Decision Making in an Uncertain Environment

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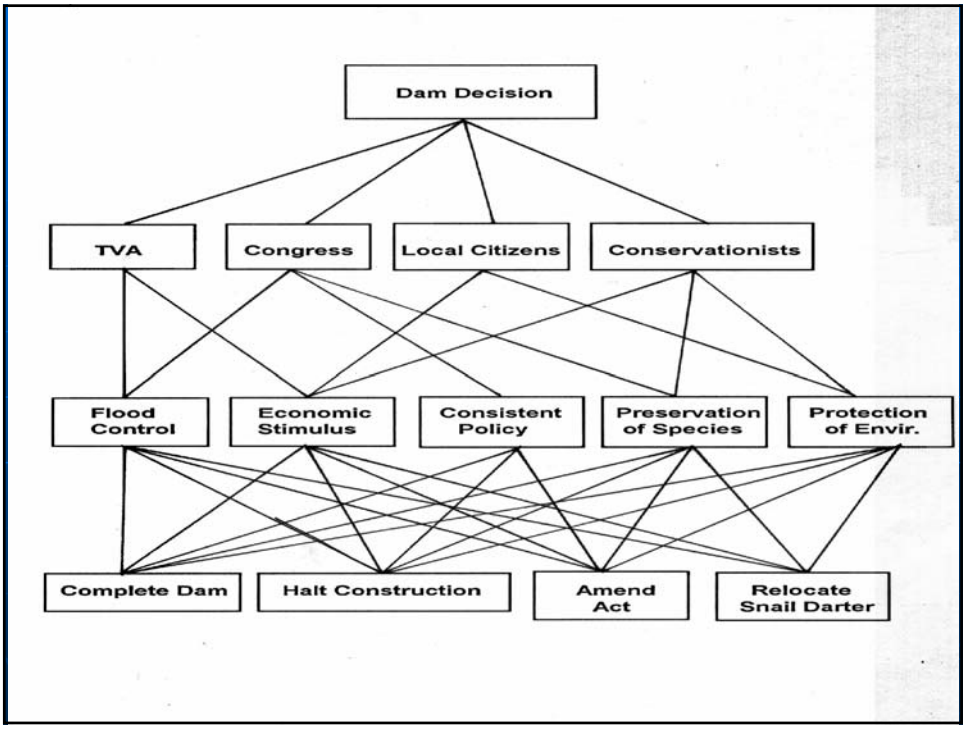


Example of 4-level Hierarchy

Objective:	what to achieve
Actors:	how actors meet the objective
Criteria:	how criteria influence actors
Activities:	how activities impact criteria

Application of AHP

4-level hierarchy
In level 2 there are four actors
In level 3 there are five criteria
In level 4 there are four activities

Note that all boxes are not connected to all boxes above

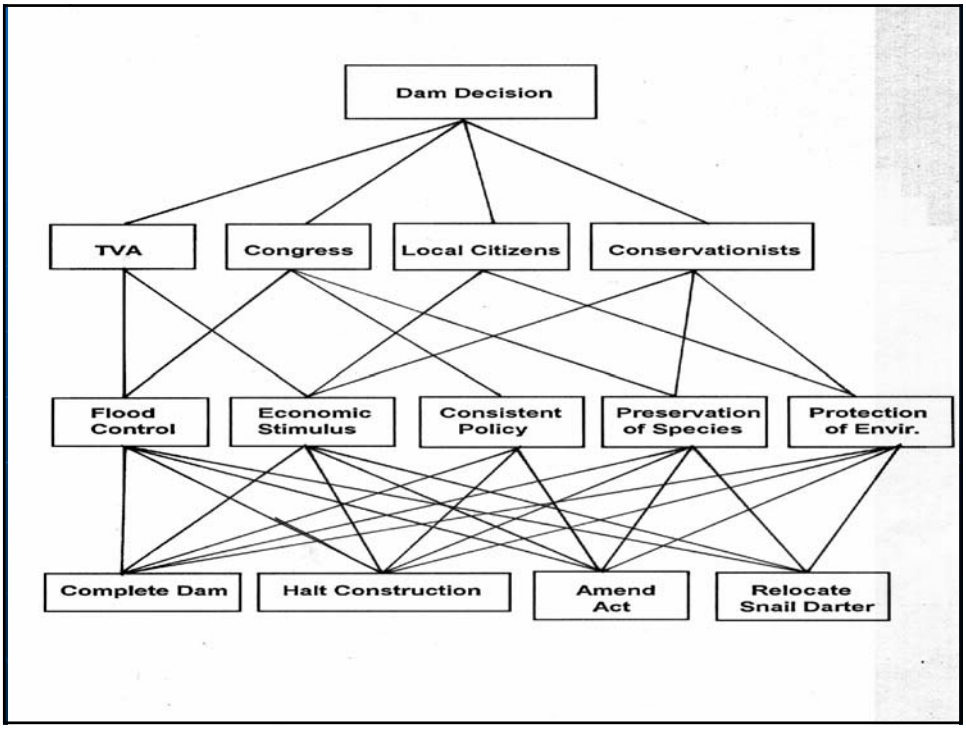
Level 2 matrix displaying pair-wise comparisons

