



US Forest Service's National BMP Program

Scoring and Rating System for BMP Implementation, Effectiveness and Overall Results

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Rating System Purpose



Provide a method to ...

- **measure Forest Service performance in applying BMPs and protecting water quality and aquatic habitat**
- **track BMP performance over time at multiple scales**
- **identify patterns in BMP implementation and BMP effectiveness that indicate needed changes to improve BMP implementation or effectiveness**



Rating System Assumptions



Each monitoring protocol ...

- **evaluates more than one National Core BMP**
- **evaluates outcomes of BMP implementation regardless of the site-specific BMP prescription used**
- **obtains objective information on BMP implementation and effectiveness at a site**
- **infers water quality impacts from visual evidence of pollutant movement and changes to waterbody morphology**
- **does not attempt to determine attainment of water quality standards**



How Ratings are Determined



For each monitoring protocol ...

- **implementation and effectiveness are rated separately and then combined for an overall BMP performance rating for a site**
- **a unique ruleset assigns the ratings based on the combination of answer choices selected in the BMP evaluation**
- **the data management system is programmed with the protocol ruleset**
- **the ruleset was tested and validated**



BMP Implementation Rating



Were site-specific BMP prescriptions implemented as planned or designed?

Implementation Rating	Interpretation
Fully Implemented	Prescriptions are identified in project planning documents, <u>All</u> prescriptions are translated into action documents, <u>All</u> specified prescriptions are implemented fully, and <u>All</u> necessary corrective actions identified during the project are implemented fully.
Mostly Implemented	Prescriptions are identified in project planning documents, <u>Some</u> prescriptions are translated into action documents, <u>All</u> specified prescriptions are implemented fully, and <u>All</u> or <u>Some</u> necessary corrective actions identified during the project are implemented fully.
Marginally Implemented	Prescriptions are identified in project planning documents, <u>All</u> or <u>Some</u> prescriptions are translated into action documents, and <u>Some</u> specified prescriptions are implemented fully, and <u>All</u> or <u>Some</u> necessary corrective actions identified during the project are implemented fully.
Not Implemented	Prescriptions are identified in project planning documents, <u>No</u> prescriptions are translated into action documents, or <u>No</u> specified prescriptions are implemented fully, or <u>No</u> necessary corrective actions identified during the project are implemented.
No BMPs	Site-specific BMP prescriptions were not developed or identified during project planning.



BMP Implementation Rating



Were site-specific BMP prescriptions implemented as planned or designed?

