WHITE PAPER

USDA Forest Service Pacific Northwest Region Umatilla National Forest

WHITE PAPER F14-SO-WP-SILV-57

The State Of Vegetation Databases On The Malheur, Umatilla, and Wallowa-Whitman National Forests[1]

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BACKGROUND

On June 30, 1999, 2.6 million acres in the Blue Mountains of northeastern Oregon and southeastern Washington were selected as a National Demonstration Area to accelerate forest and watershed restoration at a landscape level while contributing to the economic and social health of local communities. Before restoration activities could begin within the Blue Mountains Demonstration Area (BMDA), a prioritization process was implemented to ensure that limited dollars and personnel would be directed to those watersheds that had the greatest potential to show improvement in overall watershed health.

The ranking process was based on assessments of current vegetative, biological and physical status or 'integrity' of forested and rangeland ecosystems, as well as, the risks and opportunities available to maintain or improve current watershed conditions. Large portions of these assessments were based on current vegetative condition and the potential for large disturbance events such as fire, insects, and disease, to occur and degrade watershed health. During the ranking process it quickly became clear that assessments based on vegetative data from the Wallowa-Whitman, Umatilla, and Malheur National Forests were at differing levels of detail and that seamless comparisons were not possible, except at the broadest of scales.

In addition, Forest Plan revision is scheduled to begin in fiscal year 2004 and the Blue Mountain Forests have decided to work together at a Provincial scale. The need to integrate information across space and time requires compatible data sets. With

[1] White papers are internal reports; they receive only limited review. Viewpoints expressed in this paper are those of the author – they may not represent positions of the USDA Forest Service.

less than three years before the start of revision, questions that have been raised in the past as to the quality of our vegetation databases and our abilities to seamlessly merge and compare data across all three Forest boundaries have now become even more urgent.

Several attempts have been made to achieve a consistent approach for a provincial Forest Plan Revision process. Vegetation information data cannot be collected collaboratively, nor shared among users, unless the definitions and assumptions that support the information are consistent and agreed upon. Small task groups have convened numerous times in the past to resolve specific vegetation coding and definitions issues and have struggled to reach this critical, but elusive goal, called consistency. Countless hours of discussion, compromise, and effort on the part of many tri-forest individuals over the years has only resulted in frustration and no final resolution on many of these same consistency issues. Irreconcilable differences of opinion, or in vegetation classification philosophy, or just the lack of a decision maker with the appropriate authority to make a "final call" and allow the process to move forward has prevented our ability in the past to achieve a common path.

As a direct result of the short-term need in the BMDA to do landscape analysis and watershed restoration across a vast area with multiple ownerships - federal, state, private, tribal and municipal lands, and the longer term need to do Forest Plan revision on a large, provincial basis, a small, tri-forest Vegetation Database (Veg DB) Team has once again been assembled. Dave Powell, UMA Forest Silviculturist, Ray Smith, MAL Forest Analyst, Katie Countryman, WAW Forest Analyst, and Victoria Rockwell, WAW Forest Silviculturist have served as the core members of this Veg DB Team, along with periodic input and assistance from Ed Pugh, UMA Forest Planning Staff, Lyle Powers, MAL Forest Planning Team Leader, Dee Hines, WAW Forest Planning Staff, Alan Ager, UMA Forest Analyst, Bill McArthur, MAL Forest Silviculturist, Gene Yates, MAL Forest Botanist, and Bob Rainville, BMDA Coordinator.

This Veg DB Team was chartered to define the current status of vegetation data information across the Malheur, Umatilla, and Wallowa-Whitman National Forests and to recommend to the three Forest Supervisors how to resolve existing vegetation data gaps within and inconsistencies across the three Forests. The Veg DB Team believes this latest effort to resolve vegetation data issues will be more successful, and attribute this confident expectation to the unified commitment on the part of the three Forest Supervisors to make a final decision and resolve any professional differences that have been preventing agreement (see tri-forest letter on Unified Vegetation Databases, dated March 7, 2001, signed by all three Forest Supervisors, attached to end of document).

CURRENT STATUS

All three Forests have a vegetation layer in GIS with mapped polygons that delineate forested stands from non-forested, non-vegetated, or riparian stands. Addi-

tional work of various degrees is needed to better refine the riparian and non-forested polygons across all three Forests. In general, the Wallowa-Whitman has non-forested polygons mapped to a minimum of 2 acres in size and forested polygons down to 5 acres. Both the Umatilla and Malheur are currently mapping non-forested polygons down to 1 acre and forested polygons down to 2 acres.