	TVA	Congress	Local Citizens	Conserva-tionists
TVA	1	¼	½	1
Cong.	4	1	2	3
L.C.	2	½	1	2
Cons.	1	1/3	½	1

Actors' Influence on the Objective

Weights

TVA:	0.1281
Congress:	0.4778
Local citizens:	0.2561
Conservationists:	0.1380



Level 3 Relationships

Note that all four actors are not influenced by all five criteria in level 3. Some are linked to only two and others to three.

Therefore there will be four matrices of different sizes in level 3, ranging from 2x2 to 3x3.

Matrix 1 in Level 3

In the eyes of TVA how important are Flood Control (FC) and Economic Stimulus (ES)

	Flood Control	Economic Stimulus
Flood Control	1	2
Economic Stimulus	½	1

Flood Control vs. Economic Stimulus w.r.t. TVA

Weights

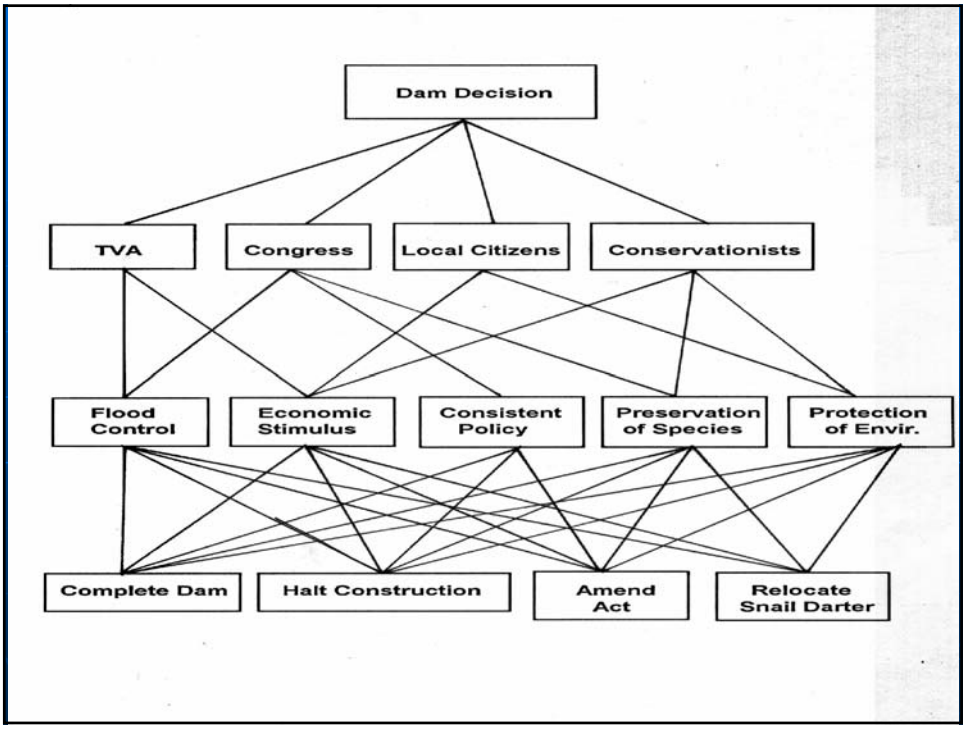
Flood Control: 0.667

Economic Stimulus: 0.333

Matrix 2 in Level 3

In the eyes of Congress how important are Flood Control (FC), Consistent Policy (CP) and Preservation of Species (PS)