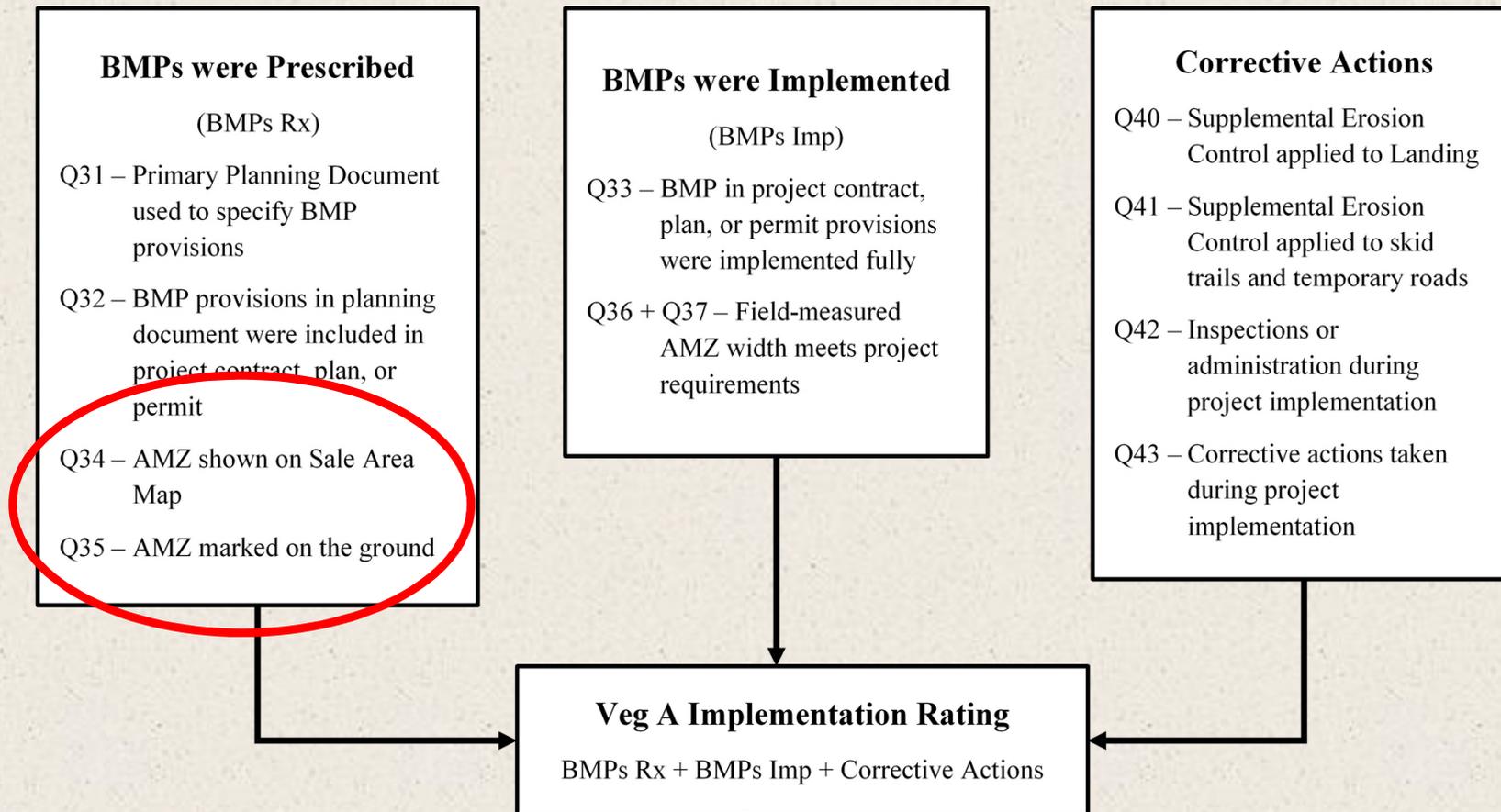
Implementation Rating	Interpretation
Fully Implemented	BMPs were implemented
Mostly Implemented	
Marginally Implemented	BMPs were not implemented
Not Implemented	
No BMPs	BMP Process was not followed



BMP Implementation Rating Ruleset



Veg A - Ground-Based Skidding and Harvesting Implementation Rating



BMP Implementation Rating Ruleset



Answer Choice	Q34. Was the AMZ shown on the Sale Area Map?	Interpretation
"a"	Not applicable, the waterbody does not have a designated AMZ width	Not applicable
"b"	Yes	BMPs were prescribed
"c"	No	BMPs were not prescribed

Answer Choice	Q35. Was the AMZ marked on the ground?	Interpretation
"a"	Not applicable, the contract or plan did not require the AMZ to be marked on the ground	Not applicable
"b"	Yes	BMPs were prescribed
"c"	No	BMPs were not prescribed

Q34 + Q35 Rating	Answer Choice Combinations	Interpretation
All	Q34 is "b" <u>AND</u> Q35 is "a" or "b"	All AMZ BMPs were prescribed
Some	Q34 is "b" <u>AND</u> Q35 is "c" Q34 is "c" <u>AND</u> Q35 is "b"	Some AMZ BMPs were prescribed
None	Q34 is "c" <u>AND</u> Q35 is "c"	None of the AMZ BMPs were prescribed
Not Applicable	Q34 is "a" <u>AND</u> Q35 is skipped	No AMZ was necessary



BMP Implementation Rating Ruleset



BMPs were Prescribed

(BMPs Rx)

Q31 – Primary Planning Document used to specify BMP provisions

Q32 – BMP provisions in planning document were included in project contract, plan, or permit