There are some exceptions to these minimum polygon sizes in regards to timbered-stringers, where minimum widths have been used historically, and for some unique vegetative features, such as aspen or cottonwood, where individual points or small clumps of individuals are mapped and attributed.

The Malheur has not populated the polygons on their vegetative layer with any summarized stand data at this time. Vegetative data does exist on an individual project basis in the form of old stand exams, environmental assessment documents, or recently completed watershed analysis for approximately 50% of the Forest. It was estimated that it would take one person per district at least one year to track down this data, conduct a minimal accuracy check, and then input the information into a database. Once completed, the Forest would still only have 50% of the Forest characterized using data up to 15 years old.

The Umatilla and Wallowa-Whitman have an existing vegetation database (EVG) that contains summarized information for each of the polygons mapped on their respective vegetation layers. EVG was created and originally populated between 1989 and 1991 on both the Umatilla and Wallowa-Whitman. Both Forests used two primary data sources to characterize vegetation and populate EVG – interpretations of aerial photography and field-based stand exams.

Most of the exams used to populate EVG were conducted during the 1980s and early 1990s, and the data is now twenty years old in many cases. When considering the significant vegetation changes that have occurred since the early 1980s from wildfires, insect outbreaks, management activities and other disturbance events, there is real concern about the value of some of this older data.

On the Wallowa-Whitman, there have been periodic updates of the data in EVG, however, these updates have not been consistent on all ranger districts and many polygons have never been updated, re-interpreted, nor re-examined since 1989. There is a significant portion of the Forest (excluding the Eagle Cap Wilderness, Hell's Canyon National Recreation Area, and pieces of the Pine Ranger District) now covered with more recent aerial photography from flights conducted in 1997, 1999, and 2000. A full-scale, reinterpretation of these recent photos, however, has not been done to-date.

In late 1999, the Umatilla decided to go with 100% photo interpretation for their EVG database. The south half of the Forest was just recently re-interpreted using more current photo flights from 1995 and 1997. On the north half of the Forest, the Wenaha-Tucannon Wilderness is under contract to be re-interpreted in FY2001 us-

ing the 1997 photo flight. The remaining portion of the north half of the Forest will be flown in FY2001 and is currently under contract.

Aside from small, localized photo flights, and specific flights following major fires, the Malheur has not had an updated flight with full Forest coverage since 1989.

The following table summarizes the similarities and differences between the vegetation information data currently available on the Wallowa-Whitman, Umatilla, and Malheur National Forests.

	Malheur	Umatilla	Wallowa-Whitman
VEGETATION LAYER:			
Vegetation layer exists	Yes	Yes	Yes
Forested polygons delineated	Yes	Yes	Yes
Non-forested polygons delineated	Some	Yes	Yes
Non-veg polygons delineated	Some	Yes	Yes
Riparian polygons delineated	Yes	No	No
Minimum size of forested polygons	2 acres	2 acres	5 acres
Minimum size of non-forested polygons	1 acre	1 acre	2 acres
Ecoclass/PNV layer exists	Yes	Yes	Yes
Ecoclass/PNV layer complete/current	No	No	No
DEM layer exists	Yes	Yes	Yes
VEGETATION DATABASE:			
Veg Database (EVG) exists	No	Yes	Yes
EVG created/originally populated	Never	1989-1991	1989-1991
Data sources used	None	100% - PI	63% - PI 27% - Exams
Percent of Forest updated with current information within last 5 yrs	0%	50%	15%
Last time Forest had 100% photo coverage with one aerial photography flight	1989	1987/88	1987/88
Most recent photo flights	1998	1995/97	1997/99/00
Percent of Forest coverage from photography flights taken between 1995 – 2000	5%	50%	70%

DESIRED DATA SET

According to the Webster's dictionary, consistency is "…an agreement or logical relation of parts that affords comprehension or recognition; compatibility or agreement among successive acts, ideas, or events; conforming to the same principles or course of action". A consistent data set across all three Blue Mountains Forests will improve the prioritization process of watershed restoration work within the BMDA

in the short-term, and will provide for seamless analysis and the best information possible for Forest Plan revision across the Province in the longer-term.

Aside from significant vegetation data gaps that exist across the Forests, there are also inconsistencies in what type of data is collected and stored. Data is currently used in a variety of formats, collected in a variety of protocols, and manipulated using a variety of database systems. Consistency is the key. All three Forests must agree to map vegetation and to collect and populate vegetation information data using a core set of data parameters with the same definitions and codes.