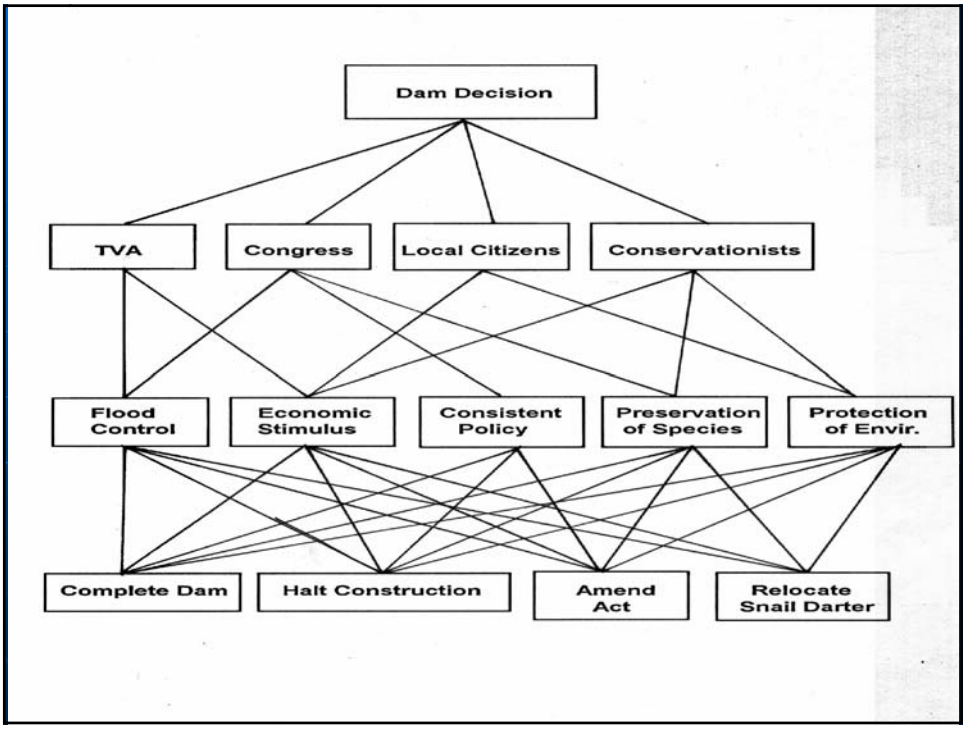
	Flood Control	Consist. Policy	Preserv. of Species
FC	1	2	1/3
CP	1/2	1	1/2
PS	3	2	1



Matrix 3 in Level 3

In the eyes of Local Citizens how important are Economic Stimulus (ES) and Protection of the Environment (PE)

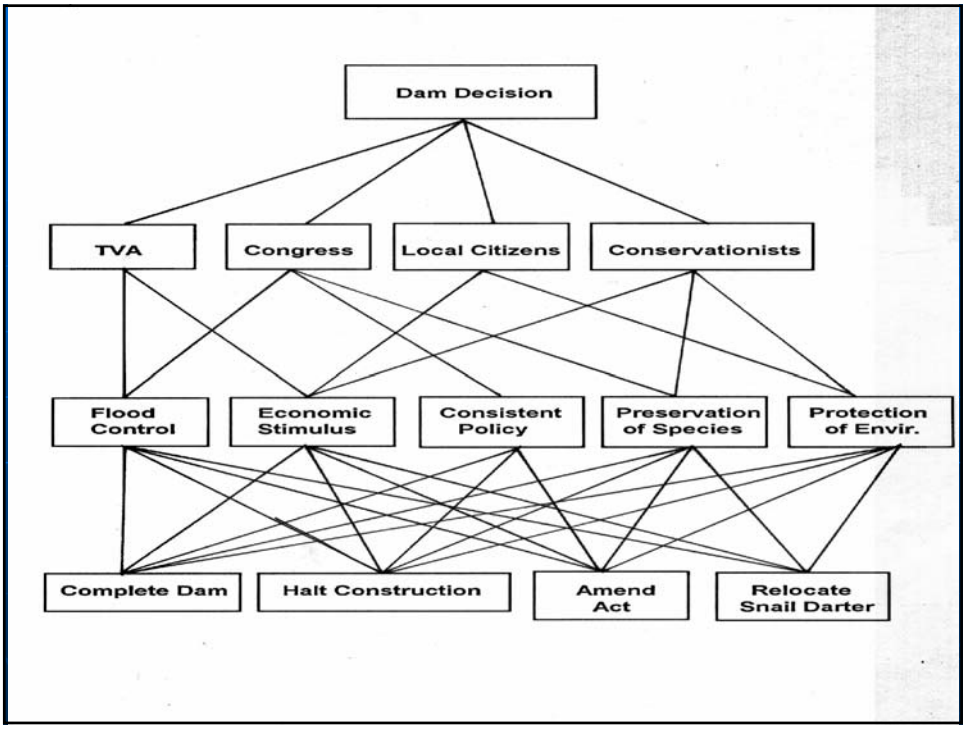
	Economic Stimulus	Protection of Environment
Economic Stimulus	1	4
Protection of Environment	1/4	1