Q34 – AMZ shown on Sale Area Map

Q35 – AMZ marked on the ground

BMPs Rx Rating	Question Rating Combinations		
	Q31	Q32	Q34 + Q35
All	Planning Document Exists	All	NA <u>OR</u> All
	Planning Document Exists	All	Some <u>OR</u> None
	Planning Document Exists	Some	NA, All, Some <u>OR</u> None
Some	Planning Document Exists	None	All <u>OR</u> Some
	Planning Document Exists	None	NA <u>OR</u> None
	Planning Document Exists	None	NA, All, Some <u>OR</u> None
None	No Planning Document Exists	Skipped	NA, All, Some <u>OR</u> None
	No Planning Document Exists	Skipped	NA, All, Some <u>OR</u> None
	No Planning Document Exists	Skipped	NA, All, Some <u>OR</u> None
No BMPs	No Planning Document Exists	Skipped	NA, All, Some <u>OR</u> None
	No Planning Document Exists	Skipped	NA, All, Some <u>OR</u> None
	No Planning Document Exists	Skipped	NA, All, Some <u>OR</u> None
No BMPs Rx	Planning Document Exists	No BMPs Rx	NA, All, Some <u>OR</u> None
	Planning Document Exists	No BMPs Rx	NA, All, Some <u>OR</u> None
	Planning Document Exists	No BMPs Rx	NA, All, Some <u>OR</u> None

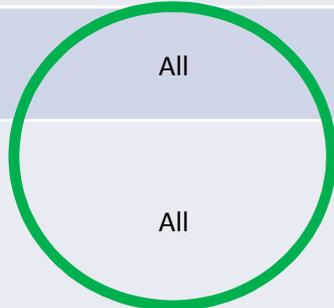
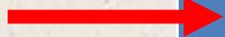
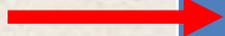


BMP Implementation Rating Ruleset



Veg A - Ground-Based Skidding and Harvesting Implementation Rating

Veg A Implementation Rating	Group Rating Combinations		
	BMPs Rx	BMPs Imp	Corrective Actions
Fully Implemented (all are true)	All	All	All
Mostly Implemented (all are true)	All	All	Some
	Some	All	All <u>OR</u> Some
Marginally Implemented (all are true)	All <u>OR</u> Some	Some	All <u>OR</u> Some
Not Implemented (any one is true)	None <u>OR</u> No BMPs Rx	None	None
No BMPs	No BMPs		



BMP Effectiveness Rating



Were the site-specific BMP prescriptions, as implemented effective at controlling nonpoint source pollution and protecting aquatic health?

Effectiveness Rating	Interpretation	
Effective	<p><u>No</u> pollutants reached in the water and there is no potential threat evident</p> <p>--and--</p> <p><u>No</u> adverse effects to waterbody from the project or activity (e.g. physical disturbance)</p>	
Mostly Effective	<p><u>Minor</u> amounts of pollutants reached the waterbody or there is a <u>potential threat</u> evident</p> <p>--and/or--</p> <p>Waterbody received <u>minor</u> adverse effects from the project or activity</p> <p>--and--</p> <p>Impacts to water quality are <u>temporary</u>, lasting less than one year</p>	
Marginally Effective	<p><u>Minor</u> amounts of pollutants reached the waterbody or there is a <u>potential threat</u> evident</p> <p>--and/or--</p> <p>Waterbody received <u>minor</u> adverse effects from the project or activity</p> <p>--and--</p> <p>Impacts to water quality are <u>prolonged</u>, lasting more than one year</p>	<p><u>Major</u> amounts of pollutants reached the waterbody or there is a <u>potential threat</u> evident</p> <p>--and/or--</p> <p>Waterbody received <u>major</u> adverse effects from the project or activity</p> <p>--and--</p> <p>Impacts to water quality are <u>temporary</u>, lasting less than one year</p>
Not Effective	<p><u>Major</u> amounts of pollutants reached the waterbody or are very close to entering the waterbody</p> <p>--or--</p> <p>Waterbody received <u>major</u> adverse effects from the project or activity</p> <p>--and--</p> <p>Impacts to water quality are <u>prolonged</u>, lasting more than one year</p>	

Effective = No impacts

Mostly Effective = minor and temporary effects

Marginally Effective = minor and prolonged effects OR major and temporary effects

Not Effective = major and prolonged effects



BMP Effectiveness Rating



Were the site-specific BMP prescriptions, as implemented effective at controlling nonpoint source pollution and protecting aquatic health?