Historically, the Wallowa-Whitman and Umatilla National Forests have relied on two primary data sources to characterize vegetation – interpretation of aerial photography and field-based stand examinations. Since photo interpreted (PI) data is remotely sensed and has limitations with respect to the type and range of vegetation attributes that can be determined, it is often considered to be a relatively low-resolution data source. PI data, however, is cost effective when compared with field surveys and is useful for analysis of vegetation trends at the national forest or biogeographical province scales.

Stand exams are on-the-ground surveys where a series of temporary plots are established in a randomized or grid pattern across the sampled area; vegetation characteristics such as tree diameters and heights are measured on each plot and then summarized to derive an average condition for the polygon (stand). Stand exams can provide site specific plant association information, numbers/species/size class and distribution of down, woody material, snags, and understory vegetation, as well as, numerous other resource attributes and measurements. Since individual trees are measured to specific tolerances and the measurements then summarized to statistically represent the sampled area (polygon), stand exams are considered to be a high-resolution data source.

Remote-sensed satellite imagery is another low-resolution data source that has sparked interest for its potential to provide low cost, vegetation information. It is currently valued for its ability to provide change detection over time across large landscapes and could be used to strategically narrow down the coverage that would require more intensive photo interpretation or field surveys to update existing vegetation data information.

With the need to be able to conduct analysis on vegetative structure, which is highly dependent on vertical layers, it is questionable whether the satellite imagery technology that is currently available to us today can adequately provide a baseline vegetation dataset, considering its lack of resolution and inability to detect vertical layers with acceptable reliability.

Between 1994 and 1998, Current Vegetation Survey (CVS) plots were installed across all three of the Blue Mountain Forests, replacing the old Continuous Forest Inventory (CFI) system of plots that had not been re-measured since 1979. The plot

data from these inventory and monitoring systems are normally stratified and then used for broad assessments such as forest planning.

The CVS plots were installed on a 1.7-mile grid in the commercial forest types, and on a 3.4-mile grid in the wilderness and non-forest types. Forest tree volumes and other calculated or derived information taken from these plots can be applied to similarly stratified polygons of mapped vegetation, thereby, providing a spatial component of the calculated or derived information. If a vegetation map does not exist, however, this information would have no spatial component. The expansion factor for each 1.7-mile grid plot is 1,850 acres, and the total acres by stratum would be applied to the forest as a whole. If enough plots are available in each stratum for a smaller area, a sub-basin or watershed for instance, those plots could be used to calculate or derive data to be applied to that area.

Given that the CVS plots expand to characterize such large areas, and lack anything but the broadest spatial component, it is doubtful that there would be enough plots in each stratum to have much validity for planning purposes at the mid-scale or project level. The CVS plots are no substitute for a detailed vegetation map.

Therefore, in order to proceed with recommendations on how to achieve consistency, the Veg DB Team has made some preliminary assumptions on a data source to use and the basic mandatory minimum fields needed to populate our vegetation information databases.

Assumption #1

The recommended data source will be ***photo interpretation***;

Assumption #2

The **mandatory minimum database fields** to be populated will be:

Fields from **Photo Interpretation**

- *Number of live **VERTICAL CANOPY LAYERS**;*
- ***SPECIES** by layer;*
- ***SIZE CLASS** by layer;*
- ***CANOPY CLOSURE** - by layer and for total stand;*
- ***SNAGS** - number by size class (<12", 12-21", >21") for total stand;*

Fields that can be **DERIVED** from the five basic photo interpreted fields

- ***Structure***
- ***Cover Type***
- ***Fire Regime***
- ***Fire Condition Class***
- ***Fuel Model***
- ***UPEST (insect and disease) ranking***
- ***Other derived forest characteristics** whose definitions may change over time*

Fields **CALCULATED** or **EXTRACTED** from other existing data sources

- *Stand* ***Slope*** — Digital Elevation Model (DEM)
- *Stand* ***Aspect*** — DEM
- *Stand* ***Elevation*** — DEM
- ***Ecoclass*** — Ecoclass layer (PNV)
- ***Potential Vegetation Group*** *(PVG)* — Ecoclass layer (PNV)
- ***Mid-scale Vegetation Group*** *(Plant Association Group (**PAG**), Potential Vegetation Type (**PVT**), or Biophysical environment)* — Ecoclass layer (PNV)

Assumption #3

Database parameters will use existing EVG definitions and codes as a starting point. Existing definitions and codes will be reviewed and agreed upon for consistency by two separate tri-forest teams, a Forested Vegetation Team for forested polygons, and a Non-forested Vegetation Team for the non-forested, rangeland and riparian polygons. The Teams will be comprised of silviculturists, botanists, ecologists, range managers, fuels specialists, and hydrologists. Recommended changes to existing EVG definitions and codes will be written up as formal proposals to the tri-forest GIS group that is responsible for maintaining a current working copy of the GIS Data Dictionary and incorporating any approved changes.

