Appendix H – EUI Defined

INTRODUCTION

The Ecological Unit Inventory (EUI) used in the Lower Scott Ecosystem Analysis provides information about the production capabilities, management opportunities, and limitations to land use. EUIs are developed by an interdisciplinary team and form the basis for land capability determinations for land management planning (FSH 2090.11, Ch. 3, p.2).

A primary function of EUI is to build a Forest-Wide GIS database that is compatible, coordinated, and ecological-based. A coordinated database is one where all data layers, i.e., bedrock geology, landform, soils, potential vegetation, and existing vegetation, use coincident lines. This is accomplished by an interdisciplinary team approach to mapping rather than each resource mapper working independently of each other and inputting into GIS their data layer separately. An ecological-based database consists of an integrated ecosystem classification system and mapping of ecological types that are nested within a National hierarchical framework of Ecological Units.

The EUI process is National in scope and directed by National guidelines. Forest Service Handbook 2090.11, Chapter 3, provides specific direction for conducting EUIs. This is Washington Office direction and must be used in conducting EUI by the Forest Service.

In January of 1992, Forest Service Region 5 developed a Draft Supplement to FSH 2090.11 providing specific direction on mapping procedures, processes, and format. This direction was taken from the Natural Resources Conservation Service's National Soils Handbook and was formatted to fit the EUI concept of lithology, geomorphology, soil, and potential natural community, rather than just soils.

KNF PROCESS

The following description is for the basic mapping process currently occurring on the Klamath National Forest. This process has evolved since 1992 due to changing technology, Forest needs, and budgets.

The first step is to take existing Forest bedrock and geomorphology layers and coordinate them with the existing Order 3 soils layer; using paper maps. This final product now uses the computer's capability to display these layers on the monitor's screen and changes are made directly in GIS using ARC-INFO, thus eliminating numerous chances for line error.

The next step is for the vegetation mapper to take this information into the field and describe/map potential and existing vegetation. During this mapping process, changes to soil, bedrock geology, and landform can be made. The soil scientist also makes changes to the soil, bedrock geology, and landform boundaries. Currently, we do not have a geologist available to assist in this mapping process.

When the field mapping process is completed, the vegetation mapper and soil scientist agree on the final location of polygon boundaries and ecological types. The boundaries are finalized on 1:16,000 photos and transferred directly into GIS by digitizing the lines over digital orthophotos displayed on the computer screen.

A database is constructed that connects polygons to each of the mapped data elements, such as soils, bedrock, landform, potential vegetation, and existing vegetation.

Currently, the Forest's EUI program is mapping at Order 3 intensity using a 1:24,000 scale map base. The minimum ecological map unit polygon size is approximately twenty acres. Data analysis of four completed EUI mapping projects; Main Salmon, Lower South Fork, Callahan, and Ishi Pishi/Ukonom, show 71% of the coordinated EUI polygons were 100 acres or less in size and 29% were 101-500 acres.

To date, 460,000 acres have been mapped at the Order 3 intensity.

EUI existing vegetation mapping for the northwest portion of the Lower Scott watershed on the Scott River Ranger District was performed in the following way: Vegetation polygons from the 1992 Browns/ Aubrey mapping project were attributed with additional information (i.e., series, subseries, % hardwood canopy closure, hardwood size class, previous logging, etc.) that was not captured in the original mapping. The methods used to incorporate the additional information included aerial photo interpretation, ground knowledge recollection, stand record card analysis, and ground verification. In cases where more than one category of a new attribute existed in one polygon, the polygon was split into two or more polygons to accurately map the attribute.

INDIVIDUAL EUI DATE ELEMENTS

The following discussion will provide more information for each data layer of the EUI process:

Bedrock Geology - EUI uses the recently updated (1996) Forest bedrock geology database in GIS. Major lithologic boundaries are field verified when encountered and corrections made. Lithologic units less than twenty acres are not recognized unless they are strongly contrasting or are important for management interpretation.

Geomorphology - EUI uses a combination of the draft A Classification System for Geomorphology (March 1996) which is the Forest Service's standard, in conjunction with the Forest geomorphic type coding system. The EUI currently recognizes 17 geomorphic types.

Soil - The soil survey portion of the EUI process is guided by direction from the National Soil Survey Handbook (1996), Soil Survey Manual (1993), Forest Service Handbook 2090.11 and numerous technical guidelines and support from the Natural Resources Conservation Service.

The EUI uses the existing Order 3 Soil Survey which was completed in the early 1980s and published in 1994. This survey was mapped at 1:60,000 and enlarged to 1:24,000 in GIS. During the EUI mapping process, soils are

examined more closely in the field and refined where needed.

Comparing the existing soil survey and the EUI soil survey shows that the existing soil survey used 74 soil map units to describe the soils on the west side of the Forest (west of I-5). Currently, the updated EUI soil survey uses 378 soil map units to describe soils.