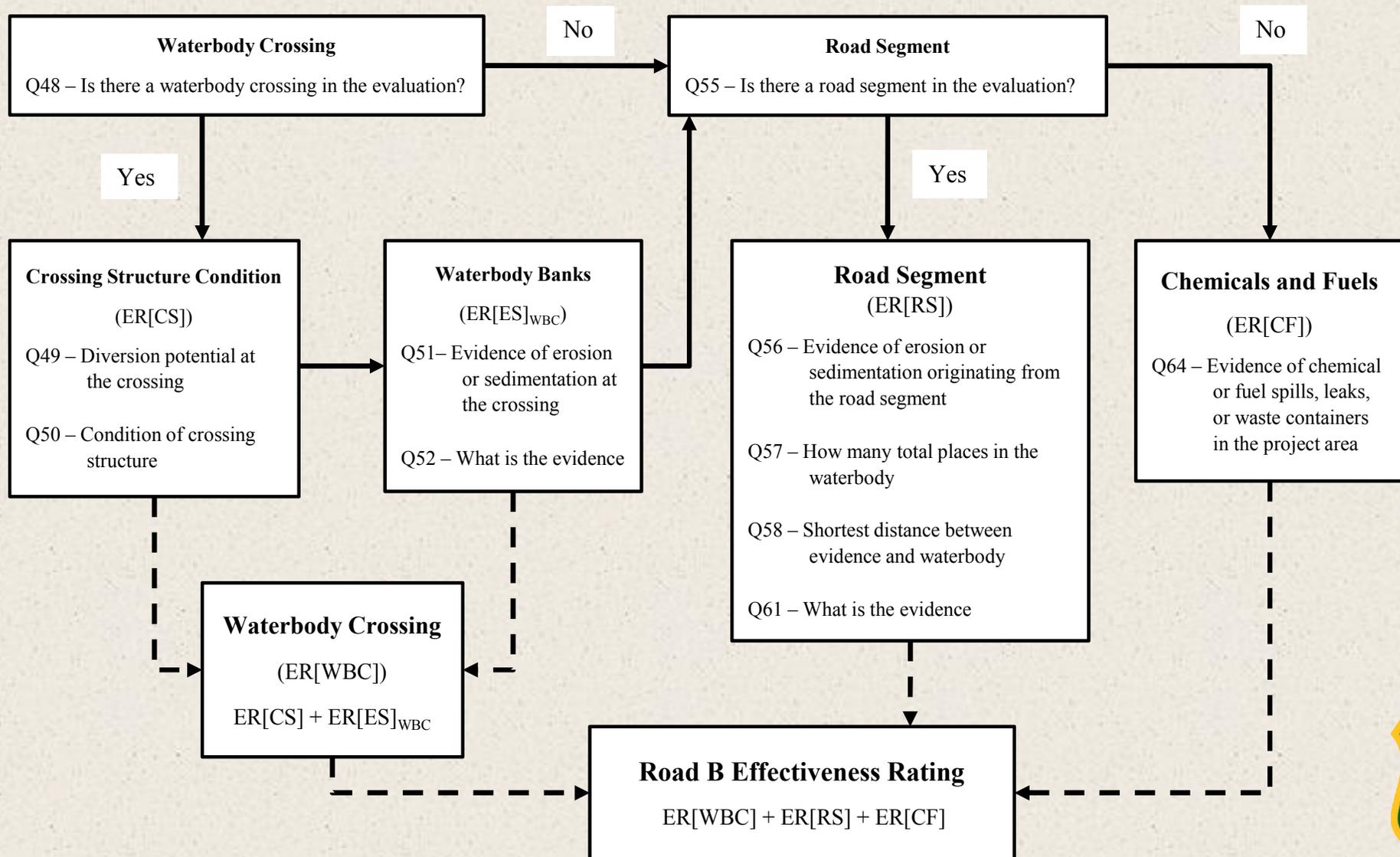
Effectiveness Rating	Interpretation
Effective	BMPs were Effective
Mostly Effective	
Marginally Effective	BMPs were not Effective
Not Effective	



