



REQUEST FOR PROPOSALS

Vegetation Mapping Project for Teton County, Wyoming

January 25, 2012

I. Purpose

Teton County intends to enter into a contract with a professional consultant to develop a Geographic Information System (GIS) digital layer of designated vegetation and non-vegetation cover-types for land use planning purposes. Successful completion of the project will produce a GIS digital layer of designated vegetation and non-vegetation cover-types on all lands in Teton County, Wyoming, excluding those under federal ownership by the US Forest Service, US Fish and Wildlife Service, and National Park Service. Land under the ownership of the Bureau of Land Management shall be included in this proposal.

II. Background

Teton County currently has an extensive GIS database for the use of the public and Teton County Staff. It is anticipated that this cover-type layer will be incorporated into the Teton County GIS database to be used for land use planning purposes.

III. Scope of Work and Services

A. General

The Consultant shall develop a digital layer of designated vegetation and non-vegetation cover-types that will be utilized with Teton County's current GIS.

B. Work Description:

1) Map Units:

The map units to be used are listed in bold in Exhibit 1. Map units for which a Code¹ and Map Unit Common Name² are listed are those used in the Grand Teton National Park 2002-2005 Vegetation Mapping Project Final Report (Technical Memorandum 8260-06-02) and are specifically defined and described therein (Section 3.3, Appendices C and F). Other map units are non-vegetative and self-explanatory. Additional map unit classifications may be used if necessary. Proposed map units may be further refined or divided into sub unit classifications. Newly created map unit classifications will be discussed and approved in the final contract and through monthly report updates and discussions with County Planning Staff, the Natural Resource Technical Advisory Board (NRTAB) and elected officials. Map unit classification keys will be provided by the County.

2) Map Base:

Digitized map units will use the 2011 Teton County color 1 foot/pixel orthorectified aerial photography as the base map. Additional ancillary data that can be made available includes: digital vegetation mapping on a limited number of private properties in Teton County provided for County-required environmental analyses; contact prints from 1999 County aerial photography; and LIDAR in limited areas of the County. All physical legacy data is the property of Teton County and shall be returned to the County, or proposals shall factor in the cost of obtaining duplicate copies of data to be used for this specific project.

- 3) Photo-interpretation:
As outlined in Section 2.5 of the aforementioned report, areas of readily identifiable homogeneous vegetation shall constitute the initial polygons (Exhibit 2). Elevation, slope, and aspect attributes will be based on the USGS National Elevation Database. Within any polygon, any area of a different recognizable vegetation type whose largest dimension exceeds the resolution listed in Exhibit 1 for that Map Unit must be mapped as a separate polygon. Any initial polygon comprising more than 30% disturbed area will be exempt from this requirement, except for the mapping of water bodies.
- 4) Digital Transfer:
Digital transfer will be performed as nearly as possible in the manner outlined in Section 2.6 of the GTNP report and so as to be fully compatible with the Teton County GIS database and Arc GIS Version 10.0.
- 5) Map Verification:
Initial verification will utilize those portions of the GTNP vegetation map which overlap onto private lands for comparison in regard to polygon location and map unit classification. Adequate ground truthing will be performed (site visits are required for a minimum of 35% of the polygons) in order to achieve the accuracy specified in the next section. Digital photos will be taken of representative map unit classifications for a minimum of 25% of the ground truthed sites and will be hot-linked to the ArcGIS shape files. Access to private lands will be acquired only via verbal or written permission from the landowner. Polygons without access will be assessed by visual reconnaissance from adjacent public land and private lands where access has been acquired. Any discrepancies can be used to revise the map, copies of which will then be sent to the Natural Resources Technical Advisory Board (NRTAB) and the planning staffs of Teton County and the Town of Jackson for review.
- 6) Accuracy Assessment:
Positional Accuracy:
Positional accuracy of polygon lines for vegetational Map Units will National Map Accuracy Standards, and assessment will be required for all roads, trails, and water bodies. The accuracy for the latter must satisfy standards for incorporation into the Teton County GIS database.

