districts and Subsections) mapped at small spatial scales (i.e. 1:3,000,000, 1:500,000 and 1:250,000, respectively), the magnitude of potential error is relatively large (10s of kilometers to kilometers); for more specific categories (i.e. valley-bottom type and state) mapped at intermediate scales (i.e. 1:15,000 and 1:6,000, respectively), the magnitude of potential error is smaller (i.e. decimeters to 10s of decimeters); for the most specific categories (i.e. landforms and vegetation types) mapped at the largest scale (i.e. 1:3,000), the magnitude of potential error is small (i.e. < 10 meters). Intermediate and specific categories will be mapped from aerial photos.

The distortions inherent to aerial photos (e.g. tilt, yaw, parallax) contribute additional "displacement" error. An analytical plotting scope (AP190) will be used to map intermediate and fine-scale features from aerial photos. Relative (common) points on adjacent photos are used to precisely link stereo pairs to within 0.03 mm. Absolute (control) points from quads or orthoquads are used to link photos to ground coordinates (UTM) to within 10 meters for X, Y and Z coordinates. Statistical programs built into the AP190 calculate the Residual root Mean Square (RMS) error for registration, relative and absolute parameters. These statistical measures will be used to document accuracy and precision.

Label error (identifying a polygon vegetation type #1 when it its actually #2) is influenced by the specificity at which map units are defined and the medium from which they are drawn. Distinguishing very specific classes of vegetation that appear similar on aerial photos (e.g. communities dominated by *Salix boothii* versus *Salix geyeriana*) is expected to result in a high degree of label error. Label error can be controlled by appropriate design of distinguishable map units. The frequency of label errors is also influenced by the resolution of the map base (e.g. aerial photos) and the experience of the interpreter. The "photo signatures" of landforms and vegetation types will be documented through a preliminary reconnaissance (Task B). Map features will be labeled while viewing the photos stereoscopically at large scales (1:1,000 to 1:3,000). Check plots will be edited to reduce random label errors.

We anticipate three types of fine-scale map units:

- ***Consociations:*** Map units consisting of a single dominant riparian vegetation type that can be distinguished from surrounding types.
- ***Associations****:* Map units consisting of two or more riparian vegetation types that are distributed in a predictable manner, but that may be difficult to distinguish from the resource photos.
- ***Complexes:*** Map units consisting of two or more community types that are distributed in an unpredictable manner, but that recur in similar landscape positions. The components of complexes cannot be distinguished from the resource photos.

All map units will contain some defined level of inclusions of contrasting types (e.g. <15 percent). The composition of map units will be first estimated from the aerial photos. The accuracy of these estimates will be evaluated through field sampling.

The products of preliminary mapping will include will be discrete numbered polygons labeled with landform and vegetation type attributes. We will randomly select a sample of at least 10 polygons from each class. Selected polygons will be identified on an unlabeled map (plotted on the aerial photo base). Selected unlabeled polygons will be identified in the field. If more than 1 of the selected polygons for each class is incorrect, additional field and photo review will be committed to remedy the error. The overall error will be estimated as the average error for all classes, weighted by the number of polygons in each class. The target for overall error rates will be less than 5 percent.

Field estimates of the composition of map units will be evaluated for at least 3 of the randomly selected polygons. Field estimates of map unit composition will be conducted using step transects. If field estimates of map unit composition are more than 10 percent different from photo estimates, additional field and photo review will be used to remedy the error.

Given a target for overall errors of less than 5 percent, a change of 10 percent could be detected through subsequent mapping.

LITERATURE CITED

Morland Biometrics, Inc. 1999. The EDT Method (August 1999-Draft). www,mobrand.com. 34 pp.

ATTACHMENT A –TABLES

Table 1. Ecological classification project areas.