BMP Effectiveness Rating Ruleset



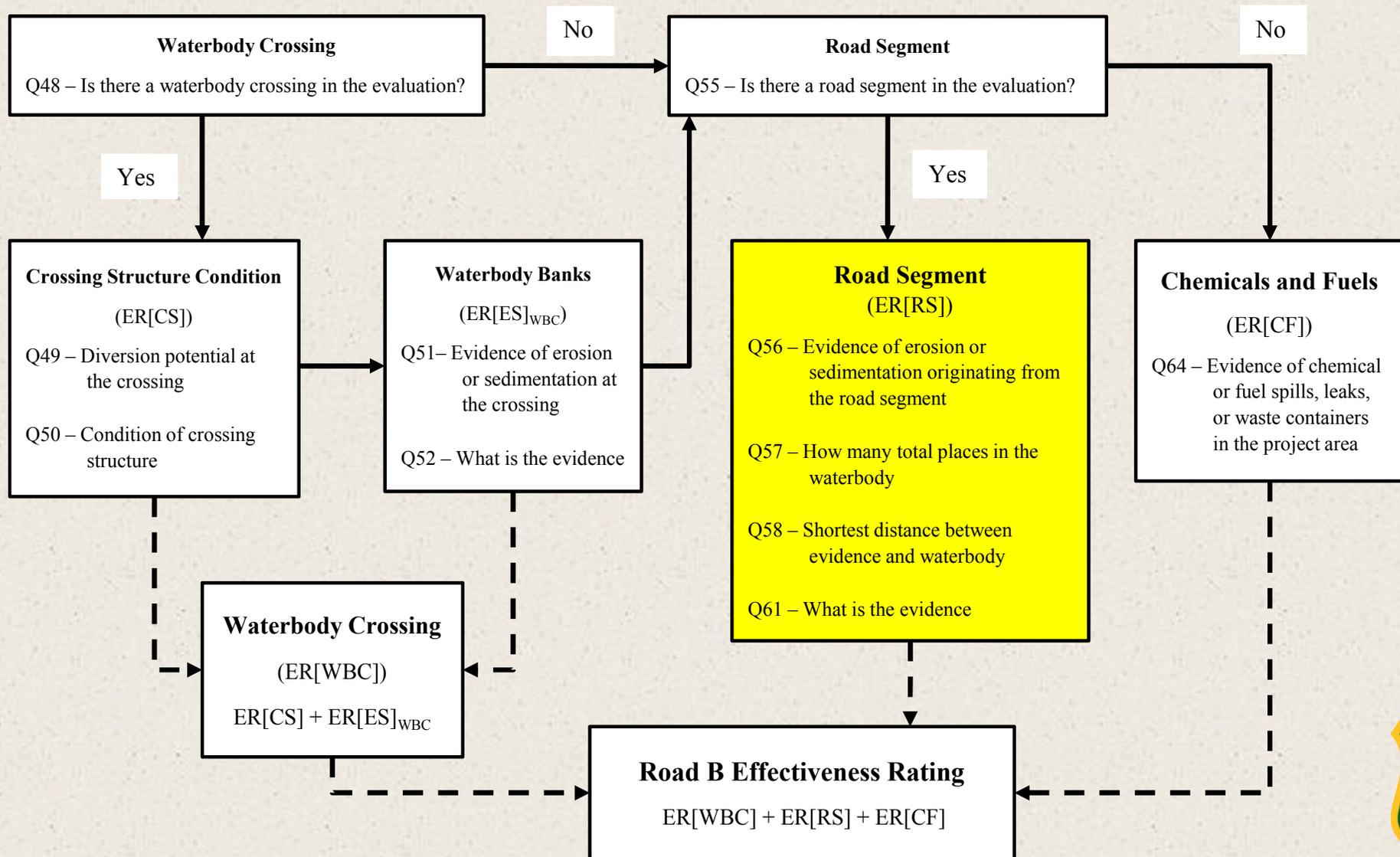
Road B – Completed Road or Waterbody Crossing Construction or Reconstruction Effectiveness Rating



BMP Effectiveness Rating Ruleset



Road B – Completed Road or Waterbody Crossing Construction or Reconstruction Effectiveness Rating



BMP Effectiveness Rating Ruleset



Road Segment (ER[RS])

Q56 – Evidence of erosion or sedimentation originating from the road segment

Q57 – How many total places in the waterbody

Q58 – Shortest distance between evidence and waterbody

Q61 – What is the evidence

Answer Choice	Q58. What is the shortest distance between the evidence and the waterbody?	Interpretation	Rating
"a"	≤ 10 feet	High potential for pollutant to reach waterbody	NE
"b"	> 10 to 50 feet	Relatively high potential for pollutant to reach waterbody	MaE
"c"	> 50 to 100 feet	Relatively low potential for pollutant to reach waterbody	MoE
"d"	> 100 feet	Low potential for pollutant to reach waterbody	E

Answer Choice	Q61. For all of the occurrences of erosion and sedimentation observed in the area identified in Q56, what is the evidence? Select all that apply.	Weight
"a"	Traceable evidence to waterbody but not visible in waterbody	3
"b"	Turbidity present	3
"c"	Evidence of localized sediment deposition	3
"d"	Changes to substrate composition	3
"e"	Changes to waterbody geometry	3
"f"	Bank instability	3
"g"	Bank trampling or compaction	1
"h"	Vegetation damage or bare ground	1
"i"	Sheet erosion	1
"j"	Rill erosion	1
"k"	Gully erosion	5
"l"	Headcutting	5
"m"	Slumping or slips	5