Criteria's Influence on Actors

Weights

Flood Control:	0.2111
Economic Stimulus:	0.2599
Consistent Policy:	0.0906
Preservation of Species:	0.3061
Protection of Environment:	0.1323



Matrix 4 in Level 3

In the eyes of Conservationists how important are ES, PS and PE

	Economic Stimulus	Preserv. of Species	Protect. of Environment
ES	1	¼	1/6
PS	4	1	1/2
PE	6	2	1

Level 4 Relationships

Note that all five criteria are not influenced by all four activities in level 4. Some are linked to only three and others to four.

Therefore there will be five matrices of different sizes in level 4, ranging from 3x3 to 4x4.

Matrix 1 in Level 4

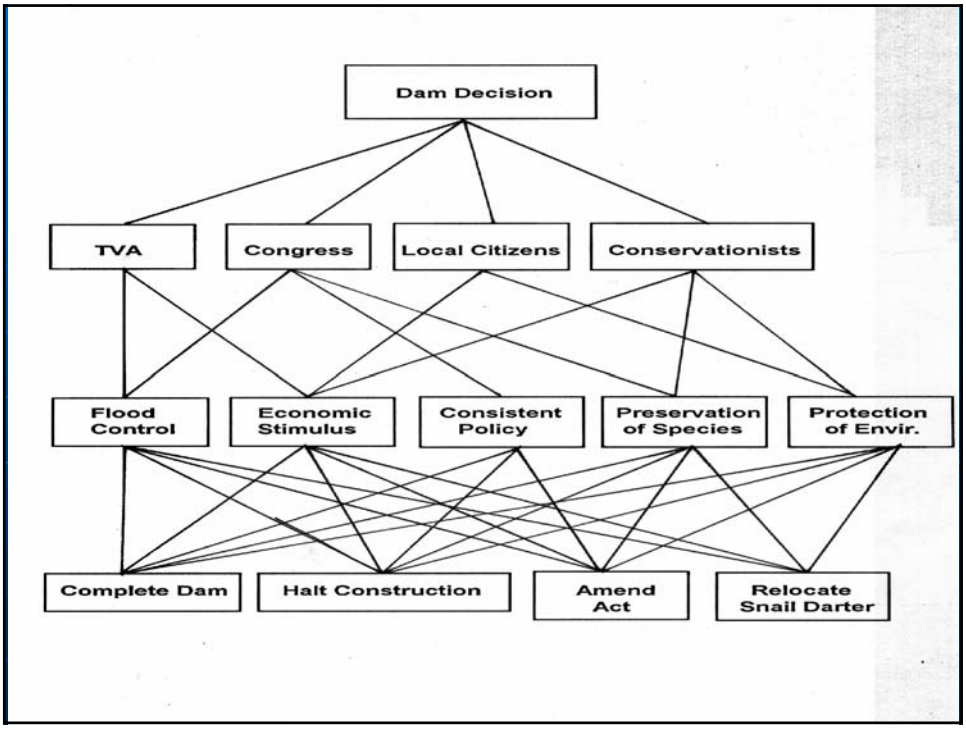
With respect to Flood Control, how important are: CD, HC, AA, RS

	Complete Dam	Halt Construct.	Amend Act	Relocate Snail Darter
CD	1	9	5	6
HC	1/9	1	¼	1/3
AA	1/5	4	1	½
RS	1/6	3	2	1

Matrix 2 in Level 4

With respect to Economic Stimulus, how important are CD, HC, AA, RS

	Complete Dam	Halt Construct.	Amend Act	Relocate Snail Darter
CD	1	8	5	5
HC	1/8	1	¼	1/5
AA	1/5	4	1	1/3
RS	1/5	5	3	1