RESOURCES NEEDED

Field-based surveys, or stand exams, across all polygons would be the ideal data source to meet large-scale analysis, as well as, fine-scale project level planning needs. Unfortunately, the cost of such an undertaking, at approximately $15-20 per plot and an average of 10 plots per 40-acre stand, would be astronomical across such a large land base. Secondly, the timeline in which we would have to conduct these stand exams and completely populate or update our vegetation databases in order to meet the current Forest Plan revision schedule, less than three years, is entirely unrealistic.

Recognizing that coverage from current satellite imagery technology cannot provide adequate detail to determine vertical structure, an extremely important component in vegetation analysis today, and that stand exams are not feasible in terms of cost and time on such a broad scale, it is the Veg DB Team's recommendation that photo interpretation would be the best compromise in dollars, time, and resolution to provide more than adequate information for large landscape analysis, such as provincial Forest Planning and mid-scale watershed analysis, and to a somewhat lesser standard, for project level planning purposes.

Some argue that in order to properly characterize vegetation for Forest Planning purposes, all lands included in the analysis should be characterized from one distinct aerial photography flight. The cost of flying the entire Malheur, Umatilla, and

Wallowa-Whitman National Forests under one photo flight is estimated at approximately $500,000--based on six million National Forest administered acres, at $50 per square mile. This estimate does not include private, state, or other federal agency lands within or immediately adjacent to the actual administered Forest boundaries.

As more emphasis is placed on analysis, management, and accountability at the watershed scale, it is not unreasonable to expect that the total land base to be flown could increase to nearly nine or ten million acres if those watersheds that are included in the National Forest administered lands are expanded to their entirety in order to include all ownerships and not just the national forest land portions of a watershed. A photo flight of that magnitude would easily increase the cost of the photos to nearly $800,000.

In addition to the photos themselves, there would be another $1,500,000 for the cost of photo interpretation, field validation, Potential Natural Vegetation (PNV) mapping, and database population for the 6 million acres of administered National Forest lands, and approximately $2,500,000 for the expanded 10 million acre multiple-ownership land base. Therefore, it is estimated that one complete photo flight and corresponding photo interpretation across all three Forests could range between $2 and $3.5 million.

As mentioned earlier, both the Wallowa-Whitman and Umatilla National Forests have had recent photo flights in the past 5 years, which cover significant portions of their total administered land base. To have an aerial photography flight flown across the entire Blue Mountains Province during the same year would be extremely costly and may not even be contractually possible due to the large acreages involved. It is the general consensus by the Veg DB Team that photo flights taken since 1995 can be used for our short-term BMDA needs, as well as, our pending Forest Plan revision.

Since the Malheur does not have much of the Forest covered with recent photography, a full photo flight is recommended. In addition, those portions of the Wallowa-Whitman that have not been covered by photography in the last 5 years (Eagle Cap Wilderness, Hell's Canyon NRA, and portions of the Pine district) should also be flown.

A full photo interpretation will be needed once the Malheur photo flight has been completed, as well as, on those portions of the Wallowa-Whitman that are not currently covered under an existing recent photo flight. Based on a change detection flight to determine where significant vegetation changes have occurred since the early 1990's, the Wallowa-Whitman will also need to have additional photo interpretation done using the existing photography flown in 1997, 1999, and 2000.

Since the initial creation and population of vegetative data into the EVG database, various degrees of updating, based on post-activity surveys or large fires, has been conducted by the districts on the Wallowa-Whitman over the years, but not

consistently. A significant portion of the LaGrande Ranger District was re-interpreted in FY2001 through a collaborated effort between the BMDA and the PNW Research Station. The LaGrande district could use a significant portion of that effort to help update information within their existing EVG database that is currently outdated. Considering the partial updates that have been occurring periodically, an entire Forest re-interpretation is not anticipated for the Wallowa-Whitman.

The Umatilla will soon have full aerial photo coverage from recent photography taken in 1995, 1997, and a 2001 scheduled flight currently under contract. Photo interpretation has also been completed on the entire south half of the Forest and will be completed in FY2001 for the Wenaha-Tucannon Wilderness portion of the north half of the Forest. All that remains to complete the Umatilla NF's update of their EVG database, will be photo interpretation on the remainder of the north half of the Forest using the current photo flight being flown in FY2001 and the completion of PNV mapping. Both the Malheur and Wallowa-Whitman will also need to complete PNV mapping prior to Forest Plan revision.