Thematic Accuracy:
For each Map Unit, an adequate number of accuracy assessment sites will be randomly chosen such that a set of sites (equal in number to, Exhibit 1) can be selected with adequate access, distribution among polygons, and distance from polygon boundaries. The minimum number of sites for each map unit is listed in Exhibit 1 (#AA Sites³). A lesser number of sites may be used if it can be demonstrated that a high level of accuracy is being achieved for that map unit. At each site, a GPS point (accuracy < 5 m) will be recorded and digital photos taken in the four cardinal directions to provide a record of the map unit classification and attributes. Photos will be hot-linked within the database. Based on the vegetation within a radius of 150 feet and taking some consideration of nearby vegetation types, three map unit assignments (primary, secondary, and tertiary) shall be made for the site. Three assessments, in the form of error matrices, will be made using these field-based assignments in comparison to those on the Map (for reference, see Section 3.5 of the GTNP report):

Binary Accuracy: If the primary field assignment matches the map polygon label, the site is scored as correct;

Acceptable Accuracy: If any of the three field assignments matches the map polygon label, the site is scored as correct;

Reasonable Accuracy: If any of the three field assignments matches the map labels of any polygons within 150 feet of the site, the site is scored as correct.
The minimum allowable accuracy will be 60%, 70%, and 80% for binary, acceptable, and reasonable accuracies, respectively.

Adjustments to accuracy assessments will be discussed and approved by County Planning Staff and the NRTAB.
- 7) Deliverables:

A GIS-based digital map of vegetation and other cover-types with polygon attributes as specified in Exhibit 2. Adjustments to attributes will be discussed and approved prior to the final contract and during monthly meetings with County Planning Staff and the NRTAB. Accessibility and format will meet the requirements of the Teton County GIS system and be compatible with Arc GIS Version 10.0 and Microsoft Office 2007 software.

A CD containing the final report and results of the Accuracy Assessment process including for each site its location, photos, description of vegetation, and the three map unit assignments will be provided to the NRTAB, Teton County Commission, and the Town of Jackson. Included also will be the error matrices for the three types of assessment.

Key Tasks	Deliverables	Format	Copies
Photo Interpretation of Vegetative Covertypes	Digital Transfer of vegetation mapping	Map Info or Arc GIS shape files	1
Map Verification/Accuracy Assessment	1. Ground truthing description	Text	Text – 10
	2. Photos of ground truthing	Digital photos hot-linked to Arc GIS database and text descriptions	1
	3. Positional Accuracy of all data - methodology	Text	Text – 10
	4. Final report, contents shall include, at minimum: a) Executive Summary b) Introduction c) Scope of work d) Methods e) Results f) Discussion g) Tables and Figures	Text, photos, illustrations	20
	See Grand Teton National Park Vegetation Mapping Project Final Report: http://biology.usgs.gov/npsveg/grte/index.html		

- a. 10 copies of each draft text or exhibit for Staff/NRTAB review.
- b. 20 copies of each document submitted for use in public meetings.
- c. All deliverables will be provided in electronic format, compatible with County operating systems. In each case, copies of large format exhibits (at least 36" x 48") reduced to 8 ½" x 11" or 11" x 17" shall also be provided.

IV. Estimated Cost of Services

The County has not yet budgeted for this item. The Consultant shall provide a detailed breakdown of services by tasks with hours, personnel, and cost of each task, including a total estimated cost of services.

V. Insurance Requirements

A. Insurance

The Consultant shall provide at its own expense the following insurance for its business entity and its employees in connection with the work required under this contract:

1. Worker's Compensation: Statutory.
2. General Public and Auto Liability: \$1,000,000 each occurrence and aggregate.

B. Liability

The Consultant shall indemnify and hold harmless the County against all forms of liability, claims, damages, demands, and including attorney fees, of every kind and nature and attributable to bodily injury, sickness, disease, or death, or to damage or destruction of property resulting from or in any manner arising out of or in connection with the performance of work under this contract.

VI. Employment Discrimination Prohibited

During the performance of a contract awarded pursuant to this "Request for Proposals," the Consultant agrees to not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin. The Consultant agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause. The Consultant, in all solicitations or advertisements for employees placed by or on behalf of the Consultant, will state that the Consultant is an equal opportunity employer. Notices, advertisements and solicitations placed in accordance with federal law, rule or regulation shall be deemed sufficient for meeting these requirements.

VII. Proposal Content

At a minimum, proposals shall contain the following information:

- A. **Understanding**: Consultant's understanding of project intent and scope, required services and work product;
- B. **Consultant Qualifications**: Qualifications of the Consultant, including a current company profile, qualifications of specific individuals who will provide the services and work product required for this project, their availability and time commitment, and examples of similar completed work and client references;
- C. **Insurance**: Required coverage (Workers' compensation, General public and auto liability);
- D. **Timetable**: for completion of work including key milestones;
- E. **Fee for Services**: with breakdown by tasks, budget time and cost per task, and including all expenses;
- F. **Conditions and Additional Services**: Specific contract and performance conditions, including hourly rates for additional services; and,
- G. **Exceptions**: Any exceptions to the requirements of this Request for Proposals.