Matrix 3 in Level 4

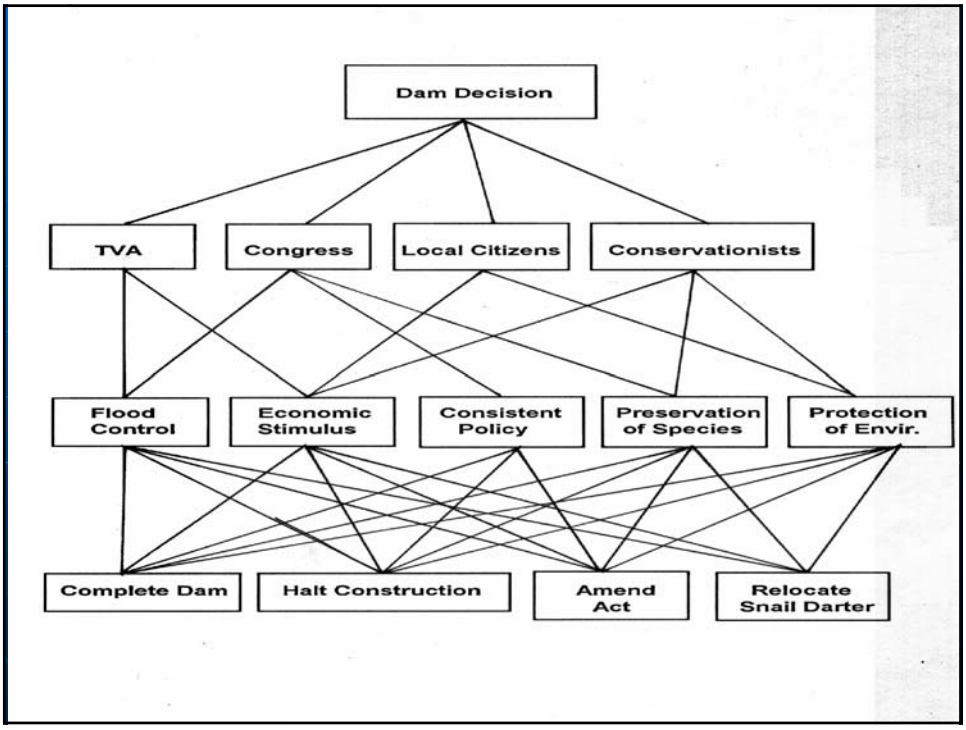
With respect to Consistent Policy how important are: CD, HC and AA

	Complete Dam	Halt Construct.	Amend Act
CD	1	1/3	¼
HC	3	1	3
AA	4	1/3	1

Matrix 4 in Level 4

With respect to Preserv. Of Species, how important are CD, HC, AA, RS

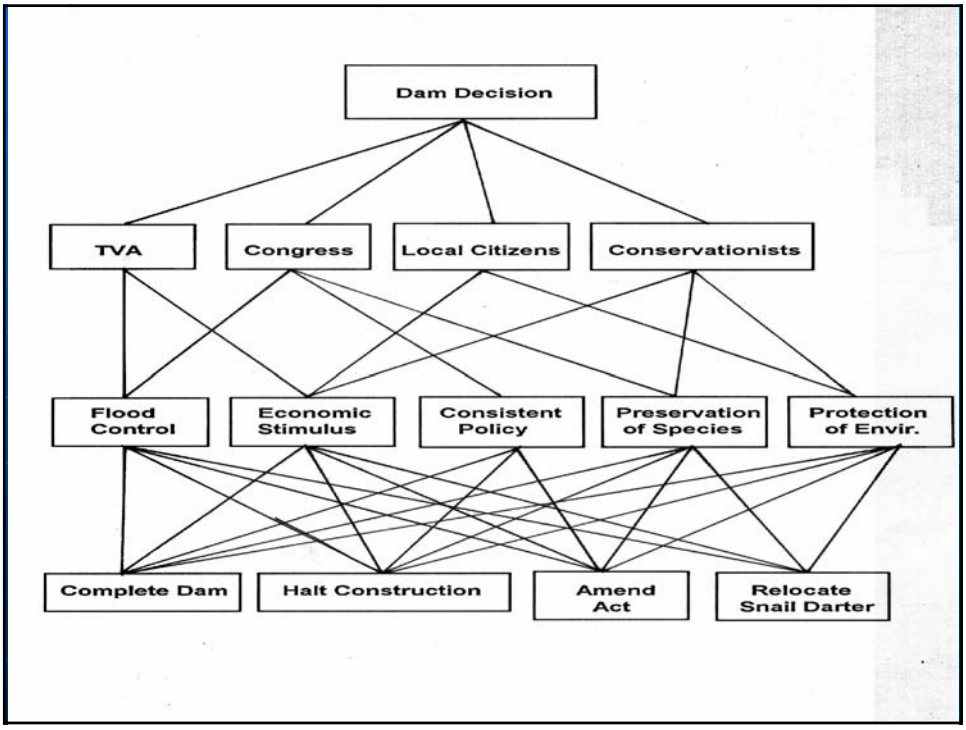
	Complete Dam	Halt Construct.	Amend Act	Relocate Snail Darter
CD	1	1/7	1/5	1/8
HC	7	1	3	1/3
AA	5	1/3	1	1/5
RS	8	3	5	1