Personnel specifically assigned to completion of such a large photo flight and interpretation project, as we are recommending across the Province, do not exist within our current organizations on the three Forests today. There will be a need, however, for overall coordination, contract preparation and administration, quality assurance, and monitoring to ensure that data standards and timelines are met.

The cost of one complete aerial photo flight across all three Forests and then followed by either stand exams or a full-scale photo interpretation project is unrealistic in dollars available and timeframes to meet short-term needs within the BMDA and longer-term needs for Forest Plan revision. A chart on the next page illustrates a more realistic and achievable cost to reaching consistency by making full use of recent photo flights and other updating efforts that have been ongoing.

RECOMMENDATIONS

A tri-forest, provincial Forest Plan revision is scheduled to begin in FY2004, less than three full years away. Currently, our vegetative data information will not provide seamless analysis across the Province. PNW Research is developing computer models at this time to assess resource output capabilities from our National Forest System lands and to project consequences of alternative management actions. To ensure validity of such models, vegetation information needs to reflect current conditions and to be consistent across the land base being modeled.

Local communities interested in creating family-wage jobs and improved economic conditions are requesting assessments of potential timber products from the forests of Northeast Oregon. Again, such assessments are of little value if the vegetation information is outdated and inconsistent. There are significant differences between our three Forests in the data that has been collected and stored for our planning and analysis needs.

	MAL NF	UMA NF	WAW NF	TRI-FOREST
AERIAL PHOTOGRAPHY NEEDS				
Within BMDA…				
Photo Flight coverage (in acres)	*410,000*	*0*	*450,000*	*860,000*
Estimated Cost (@ $50 per square mile)	*$32,000*	*$0*	*$35,000*	*$67,000*
Additional Photo sets	*$4,700*	*$0*	*$5,300*	*$10,000*
Change Detection Flight (@ $600 per scene)	*$0*	*$0*	*$1,200*	*$1,200*
Subtotal within BMDA	*$36,700*	*$0*	*$41,500*	*$78,200*
Outside BMDA…				
Photo Flight coverage (in acres)	*2,969,200*	*0*	*250,000*	*3,219,200*
Estimated cost (@ $50 per square mile)	*$232,000*	*$0*	*$19,500*	*$251,500*
Additional Photo sets	*$34,300*	*$0*	*$3,000*	*$37,300*
Change Detection Flight (@ $600 per scene)	*$0*	*$0*	*$2,400*	*$2,400*
Subtotal outside BMDA	*$266,300*	*$0*	*$24,900*	*$291,200*
TOTAL AERIAL PHOTOGRAPHY NEEDS	***$303,000***	***$0***	***$66,400***	***$369,400***
PHOTO INTERPRETATION (PI) NEEDS				
Within BMDA…				
New Photo flight coverage (in acres)	*280,000*	*0*	*450,000*	*730,000*
Existing Photo flight coverage (in acres)	*0*	*186,000*	*150,000*	*336,000*
Estimated Cost (@ $0.15 per acre)	*$42,000*	*$27,900*	*$90,000*	*$159,900*
Field Validation (@ slightly less than $0.01 per acre)	*$2,500*	*$2,900*	*$6,000*	*$11,400*
Subtotal within BMDA	*$44,500*	*$30,800*	*$96,000*	*$171,300*
Outside BMDA…				
New Photo flight coverage (in acres)	*1,428,870*	*0*	*250,000*	*1,678,870*
Existing Photo flight coverage	*0*	*364,500*	*500,000*	*864,500*
Estimated Cost (@ $0.15 per acre)	*$214,331*	*$54,675*	*$112,500*	*$381,506*
Field Validation (@ slightly less than $0.01 per acre)	*$11,500*	*$3,100*	*$6,000*	*$20,600*
Subtotal outside BMDA	*$225,831*	*$57,775*	*$118,500*	*$402,106*
TOTAL PHOTO INTERPRETATION NEEDS	***$270,331***	***$88,575***	***$214,500***	***$573,406***
PNV MAPPING NEEDS				
Within BMDA…				
PNV Mapping and Classification (@ $0.20 per acre)	*$13,000*	*$14,000*	*$30,000*	*$57,000*
Outside BMDA…				
PNV Mapping and Classification (@ $0.20 per acre)	*$37,000*	*$36,000*	*$50,000*	*$123,000*
TOTAL PNV MAPPING NEEDS	***$50,000***	***$50,000***	***$80,000***	***$180,000***
ADDITIONAL PERSONNEL NEEDS				
Person years needed	*2*	*0.5*	*2*	*4.5*
Estimated cost (based on salary of $38,000 per year)	*$76,000*	*$19,000*	*$76,000*	*$171,000*
Vehicle Cost (FOR/mileage/use @ $5,000 per year)	*$10,000*	*$2,500*	*$10,000*	*$22,500*
TOTAL ADDITIONAL PERSONNEL NEEDS	***$86,000***	***$21,500***	***$86,000***	***$193,500***
Subtotal within BMDA	***$137,200***	***$55,550***	***$210,500***	***$403,250***
Subtotal outside BMDA	***$572,131***	***$104,525***	***$236,400***	***$913,056***
TOTAL NEEDS	***$709,331***	***$160,075***	***$446,900***	***$1,316,306***