VIII. Special Provisions

- A. **Prequalification**: Consultants may be pre-qualified by the County if it determines that a specific service or product is required. Pre-qualification shall not be used to exclude Consultants unless their services or products do not meet the expectation of County needs, determined solely and exclusively by Teton County, Wyoming.

- B. Fee for Services and Payments:** Invoicing and Payment terms shall be in accordance with the provisions of the Teton County Policies Handbook, Bid/Contract, Services – Contracting.
- C. Award of Contract:** The County shall select a Consultant and award a contract based upon the following criteria:
1. Demonstrated understanding of project scope and scope of Consultant services;
 2. Qualifications to perform required services;
 3. Cost basis, fee for services, and terms of payment;
 4. References of provider, and years in business;
 5. Ability to meet time requirements and proposed work plan; and
 6. Adequate insurance (verified with insurance required in bid specification).

The County may negotiate with two or more respondents. After negotiation with selected respondents, the County shall select the one that, in its opinion, has made the best overall presentation and cost projections. If the County determines that only one respondent meets the qualifications, it may enter into negotiations with that respondent. If proposals are comparable, local companies shall be given preference, primarily for businesses within Teton County, secondarily for businesses within Wyoming.

- D. Reservation of Rights:** Teton County reserves the right to reject any and all proposals, to waive irregularities in proposals received, to reject non-conforming, non-responsive or conditional proposals, and to accept the proposal that in the County's sole judgment best serves the interests of Teton County, Wyoming.
- E. Proposal Delivery:** Proposals must be received at the Teton County Planning & Development Department by

4:00 p.m., March 1, 2012.

Proposals received after this time and date will be returned unopened. It is the responsibility of the respondent to ensure the proposal arrives on time. Please provide eight bound copies of the proposal. Mail or deliver proposals to:

Teton County Planning & Development Department
P.O. Box 1727
200 S. Willow
Jackson, WY 83001.

Fee for Services proposal shall be firm for 6 months, beginning March 1, 2012

- F. Required Compliance:** The respondent awarded the contract shall be required to comply with all Teton County, State of Wyoming, and Federal requirements related to the contract.

Please direct any questions or requests for additional information regarding this Request for Proposals to Susan Johnson at the Teton County Planning & Development Department, (307) 733-3959.

EXHIBIT 1 - MAP UNITS

Code¹	Map Unit Common Name²	Non-GTNP Map Units	Resolution (feet)	# AA Sites³
Vegetated Areas				
FAP	Aspen Forest		50	20
FEP	Mixed Evergreen - Poplar Forest (Mixed Conifer - Aspen Forest)		100	20
FCW	Cottonwood Riparian Forest		20	20
FBS	Blue Spruce Riparian Forest		100	20
FRM	Mixed Cottonwood - Blue Spruce Riparian Forest		50	20
FMC	Mixed Conifer Forest		200	15
FDF	Douglas-Fir Forest		200	15
FSF	Subalpine Fir- Engelmann Spruce Forest		200	15
FLP	Lodgepole Pine Forest		200	15
FJ	Rocky Mtn. Juniper Woodland Stand		50	5
SAI	Alder Shrubland		50	5
SMR	Mixed Tall Deciduous Shrubland		50	20
SWL	Willow Shrubland		10	40
SSD	Sagebrush Dry Shrubland		200	10
DSE	Low Sagebrush Dwarf Shrubland		200	10
SES	Sage - Antelope Bitterbrush Mixed Shrubland		100	10
SSW	Sage/Shrubby Cinquefoil Mesic Shrubland		100	10
HGL	Mixed Grassland Herbaceous		200	10
HFD	Montane Mesic Forb Herbaceous		100	10

HGS	Flooded Wet Meadow Herbaceous		20	20
HA	Herbaceous Aquatics		10	10
VCT	Cliff & Talus Sparce Vegetation		100	5
VEH	Exposed Hillside Sparse Vegetation		200	5
VSL	Exposed Shore - Stream Deposit Sparse Veg.		20	5
VRB	Recently Burned Sparse Vegetation		100	5
NIP	Cropland and Pasture	Irrigated Agricultural	200	5
		Non-Irrigated Agricultural	200	5
Non-vegetated Areas				
NVS	Non-Vegetated Sand Bars		20	
	Disturbed Impervious		10	
NRD	Transportation, Communication, and Utilities	Paved Pathways Roads Gravel Roads Paved Structures		
	Disturbed Pervious		20	
NMS	Strip Mines, Quarries, & Gravel Pits	Corrals/Riding Arenas Horse/Ski Trails Lawn and Landscaping Golf Courses		
Water Bodies				
	Flowing Water Bodies		2	
NST	Streams			
NID	Irrigation canals			
	Standing Water Bodies		20	
NLP	Lakes & Reservoirs	Ponds		