Matrix 5 in Level 4

With respect to Protect. Of Environ., how important are CD, HC, AA, RS

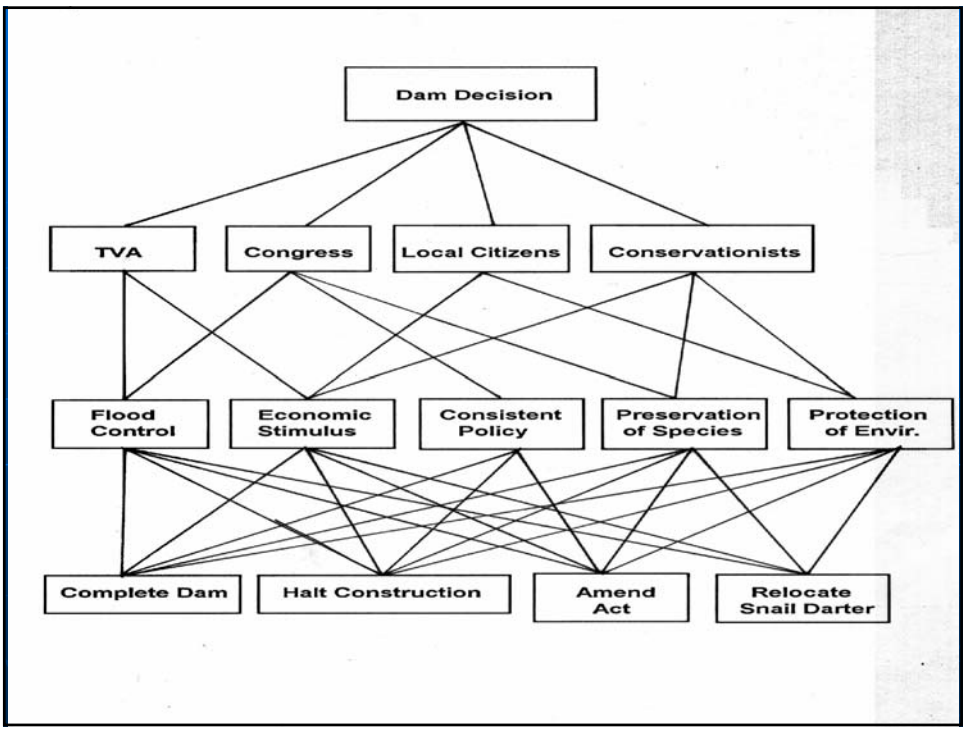
	Complete Dam	Halt Construct.	Amend Act	Relocate Snail Darter
CD	1	1/5	1/6	1/8
HC	5	1	1/3	½
AA	6	3	1	3
RS	8	2	1/3	1



Composite Priority

Weights

Complete Dam:	0.3301
Halt Construction:	0.1799
Amend Act:	0.1916
Relocate Snail Darter:	0.2983



Overall Results

- Completion of Dam and Relocating the Snail Darter have comparable weights.
- These two decisions have the most impact, and the other two decisions - Halting of Construction and Amending the Endangered Species Act are less important in their judgment.
- So either complete the Dam as planned, or move the fish and then complete the Dam. For the second option, more financial and environmental analysis will be needed.