PROJECT		AREA	STREAMS		
Name	Year	(ha)	PER (km)	INT (km)	TOTAL (km)
Lower Bruneau River, ID	2001	668970	869	6907	7776
Coer d'Alene, St. Joe and St. Regis, ID, MT,WA	2000	1642681	7874	13228	21102
Cub River, UT, ID	2000	57576	148	429	577
Bear River, ID	1999	728924	2364	5821	8185
Winnemucca District, NV	1999	2478078	751	3752	4504
Montana and Northern Idaho	1999	7894502	--	--	--
Upper Snake River, ID, OR, NV, UT, WY	1999	18925727	48914	88104	137018
Rock Creek, MT	1998	230427	1224	1809	3033
Eight Mile Creek, NV	1998	5166	21	82	103
Marys River, NV	1997	132828	381	1802	2183
Thompson River, MT	1997	165963	673	1461	2134
Upper Blackfoot River, MT	1996	124869	737	861	1598
LeClerc/Harveys, WA	1996	39758	205	176	381
Swan River, MT	1995	165370	927	1095	2022
Rock Creek, NV	1995	327186	422	4994	5416
Maggie Creek, NV	1995	102686	375	988	1363
HCP Project Area, WA	1994	169510	1026	161	1187
Wenatchee, Methow, Okanogan Rivers, WA[1]	1994	?	?	?	?
Panther, Loon, Big Creeks, ID[1]	1993	?	?	?	?
Upper Bruneau River, NV	1992	108516	378	1582	1960
Fivemile Creek, OR	1991	13060	42	110	152
Clark Fork, Big Hole, Beaverhead Rivers, MT	1991	3259162	4359	3211	7570
Bull Run Mountains, NV[1]	1990	?	?	?	?
Upper NF Humboldt River, NV	1989	154626	378	2190	2568
TOTAL		**37395585**	**72068**	**138763**	**210830**

[1] Map information for these projects has not yet been resurrected from the White Horse archives.

Table 2. Areas of Ecoregions (Omernik 1987) for ecological classification project areas in the western United States.

PROJECT		ECOREGIONS[2]										
Basin	Year	4 CASC (ha)	9 ECS&F (ha)	10 CP (ha)	11 BM (ha)	12 SRB/HP (ha)	13 NB&R (ha)	15 NR (ha)	16 MV&FP (ha)	17 MR (ha)	18 WB (ha)	19 W&UM (ha)
Lower Bruneau River, ID	2001	0	0	0	0	668970	0	0	0	0	0	0
Coer d'Alene, St. Joe and St. Regis, ID, MT,WA	2000	0	0	206537	0	0	0	1436143	0	0	0	0
Cub River, UT, ID	2000	0	0	0	0	0	22852	0	0	0	0	34724
Bear River, ID	1999	0	0	0	0	0	378965	0	0	35320	223797	90843
Winnemucca District, NV	1999	0	0	0	0	709219	1768860	0	0	0	0	0
Montana and Northern Idaho	1999	0	0	1795	0	0	0	6613926	1278781	0	0	0
Upper Snake River, ID, OR, NV, UT, WY	1999	0	0	0	1743100	11493853	2082655	1426856	0	2140672	38592	0
Rock Creek, MT	1998	0	0	0	0	0	0	198167	32260	0	0	0
Eight Mile Creek, NV	1998	0	0	0	0	0	5166	0	0	0	0	0
Marys River, NV	1997	0	0	0	0	0	132828	0	0	0	0	0
Thompson River, MT	1997	0	0	0	0	0	0	165963	0	0	0	0
Upper Blackfoot River, MT	1996	0	0	0	0	0	0	86526	38343	0	0	0
LeClerc/Harveys, WA	1996	0	0	0	0	0	0	39758	0	0	0	0
Swan River, MT	1995	0	0	0	0	0	0	165370	0	0	0	0
Rock Creek, NV	1995	0	0	0	0	0	327186	0	0	0	0	0
Maggie Creek, NV	1995	0	0	0	0	0	102686	0	0	0	0	0
HCP Project Area, WA	1994	158513	10997	0	0	0	0	0	0	0	0	0
Wenatchee, Methow, Okanogan Rivers, WA	1994	0	0	0	0	0	0	0	0	0	0	0
Panther, Loon, Big, ID	1993	0	0	0	0	0	0	0	0	0	0	0
Upper Bruneau River, NV	1992	0	0	0	0	0	108516	0	0	0	0	0
Fivemile Creek, OR	1991	0	0	0	13060	0	0	0	0	0	0	0
Clark Fork, Big Hole, Beaverheads, MT	1991	0	0	0	0	0	0	1141204	1887844	230114	0	0
Bull Run Mountains, NV	1990	0	0	0	0	0	0	0	0	0	0	0
Upper NF Humboldt River, NV	1989	0	0	0	0	0	154626	0	0	0	0	0
TOTAL		158513	10997	208332	1756160	12872042	5084338	11273914	3237228	2406105	262389	125567