Total Accuracy Assessment Sites

350

EXHIBIT 2: POLYGON ATTRIBUTES

AREA	Surface area of the polygon in meters squared
PERIMETER	Perimeter of the polygon in meters
TECOVEG#	Unique code for each polygon minus the universal polygon
TECOVEG-ID#	Unique identification code for each polygon
MAP_CODE	Map Unit Code
VEG_CNAME	Map Unit Common Name
ACRES	Surface area of the polygon in acres
HECTARES	Surface area of the polygon in hectares
ELEV_M	Elevation of the polygon centroid in meters
ELEV_FT	Elevation of the polygon centroid in feet
SLOPE	Average slope of the polygon at the centroid in degrees (0 flat– 90)
ASPECT	Average aspect of the polygon at the centroid in degrees (0-360)
DENS_MOD	Percent cover of the upper stratum layer in the polygon Sparse < 25%, Open 25-50%, Discontinuous 50-75%, Closed 75-100%
PTRM_MOD	Vegetation pattern within polygon Homogeneous – Evenly Dispersed, Alternating, Clumped/Bunched, Gradational/Transitional
HT_MOD	Height range of dominant vegetation layer (for Mixed Evergreen- Poplar and Mixed Cottonwood-Blue Spruce Riparian Forest the heights should be those poplars and cottonwoods, respectively) < 5 meters, 5-15 meters, > 15 meters
DOM_MOD	Dominant species present (use USDA plant codes)
ASPEN	Presence of aspen (Yes/No)
BURN	Evidence of recent (< 30 years) burning (Yes/No)
CULTIVATED	Evidence of recent (< 10 years) agricultural cultivation (Yes/No)
COMMENT	Comments on a specific polygon

EXHIBIT 3 ECO-RANKING AND COUNTY CROSSWALK

Map Unit	Height Classes	Rank	Teton County Covertypes
Aspen Forest	< 5 m	8	Aspen - Immature (Nm)
	5-15 m	7	Aspen - Mature (M)
	> 15 m	6	Aspen - Mature (Nm)
Mixed Evergreen - Poplar Forest (Mixed Conifer - Aspen Forest)	< 5 m aspen	6	Other Mixed Forest (M))
	5-15 m	6	
	> 15 m	5	
Cottonwood Riparian Forest	1-5 m	8	Narrowleaf Cottonwood - Immature (M)
	5-15 m	7	Narrowleaf Cottonwood - Medium (M)
	>15 m	6	Narrowleaf Cottonwood - Mature (M)
Blue Spruce Riparian Forest		6	
Mixed Cottonwood - Blue Spruce Riparian Forest	1-5 m cottonwood	7	Cottonwood/Spruce (M)
	5-15 m	7	
	>15 m	6	
Mixed Conifer Forest		5	Coniferous Forest (M)
Douglas-Fir Forest	1-5 m	5	Douglas Fir (Nm)
	5-15 m	6	
	>15 m	6	
Subalpine Fir- Engelmann Spruce Forest		5	Subalpine Fir/Spruce (Nm)
Lodgepole Pine Forest		4	Lodgepole Pine (Nm)
Rocky Mtn. Juniper Woodland Stand		5	Limber Pine/Juniper
Alder Shrubland		8	Tall Shrub (M)
Mixed Tall Deciduous Shrubland		7	Tall Shrub (M)

Willow Shrubland	< 2 m	10	Scrub-Shrub Wetland
	> 2 m	10	
Sagebrush Dry Shrubland		3	Xeric Shrub
Low Sagebrush Dwarf Shrubland		3	Xeric Shrub
Sage - Antelope Bitterbrush Mixed Shrubland		5	Mesic Shrub
Sage/Shrubby Cinquefoil Mesic Shrubland		5	Mesic Shrub
Mixed Grassland Herbaceous		1	Xeric Grassland
Montane Mesic Forb Herbaceous		3	Tall Forb (M)
Flooded Wet Meadow Herbaceous		9	Emergent Wetland
Herbaceous Aquatics		9	Emergent Wetland
Cliff & Talus Sparse Vegetation		3	
Exposed Hillside Sparse Vegetation		1	
Exposed Shore - Stream Deposit Sparse Veg.		2	
Recently Burned Sparse Vegetation		5	
Irrigated Agricultural		2	Agricultural Meadow
Non-Irrigated Agricultural		1	
Non-Vegetated Sand Bars		1	
Disturbed Impervious		0	
Disturbed Pervious		0	
Flowing Water Bodies			

Standing Water Bodies