Sum of Q61 answer choices selected	Interpretation	Q61 Rating
0 – 2	No potential threat	NPT
3 – 4	Potential threat	PT
≥ 5	Major potential threat	MPT



BMP Effectiveness Rating Ruleset



ER[RS]	Q56	Q57	Q58	Q61
No Road Segment	Skipped	Skipped	Skipped	Skipped
Effective	No evidence (E)	Skipped	Skipped > 100 ft (E)	Skipped
	Outside Waterbody (ME)	Skipped	OR > 50 to 100 ft (MoE)	NPT or PT
	Outside Waterbody (ME)	Skipped	> 10 to 50 ft (MaE)	NPT
Mostly Effective	Outside Waterbody (ME)	Skipped	> 10 to 50 ft (MaE)	PT
	Outside Waterbody (ME)	Skipped	≤ 10 ft (NE)	NPT
	In waterbody (NE)	1 or 2 (E)	Skipped	NPT
Marginally Effective	Outside Waterbody (ME)	Skipped	≤ 10 ft (NE)	PT
	Outside Waterbody (ME)	Skipped	> 100 ft (E) OR > 50 to 100 ft (MoE)	MPT
	In waterbody (NE)	1 or 2 (E)	Skipped	PT
	In waterbody (NE)	3 or 4 (ME)	Skipped	NPT
Not Effective	Outside Waterbody (ME)	Skipped	> 10 to 50 ft (MaE) OR ≤ 10 ft (NE)	MPT
	In waterbody (NE)	1 or 2 (E)	Skipped	MPT
	In waterbody (NE)	3 or 4 (ME)	Skipped	PT or MPT
	In waterbody (NE)	5 or more (NE)	Skipped	NPT, PT, or MPT

Road Segment (ER[RS])

Q56 – Evidence of erosion or sedimentation originating from the road segment

Q57 – How many total places in the waterbody

Q58 – Shortest distance between evidence and waterbody

Q61 – What is the evidence



BMP Effectiveness Rating Ruleset



ER[RS]	Q56	Q57	Q58	Q61
No Road Segment	Skipped	Skipped	Skipped	Skipped
Effective	No evidence (E)	Skipped	Skipped	Skipped
	Outside Waterbody (ME)	Skipped	> 100 ft (E) OR > 50 to 100 ft (MoE)	NPT or PT
	Outside Waterbody (ME)	Skipped	> 10 to 50 ft (MaE)	NPT
Mostly Effective	Outside Waterbody (ME)	Skipped	> 10 to 50 ft (MaE)	PT
	Outside Waterbody (ME)	Skipped	≤ 10 ft (NE)	NPT
	In waterbody (NE)	1 or 2 (E)	Skipped	NPT
Marginally Effective	Outside Waterbody (ME)	Skipped	≤ 10 ft (NE)	PT
	Outside Waterbody (ME)	Skipped	> 100 ft (E) OR > 50 to 100 ft (MoE)	MPT
	In waterbody (NE)	1 or 2 (E)	Skipped	PT
	In waterbody (NE)	3 or 4 (ME)	Skipped	NPT
Not Effective	Outside Waterbody (ME)	Skipped	> 10 to 50 ft (MaE) OR ≤ 10 ft (NE)	MPT
	In waterbody (NE)	1 or 2 (E)	Skipped	MPT
	In waterbody (NE)	3 or 4 (ME)	Skipped	PT or MPT
	In waterbody (NE)	5 or more (NE)	Skipped	NPT, PT, or MPT

Road Segment (ER[RS])

Q56 – Evidence of erosion or sedimentation originating from the road segment

Q57 – How many total places in the waterbody

Q58 – Shortest distance between evidence and waterbody

Q61 – What is the evidence

Interpretation:

Some evidence of erosion was observed, consisting of a combination of sheet or rill erosion, vegetation damage or bare soils, located more than 50 feet from the waterbody