[2] CASC = Cascades; ECS&F=Eastern Cascades Slopes and Foothills; CP=Columbia Plateau; BM=Blue Mountains; SRB/HP=Snake River Basin/High Plateau; NB&R=Northern Basin and Range; MV&FP=Montana Valleys and Foothill Prairies; MR=Middle Rockies; WB=Wyoming Basin; W&UM=Wasatch and Uinta Mountains;

Table 3. Areas of geologic districts for ecological classification project areas.

PROJECT		GEOLOGIC DISTRICTS[1]						
Name	Year	1000 METAS (ha)	2000 GRAN (ha)	3000 SED (ha)	4000 VOLC (ha)	5000 ALL (ha)	6000 LAC (ha)	9000 WAT (ha)
Lower Bruneau River, ID	2001	0	0	0	668970	0	0	0
Coer d'Alene, St. Joe and St. Regis, ID, MT,WA	2000	1103667	67617	0	280896	190500	0	0
Cub River, UT, ID	2000	0	0	31172	0	26404	0	0
Bear River, ID	1999	39334	0	437745	83019	154926	0	13900
Winnemucca District, NV	1999	201536	106609	0	1067380	382516	720036	0
Montana and Northern Idaho	1999	5842378	1001381	798030	252713	0	0	0
Upper Snake River, ID, OR, NV, UT, WY	1999	315478	1560482	3452941	9593432	3855221	0	148174
Rock Creek, MT	1998	195641	29728	0	5058	0	0	0
Eight Mile Creek, NV	1998	0	0	0	4702	461	3	0
Marys River, NV	1997	12410	0	0	120418	0	0	0
Thompson River, MT	1997	165963	0	0	0	0	0	0
Upper Blackfoot River, MT	1996	118626	0	0	6243	0	0	0
LeClerc/Harveys, WA	1996	11907	27851	0	0	0	0	0
Swan River, MT	1995	0	0	165370	0	0	0	0
Rock Creek, NV	1995	46537	0	0	230115	50535	0	0
Maggie Creek, NV	1995	24783	0	0	77902	0	0	0
HCP Project Area, WA	1994	25409	459	32237	111406	0	0	0
Wenatchee, Methow, Okanogan Rivers, WA[2]	1994	Present	0	Present	Present	0	0	0
Panther, Loon, Big, ID[2]	1993	Present	0	0	Present	0	0	0
Upper Bruneau River, NV	1992	14205	12697	12154	69460	0	0	0
Fivemile Creek, OR	1991	0	0	0	13060	0	0	0
Clark Fork, Big Hole, Beaverhead, MT	1991	2306148	186773	571934	50939	143367	0	0
Bull Run Mountains, NV[2]	1990	Present	Present	Present	Present	0	0	0
Upper NF Humboldt River, NV	1989	0	0	34914	32091	87621	0	0
TOTAL		**10424021**	**2993597**	**5536497**	**12667805**	**4891550**	**720039**	**162074**

[1]META (1000) = metamorphic; GRAN (2000) = granitic; SED (3000) = sedimentary; VOLC (4000) = volcanic; ALL (5000) = mixed alluvium; LAC (6000) = mixed lacustrine sediments; and WAT (9000) = open water.
[2]Map information for these basins has not been resurrected from the White Horse archives. Ecoregions are only listed as present

Table 4. State, landform and vegetation type map summary.