Comparing the polygon size frequency distribution, shows that the existing soil survey has 37% of its polygons between 0-100 acres compared to 60% for the EUI soil survey. Also, the existing soil survey has 19% of its polygons between 501 and >2,000 acres compared to less than seven percent for the EUI soil survey. This comparison clearly shows that the EUI soil survey is much more detailed and descriptive than the existing soil survey.

Potential Vegetation - Direction and guidance for the potential vegetation (PV) component of the EUI is provided by Forest Service Manual 2060, Ecosystem Classification, Interpretation, and Application (1991), Forest Service Handbook 2090.11, Ecological Classification and Inventory Handbook (1991), Forest Inventory and Analysis User's Guide (1997), and numerous plant association field guides as well as draft plant association guides.

The EUI process at the Order 3 mapping intensity maps potential vegetation to the subseries level, which is appropriate for the mapping scale currently used.

The polygon size frequency distribution shows 71% of the PV polygons are 100 acres or less in size, 17% are 101-200 acres, and 10% are 201-500 acres in size; mean polygon size is 104 acres.

Existing Vegetation - Direction and guidance for the existing vegetation component is provided by the R5 Supplement to Forest Service Handbook 2090.11.
The existing vegetation component of the EUI was not an original part of the EUI process but was added when the users of EUI indicated that it was the most useful component of vegetation in making interpretations. The existing vegetation polygons are nested within the coordinated EUI polygons.

Comparing the EUI existing vegetation to the existing timber type existing vegetation shows that the timber type has three data identifiers; conifer/hardwood species, size class, and density class, while the EUI existing vegetation uses nine data identifiers; seral stage, conifer size class, hardwood size class, percent total vegetation cover, percent total tree cover, percent conifer cover, percent hardwood cover, primary species, and secondary species. In addition, there are designators for the presence of pre-dominant conifers (>36" dbh), and vegetative disturbance; any type of harvest, fire + salvage or fire + no salvage, included in the seral stage coding.

Comparing the polygon size frequency distribution shows 49% of the EUI existing vegetation polygons are 1-15 acres in size while 29% of the timber type polygons are 1-15 acres in size. Also, 81% of the EUI existing vegetation polygons are 1-40 acres in size, while 72% of the timber type polygons are 1-40 acres in size.

The mean polygon size for the timber type is 37 acres, and 26 acres for the EUI existing vegetation.

PEER REVIEW

The Forest's EUI Program was reviewed in 1995 as part of the Regional Office's quality control program. In attendance were Paul Johnson (acting Director for Minerals and Watershed Management), Rob Griffith (Regional Soil Scientist), Scott Miles (North Zone Soil Scientist), numerous ecologists, geologists, botanists, and other soil scientists from the Six Rivers, Shasta-Trinity, Mendocino, and Klamath National Forests.

The purpose of this Klamath Administrative Province Review was for the province EUI Teams to meet and share techniques, successes, and enhance the consistency and quality of EUI methods and products across the Province and Region.

WORK PLAN

Currently, the Klamath National Forest's EUI Program is operating under the guidance of a 1995 Landtype Ecological Unit Survey Work Plan for the Klamath National Forest Area.

Submitted: September 1997; TOM LAURENT, Soil Scientist, EUI Program Leader

Appendix I – Public Ratings of Opportunities

These are the ratings of the opportunities from interested public that attended the February 24,2000 meeting in Scott Bar. Fourteen people responded with ratings for each of the opportunities of Low, Medium, High, No, which is listed as Do Not Implement, and Not Rated, as to importance of implementing. These ratings were averaged and included in the Step 6 Opportunities Tables.

Opportunity #	Low Rating	Medium Rating	High Rating	Do not Implement	Not Rated
1	6	4	4		
2	2	6	6		
3	6	5	3		
4	2	2	10		
5	5	1	8		
6	6	8			
7	2	3	7	1	1
8	6	1	6	1	
9	8	5		1	
10	1	7	3	1	2
11	6	5	1		2
12	3	6	5		
13	2	3	9		
14	6	3	5		
15	8	4	2		
16	11	2	1		
17	8	1	4		1
18	1	1	12		1
19	2	8	4		
20	2		12		
21		4	10		
22	2		12		
23	2	3	8		1
24	4	1	8		1
25	1	6	5		2
26	1	10	2		1
27	7	4	1	1	1
28	5	7		1	1
29	7	4	1	1	1
30	10	1	1	1	1
31	6	5	1	1	1
32	11	1	1	1	1
33	12		1	1	1
34	11	1		2	
35	6	6	1	1	
36	7	5	1	1	
37	7	4	2	1	
38	6	6	1	1	
39	9	3	1	1	
40	4	7	3		
41	2	1	11		
42		5	9		
43		3	11		

Opportunity #	Low Rating	Medium Rating	High Rating	Do not Implement	Not Rated
44		7	6	1	
45	2	8	4		
46		9	5		
47		11	3		
48		10	4		
49	1	2	11		
50			14		
51			14		
52		2	10	2	
53		4	10		
54		2	12		
55		9	5		
56		6	8		
57	6	4	4		
58	4	6	4		
59	6	7	1		
60	7	4	3		
61	5	7	2		
62		4	10		

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