Rating: Effective



BMP Effectiveness Rating Ruleset



ER[RS]	Q56	Q57	Q58	Q61
No Road Segment	Skipped	Skipped	Skipped	Skipped
Effective	No evidence (E)	Skipped	Skipped > 100 ft (E)	Skipped
	Outside Waterbody (ME)	Skipped	OR > 50 to 100 ft (MoE)	NPT or PT
	Outside Waterbody (ME)	Skipped	> 10 to 50 ft (MaE)	NPT
Mostly Effective	Outside Waterbody (ME)	Skipped	> 10 to 50 ft (MaE)	PT
	Outside Waterbody (ME)	Skipped	≤ 10 ft (NE)	NPT
	In waterbody (NE)	1 or 2 (E)	Skipped	NPT
Marginally Effective	Outside Waterbody (ME)	Skipped	≤ 10 ft (NE)	PT
	Outside Waterbody (ME)	Skipped	> 100 ft (E) OR > 50 to 100 ft (MoE)	MPT
	In waterbody (NE)	1 or 2 (E)	Skipped	PT
	In waterbody (NE)	3 or 4 (ME)	Skipped	NPT
Not Effective	Outside Waterbody (ME)	Skipped	> 10 to 50 ft (MaE) OR ≤ 10 ft (NE)	MPT
	In waterbody (NE)	1 or 2 (E)	Skipped	MPT
	In waterbody (NE)	3 or 4 (ME)	Skipped	PT or MPT
	In waterbody (NE)	5 or more (NE)	Skipped	NPT, PT, or MPT

Road Segment (ER[RS])

Q56 – Evidence of erosion or sedimentation originating from the road segment

Q57 – How many total places in the waterbody

Q58 – Shortest distance between evidence and waterbody

Q61 – What is the evidence

Interpretation:

Some evidence of erosion was observed, consisting of a combination of sheet or rill erosion, vegetation damage or bare soils, located less than 10 feet from the waterbody

Rating: Marginally Effective



BMP Effectiveness Rating Ruleset



If you are not sampling water quality or water chemistry, how can you say the BMPs are effective?

If the information is available, it is used in the rating determination, but sampling is not required.

**Flow Diversion
(ER[FD])**

Q46 – Control of water flow through disturbance area

Q47 – Violation of turbidity standard

Q48 – Violation of sediment standard

Answer choice	Did flow diversion, lack of flow diversion, or poorly functioning diversion cause a violation of the water quality standard for Q47. turbidity? Q48. sediment?	Interpretation	Q47 or Q48 Rating
Q46 is "a" or "b"	Not applicable	Not applicable	Skipped
"a"	Not applicable, no water quality standard for turbidity/sediment	Standard was not violated	E
"b"	Yes	Standard was violated	NE
"c"	No	Standard was not violated	E
"d"	Don't know, didn't measure turbidity/sediment	Uncertain whether standard was violated	NA



BMP Effectiveness Rating Ruleset



Road B Effectiveness Rating	ER[WBC]	ER[RS]	ER[CF]
Effective (all are true)	No Waterbody Crossing <u>OR</u> Effective	No Road Segment <u>OR</u> Effective	Effective
Mostly Effective (all in each line are true)	Mostly Effective	No Road Segment <u>OR</u> Effective <u>OR</u> Mostly Effective	Effective <u>OR</u> Moderately Effective
	No Waterbody Crossing <u>OR</u> Effective	Mostly Effective	Effective <u>OR</u> Moderately Effective
Marginally Effective (all in each line are true)	Marginally Effective	No Road Segment <u>OR</u> Effective <u>OR</u> Mostly Effective <u>OR</u> Marginally Effective	Effective <u>OR</u> Moderately Effective
	No Waterbody Crossing <u>OR</u> Effective <u>OR</u> Mostly Effective	Marginally Effective	Effective <u>OR</u> Moderately Effective
Not Effective (any one is true)	Not Effective	Not Effective	Not Effective