Much of the current data is outdated and large data gaps exist over significant portions of the tri-forest Provincial land base. There are inconsistencies in the codes and definitions being used to characterize vegetation information among the Forests. And so, it has been recognized that the establishment of a unified and consistent vegetative database among the Forests within the Blue Mountains is vital to the effectiveness of both short-term and long-term planning within our Province.

Based on the information presented in this paper, the Veg DB Team has the following recommendations to offer in regards to the establishment and maintenance of a consistent vegetation information database across the three Forests within the Blue Mountains Province.

- Adopt photo interpretation as the data source to populate our vegetation databases.
- Adopt the mandatory minimum database fields described in the "DESIRED" DATA SET section of this document.
- Adopt EVG database definitions and codes as the starting point to review and agree upon.
- Meet the existing contract commitments on the Malheur NF to complete a full aerial photography flight and photo interpretation prior to Forest Plan revision in FY04.
- Complete aerial photo coverage and photo interpretation on those portions of the Wallowa-Whitman NF that are not currently covered under recent photo flights conducted in 1997, 1999, and 2000.
- Obtain change detection scenes for the Wallowa-Whitman NF and determine where significant vegetation changes have occurred prior to and since the latest photo flights were taken.
- Use recent photo flights from 1997, 1999, and 2000, to re-interpret and update those polygons on the Wallowa-Whitman NF that demonstrated significant vegetation changes as based on the change detection analysis described above.
- Complete photo interpretation on the north half of the Umatilla NF using both the recent photo flight from 1997, and the scheduled flight currently under contract to be flown in 2001.
- To meet short-term BMDA needs, request that any mid-year dollars allocated to the BMDA in FY2001 will go to help fund photo flights and photo interpretation on the Malheur, Wallowa-Whitman, and Umatilla, in that order of priority. In addition, request and allocate BMDA funds in FY2002 to further vegetation database updating activities (photo interpretation, PNV mapping, etc.) within the BMDA, to the fullest extent possible, to meet Forest Plan revision needs for FY2004.

- To meet longer-term needs for Forest Plan revision, and beyond the limits of funding and priorities within the BMDA, identify the completion of photo flights, photo interpretation, PNV mapping, and EVG database updates as high priority on all three Forests. Request funding in the next outyear budgeting process that is commensurate with the urgency and need to complete all database updating and consistency activities by the beginning of Forest Plan revision in FY2004.
- Charter a Forested Vegetation Task Group to complete a review for consistency of, and agreement to, the definitions and codes relating to forested polygons and their respective vegetation data information. Develop a recommendation for the Area Ecologist's review by August 31, 2001.
- Charter a Non-forested Vegetation Task Group to complete a review for consistency of, and agreement to, the definitions and codes relating to rangelands and non-forested polygons and their respective vegetation data information. Develop a recommendation for the Area Ecologist's review by August 31, 2001.
- Direct the Area Ecologist to review the above-mentioned task groups' proposals and provide a recommendation to the three Forest Supervisors for a decision by October 1, 2001.
- In order to maintain consistency across the Province, document major agreements and decisions pertaining to vegetation data information with a triforest letter signed by all three Forest Supervisors.
- Unless major changes in vegetation data information definitions and codes are needed, reduce the amount of constant recycling of data information issues and move forward from the point of signed agreements into implementation.

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Route To:

Subject: Unified Vegetation Database

To: Malheur FLT
Umatilla FLT
Wallowa-Whitman FLT

Establishment of a unified vegetative database among the Forests within the Blue Mountains is vital to the effectiveness of long-term planning within our Province. By signing the attached agreement we wish to demonstrate our determination to work together to establish and maintain a consistent database.