PROJECT		STATE			LANDFORM		VEG TYPE	
Name	Year	Done? (Y/N)	Length (km)	Area (ha)	Done? (Y/N)	Area (ha)	Done? (Y/N)	Area (ha)
Lower Bruneau River, ID	2001	y	375	8305	y	9223	y	9223
Coer d'Alene, St. Joe and St. Regis, ID, MT,WA	2000	y	1138	0	y	28289	y	28289
Cub River, UT, ID	2000	y	576	7407	n	--	y	6953
Bear River, ID	1999	n	--	--	n	--	n	--
Winnemucca District, NV	1999	y	446	0	y	4943	y	4943
Montana and Northern Idaho	1999	n	--	--	n	--	n	--
Upper Snake River, ID, OR, NV, UT, WY	1999	y	132	1420	y	1382	y	1346
Rock Creek, MT	1998	n	--	--	n	--	n	--
Eight Mile Creek, NV	1998	y	34	0	y	121	y	121
Marys River, NV	1997	y	334	0	y	8561	y	8561
Thompson River, MT	1997	n	--	--	n	--	y	29685
Upper Blackfoot River, MT	1996	y	181	0	n	--	y	3369
LeClerc/Harveys, WA	1996	n	--	--	y	3863	n	--
Swan River, MT	1995	n	--	--	y	21686	y	21686
Rock Creek, NV	1995	y	277	8215	y	8210	y	8211
Maggie Creek, NV	1995	y	109	2023	y	2022	y	2022
HCP Project Area, WA	1994	n	--	--	n	--	n	--
Wenatchee, Methow, Okanogan Rivers, WA	1994	n	--	--	n	--	n	--
Panther, Loon, Big Creeks, ID	1993	n	--	--	n	--	n	--
Upper Bruneau River, NV	1992	y	378	2755	y	2774	y	2774
Fivemile Creek, OR	1991	y	0	428	y	425	y	425
Clark Fork, Big Hole, Beaverhead Rivers, MT	1991	y	430	19125	n	--	n	--
Bull Run Mountains, NV[1]	1990	y	?	?	y	?	y	?
Upper NF Humboldt River, NV[1]	1989	n	0	0	y	?	y	?
TOTAL			**4410**	**49679**		**91499**		**127609**

[1]Map information for these basins has not yet been compiled from the WHA archives.

ATTATCHMENT B
SUPPORT LETTERS

File Code: 2520

Date: 03/14/2002

Sherman Jensen
White Horse Associates
140 North Main
Box 123
Smithfield, UT 84335

Dear Sherman

We have reviewed your proposal titled "Inventory and Assessment of Stream/Riparian Resources, upper Boise and Upper Payette River Subbasins, Idaho". As referenced in your proposal we are also very willing to support you in providing existing information and guidance for developing map unit legends. We expect that through our support as well as your commitment to coordinate with the Forest Service a product will result that is useful in making management decisions. The benefits as seen by the Forest Service include developing more informed watershed analysis, identify restoration needs, and providing a baseline for future reference. It may also help the Forest Service to accurately assess water quality status for input into the State's TMDL assessments.

Sincerely,

/S/ TJ CLIFFORD

T.J. Clifford
Boise National Forest Hydrologist

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

601 POLE LINE ROAD, SUITE 2 • TWIN FALLS, IDAHO 83301-3035 • (208) 736-2190

DIRK KEMPTHORNE, GOVERNOR
C. STEPHEN ALLRED, DIRECTOR

To Whom It May Concern:

This is a letter in support of the BPA proposal of Whitehorse Associates. In the past, the Idaho Department of Environmental Quality has contracted with Whitehorse Associates to provide Ecological Assessments. The first of these was in the Goose Creek Subbasin. This project was undertaken to develop export coefficients from rangeland activities for specific pollutants (sediment and phosphorus). These export coefficients can then be used to develop pollutant loads for Total Maximum Daily Loads (TMDL). Furthermore, post TMDL applications include TMDL implementation planning and localizing implementation efforts in critical areas based upon the classifications. IDEQ has since contracted with Whitehorse to provide ecological classifications in the Bruneau Subbasin. This work was directly related to the earlier work done in the Goose Creek Subbasin due to the fact both were completed in rangeland-land-use areas in the arid Snake River Basin High Desert ecoregion. The current proposal would expand the applicability of the work from desert rangelands to forested land uses. In addition, it would begin to build a body of information for post TMDL implementation as well as possibly being the corner stone for future TMDLs.

Sincerely,

Clyde H. Lay
Senior Water Quality Analyst
Twin Falls Regional Office
Twin Falls, Idaho