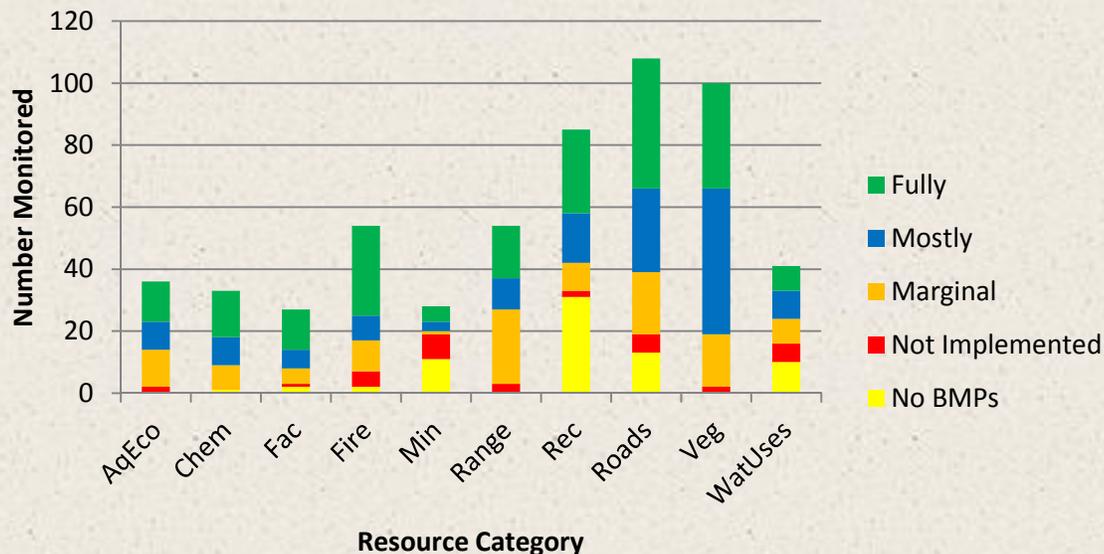
Combined BMP Rating



Combined Rating		Implementation Rating				
		Fully Implemented	Mostly Implemented	Marginally Implemented	Not Implemented	No BMPs
Effectiveness Rating	Effective	Excellent	Excellent	Good	Good	No Plan
	Mostly Effective	Good	Good	Fair	Fair	No Plan
	Marginally Effective	Fair	Fair	Poor	Poor	No Plan
	Not Effective	Poor	Poor	Poor	Poor	No Plan

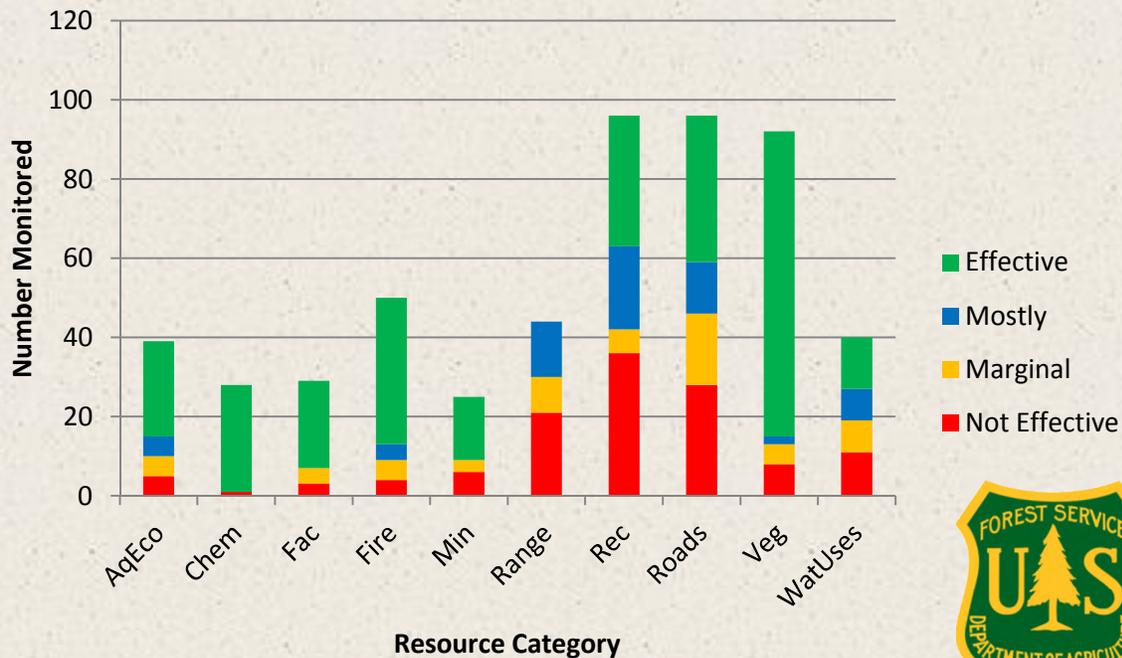


Example Results – FY14 Monitoring



Implementation Ratings

Effectiveness Ratings





Questions?

<http://www.fs.fed.us/biology/watershed/BMP.html>