Based on this agreement, we will ask our staff to identify and prioritize needed work. We expect our staffs to define parameters, definitions, codes and structure that are consistent between Forests and with NRIS. Where professional differences prevent agreement, we expect a summary of the positions (concerns and needs) and alternatives. We will make decisions needed to achieve a common path. We want agreement on a framework completed by June 1, 2001.

/s/Bonnie J. Wood	***/s/Jeff D. Blackwood***	***/s/John C Schuyler***
BONNIE J. WOOD	JEFF D. BLACKWOOD	KARYN L. WOOD
Forest Supervisor	Forest Supervisor	Forest Supervisor
Malheur NF	Umatilla NF	Wallowa-Whitman NF

AGREEMENT BETWEEN THE MALHEUR, UMATILLA, AND WALLOWA-WHITMAN NATIONAL FORESTS TO ESTABLISH A UNIFIED CONSISTENT VEGETATION DATABASE FOR THE THREE FORESTS
March 7, 2001

The Blue Mountain Forests agree to:

1. Define a vegetative data set composed of parameters, definitions/codes, and structure that are consistent between Forests and with NRIS direction.

2. Adopt photo interpretation as the standard data set for mid-term planning (over the next 3 to 5 years).

3. Complete the existing Landsat effort on the Malheur in 2001 to provide short-term stand typing. As part of this effort, the Malheur will evaluate the utility of the technique for future use. The Malheur will use the same parameters and definitions as agreed to in #1. They will also evaluate new technologies as they become available.

4. Consider Landsat technology for use in gathering information where needs are less rigorous and when funding will not support photo interpretation technology. Landsat may be used as a tool to detect vegetation changes and identify where updated vegetation information is needed.

5. Place an immediate priority on getting the Malheur consistent with the other two Forests.

6. Consult and reach consensus with all three Forests before pursuing any changes in the points of this agreement.

/s/Bonnie J. Wood	***/s/Jeff D. Blackwood***	***/s/John C. Schuyler***
BONNIE J. WOOD	JEFF D. BLACKWOOD	KARYN L. WOOD
Forest Supervisor	Forest Supervisor	Forest Supervisor
Malheur NF	Umatilla NF	Wallowa-Whitman NF

APPENDIX: SILVICULTURE WHITE PAPERS

White papers are internal reports, and they are produced with a consistent formatting and numbering scheme – all papers dealing with Silviculture, for example, are placed in a silviculture series (Silv) and numbered sequentially. Generally, white papers receive only limited review and, in some instances pertaining to highly technical or narrowly focused topics, the papers may receive no technical peer review at all. For papers that receive no review, the viewpoints and perspectives expressed in the paper are those of the author only, and do not necessarily represent agency positions of the Umatilla National Forest or the USDA Forest Service.

Large or important papers, such as two papers discussing active management considerations for dry and moist forests (white papers Silv-4 and Silv-7, respectively), receive extensive review comparable to what would occur for a research station general technical report (but they don't receive blind peer review, a process often used for journal articles).

White papers are designed to address a variety of objectives:

(1) They guide how a methodology, model, or procedure is used by practitioners on the Umatilla National Forest (to ensure consistency from one unit, or project, to another).
(2) Papers are often prepared to address ongoing and recurring needs; some papers have existed for more than 20 years and still receive high use, indicating that the need (or issue) has long standing – an example is white paper #1 describing the Forest's big-tree program, which has operated continuously for 25 years.
(3) Papers are sometimes prepared to address emerging or controversial issues, such as management of moist forests, elk thermal cover, or aspen forest in the Blue Mountains. These papers help establish a foundation of relevant literature, concepts, and principles that continuously evolve as an issue matures, and hence they may experience many iterations through time. [But also note that some papers have not changed since their initial development, in which case they reflect historical concepts or procedures.]
(4) Papers synthesize science viewed as particularly relevant to geographical and management contexts for the Umatilla National Forest. This is considered to be the Forest's self-selected 'best available science' (BAS), realizing that non-agency commenters would generally have a different conception of what constitutes BAS – like beauty, BAS is in the eye of the beholder.
(5) The objective of some papers is to locate and summarize the science germane to a particular topic or issue, including obscure sources such as master's theses or Ph.D. dissertations. In other instances, a paper may be designed to wade through an overwhelming amount of published science (dry-forest management), and then synthesize sources viewed as being most relevant to a local context.
(6) White papers function as a citable literature source for methodologies, models, and procedures used during environmental analysis – by citing a white paper, specialist reports can include less verbiage describing analytical databases, techniques, and so forth, some of which change little (if at all) from one planning effort to another.
(7) White papers are often used to describe how a map, database, or other product was developed. In this situation, the white paper functions as a 'user's guide' for the new product. Examples include papers dealing with historical products: (a) historical fire extents for the Tucannon watershed (WP Silv-21); (b) an 1880s map developed from General Land Office sur-

vey notes (WP Silv-41); and (c) a description of historical mapping sources (24 separate items) available from the Forest's history website (WP Silv-23).

