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## 8. Example of a HEP Application

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need to be managed to best meet Goal 1 (Figure 8-12, Block 17). If Stream Management Plan 2 is implemented, 42 acres of stream habitat would need to be managed according to the management plan to best meet Goal 1 (Figure 8-13, Block 17). The degree to which either of these plans meet Goal 1 can be determined by application of formula (3), Chapter 7. The number of HU's gained through compensation for an evaluation species, the  $M_i$  in formula (3), is obtained by multiplying the value in Column 7, Form H, by the ratio of the compensation requirement (Form H, Block 17) divided by the size of the management area (Form H, Block 4). The application of formula (3), to data presented in Figures 8-12 and 8-13, results in a value of 35 for Stream Management Plan 1 and a value of 7 for Stream Management Plan 2. These values indicate that Stream Management Plan 2 best meets the management goal of in-kind compensation because the value of 7 is closer to zero than is the value of 35.

- B. Goal 2. Equal replacement. This goal specifies that the gain of one AAHU can be used to offset the loss of one AAHU for any evaluation species. Relative Value Indices are not required for these analyses. Prior completion of Form B is required for both the proposed action and the management plans.

Stream Management Plan 3 was designed to meet Goal 2. Evaluation species with either gains or losses in AAHU's, as a result of implementation of the proposed action, are listed on Form H (Figure 8-14). Analyzing these data with the use of Form H results in the determination that the management of 33.5 acres (Block 17, Figure 8-14) would be required to fully meet Goal 2.

- C. Goal 3. Relative replacement. Relative replacement makes use of RVI's to determine the relative values of evaluation species for compensation (see Chapter 7). Reservoir Management Plan 1 was designed to compensate for losses of stream habitat by management of smallmouth bass habitat in the reservoir by control of water levels during the spawning season. A Form D is needed for Reservoir Management Plan 1, in addition to Forms B, C, and D for the proposed action. Note that Columns 4a and 4b of Form D (Figure 8-15) lack data for certain species because the HSI models used for those species were unable to detect changes in HSI as a result of the implementation of the management plan. In such circumstances, it is unnecessary to complete Form B and C for the management plan for those evaluation species.

Reservoir Management Plan 1 was developed to meet the goal of relative replacement; therefore RVI's must be determined for the evaluation species by use of Forms E and F (Figures 8-16 and 8-17, respectively). The RVI's from Form F (Figure 8-17) are entered on Form G-1 for both the proposed action and management plan (Figures 8-18 and 8-19) to adjust the AAHU's data to accommodate socioeconomic and environmental considerations. After the AAHU's have been adjusted, they no longer directly represent carrying capacity.





8. Example of a HEP Application

1. Study										
EXAMPLE - (Aquatic only)										
2. Ranking criteria	3. Ranking criteria							4. Sum	6. Relative weight	
	(1)	(2)	(3)	(4)	(5)	(6)	Dummy			
(1) Regional scarcity	XXXXX	1.0	1.0	1.0	1.0			1.0	5.0	0.333
(2) Vulnerability	0.0	XXXXX	0.5	1.0	1.0			1.0	3.5	0.233
(3) Replaceability	0.0	0.5	XXXXX	1.0	1.0			1.0	3.5	0.233
(4) Aesthetic value	0.0	0.0	0.0	XXXXX	0.0			1.0	1.0	0.067
(5) Management efforts	0.0	0.0	0.0	1.0	XXXXX			1.0	2.0	0.133
(6)						XXXXX		1.0		
Dummy criteria	0	0	0	0	0	0	XXXXX		0.0	0.00
								5. Total	7. Total weight	
								15.0	0.999	

Figure 8-16. Example ranking of RVI criteria for aquatic Evaluation Species. (Form E)

8. Example of a HEP Application

1. Study								
EXAMPLE								
2. Evaluation species	3. Relative weight of ranking criteria					5. Relative value	6. Relative Value Index	
	1	2	3	4	5			6
	0.333	0.233	0.233	0.067	0.133			
		4. Relative importance of each ranking criterion to each evaluation species.						
Spotfin shiner	0.5	0.2	0.1	0.1	0.1			
<b>Product</b>	0.167	0.047	0.023	0.007	0.013	0.257	0.257	
Channel catfish	0.4	0.6	0.5	0.2	0.7			
<b>Product</b>	0.133	0.14	0.117	0.013	0.093	0.496	0.496	
Lepomis spp.	0.1	0.1	0.3	0.4	0.4			
<b>Product</b>	0.033	0.023	0.07	0.027	0.053	0.206	0.206	
Smallmouth bass (stream)	1.0	1.0	1.0	1.0	1.0			
<b>Product</b>	0.333	0.233	0.233	0.067	0.133	0.999	1.0	
Smallmouth bass (reservoir)	0.3	0.3	0.2	0.2	0.5			
<b>Product</b>	0.1	0.07	0.047	0.013	0.067	0.297	0.297	
<b>Product</b>								
<b>Product</b>								
<b>Product</b>								

Figure 8-17. Determination of RVI's for aquatic Evaluation Species. (Form F)





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### 8. Example of a HEP Application

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The data developed in Form G-1 are then entered on Form H (Figure 8-20) to determine compensation. Note that in this proposed compensation plan, all evaluation species AAHU's lost in the stream are compensated by a gain in smallmouth bass (reservoir) AAHU's at a rate adjusted by the Relative Value Indices. Data developed by use of Form H for Reservoir Management Plan 1 indicate that a reservoir of 1,912 acres would need to be managed, according to the management plan, to compensate for losses of habitat for all evaluation species. Other management plans for the reservoir could increase or decrease the acreage required for management, or the user may determine that 100% compensation is not required. The final evaluation of the plan should reflect these considerations.

The examples in this chapter only provide an analysis of how "good" a selected plan is, based on a certain set of assumptions, and how many acres of habitat are needed to best meet the compensation goal. Use of HEP requires that the assumptions be stated. Final choice of compensation goals would depend on socioeconomic, environmental, and administrative considerations inherent to each proposed action.