The following papers are available from the Forest's website: Silviculture White Papers

Paper #	Title
1	Big tree program
2	Description of composite vegetation database
3	Range of variation recommendations for dry, moist, and cold forests
4	Active management of dry forests in the Blue Mountains: silvicultural considerations
5	Site productivity estimates for upland forest plant associations of the Blue and Ochoco Mountains
6	Fire regimes of the Blue Mountains
7	Active management of moist forests in the Blue Mountains: silvicultural considerations
8	Keys for identifying forest series and plant associations of the Blue and Ochoco Mountains
9	Is elk thermal cover ecologically sustainable?
10	A stage is a stage is a stage…or is it? Successional stages, structural stages, seral stages
11	Blue Mountains vegetation chronology
12	Calculated values of basal area and board-foot timber volume for existing (known) values of canopy cover
13	Created opening, minimum stocking level, and reforestation standards from the Umatilla National Forest land and resource management plan
14	Description of EVG-PI database
15	Determining green-tree replacements for snags: a process paper
16	Douglas-fir tussock moth: a briefing paper
17	Fact sheet: Forest Service trust funds
18	Fire regime condition class queries
19	Forest health notes for an Interior Columbia Basin Ecosystem Management Project field trip on July 30, 1998 (handout)
20	Height-diameter equations for tree species of the Blue and Wallowa Mountains
21	Historical fires in the headwaters portion of the Tucannon River watershed
22	Range of variation recommendations for insect and disease susceptibility
23	Historical vegetation mapping
24	How to measure a big tree
25	Important insects and diseases of the Blue Mountains
26	Is this stand overstocked? An environmental education activity
27	Mechanized timber harvest: some ecosystem management considerations
28	Common plants of the south-central Blue Mountains (Malheur National Forest)
29	Potential natural vegetation of the Umatilla National Forest
30	Potential vegetation mapping chronology
31	Probability of tree mortality as related to fire-caused crown scorch

Paper #	Title
32	Review of the "Integrated scientific assessment for ecosystem management in the interior Columbia basin, and portions of the Klamath and Great basins" – forest vegetation
33	Silviculture facts
34	Silvicultural activities: description and terminology
35	Site potential tree height estimates for the Pomeroy and Walla Walla ranger districts
36	Tree density protocol for mid-scale assessments
37	Tree density thresholds as related to crown-fire susceptibility
38	Umatilla National Forest Land and Resource Management Plan: forestry direction
39	Updates of maximum stand density index and site index for the Blue Mountains variant of the Forest Vegetation Simulator
40	Competing vegetation analysis for the southern portion of the Tower Fire area
41	Using General Land Office survey notes to characterize historical vegetation conditions for the Umatilla National Forest
42	Life history traits for common conifer trees of the Blue Mountains
43	Timber volume reductions associated with green-tree snag replacements
44	Density management field exercise
45	Climate change and carbon sequestration: vegetation management considerations
46	The Knutson-Vandenberg (K-V) program
47	Active management of quaking aspen plant communities in the northern Blue Mountains: regeneration ecology and silvicultural considerations
48	The Tower Fire…then and now. Using camera points to monitor postfire recovery
49	How to prepare a silvicultural prescription for uneven-aged management
50	Stand density conditions for the Umatilla National Forest: a range of variation analysis
51	Restoration opportunities for upland forest environments of the Umatilla National Forest
52	New perspectives in riparian management: Why might we want to consider active management for certain portions of riparian habitat conservation areas?
53	Eastside Screens chronology
54	Using mathematics in forestry: an environmental education activity
55	Silviculture certification: tips, tools, and trip-ups
56	Vegetation polygon mapping and classification standards: Malheur, Umatilla, and Wallowa-Whitman national forests
57	The state of vegetation databases on the Malheur, Umatilla, and Wallowa-Whitman national forests

REVISION HISTORY

March 2014: This revision implemented the new white-paper template format, and minor formatting and editing changes were made throughout the document.