

## **Review of Watershed Restoration Action Plan and Watershed Based Plan for Escudilla Landscape**

### **GENERAL COMMENTS:**

The United States Department of Agriculture Forest Service (USFS) Apache-Sitgreaves National Forest, Gila National Forest, Southwest Native Ecosystems Management, and NMED have prepared a watershed restoration action plan (WRAP)/Watershed Based Plan (WBP) for the Escudilla Landscape watershed spanning New Mexico and Arizona. The WRAP was created under the Watershed Condition Framework, a USFS effort to provide a consistent process to classify and restore watershed health in national forests and grasslands. The WRAP is a programmatic document that describes watershed conditions, provides an assessment of relative watershed health, and prescribes possible management measures to restore or maintain the watershed. This document goes further and provides additional detail and planning elements in order to satisfy the Nine Key Elements of Watershed Based Plans for the Environmental Protection Agency's (EPA) Clean Water Act Section 319 Nonpoint Source Pollution Program. The plan is concise, clearly written, contains a wealth of useful data and background information on the watershed, and summarizes the watershed based planning goals and objectives at a subwatershed scale.

Specific review comments and suggestions are included below in red for each of the nine key elements. At this time, the plan cannot be accepted as meeting EPA's Nine Key Elements as it needs some minor additions and revisions: data gaps need to be identified with a plan to address them, critical/priority subwatersheds need to be ranked according to "hotspots" of nps pollutant loadings, technical assistance, milestones, adaptive management/evaluation criteria, monitoring, and outreach need more detail. The plan is in very good shape as is and just needs a bit more detail in the above areas and it will be acceptable. EPA Region 6 is very encouraged to see the USFS take such an active role in implementing watershed based planning into their national forests and grasslands and we look forward to future plans like this one.

Brian Fontenot  
EPA Region 6  
NPS Program Manager for the state of New Mexico

## Element A

*An identification of the causes and sources or groups of similar sources that will need to be controlled to achieve the load reductions estimated in this watershed based plan (and to achieve any other watershed goals identified in the watershed based plan), as discussed in item (b) immediately below. Sources that need to be controlled should be identified at the significant subcategory level with estimates of the extent to which they are present in the watershed (e.g., including a rough estimate of the number of cattle per facility; Y acres of row crops needing improved nutrient management or sediment control; or Z linear miles of eroded stream-bank needing remediation).*

Element A serves as the cornerstone for the logical development of the remaining eight elements. Good sampling data collected through an appropriate water quality monitoring program, field surveys, and land-use characterization, are necessary to identify and quantify the sources of pollution. The data serve as a baseline from which to determine whether water quality goals have been met. Sufficient time and funds should be allocated to develop good information and data before moving forward to developing element B.

### A. Causes/Sources of Pollution Identified

Causes/sources of pollution that need to be controlled to meet watershed goals should be identified.

- a. Are sources of pollution identified, mapped and described? Are causes identified?  
*Yes, sources of NPS pollution are identified and mapped in the watershed or described in significant detail to the category and subcategory level of each NPS pollutant source. The document addresses multiple impairments. The causes of NPS impairments are attributed to channel shape and function, poorly maintained roads, grazing, and absence of riparian vegetation as the primary sources of NPS pollutants.*
- b. Are loads from identified sources quantified?  
*Yes, for impairments with TMDLs or on the 303d list, there are loadings given and roughly broken down by source for some subwatersheds.*
- c. Are there any sub-watershed areas? If so, are the sources broken down to the sub-watershed level?  
*Yes, and the sources are broken down at a subwatershed level.*
- d. Are data sources, estimates and assumptions sufficient, cited and verifiable?  
*These data were collected in accordance with the USFS watershed condition framework. Additionally, the plan has data from TMDLs as well so it is sufficient, cited, and verifiable.*

- e. Are existing data gaps identified? Is there a plan to address data gaps? Are data gaps significant enough to delay implementation?

No, data gaps are not identified in this plan and there is no plan to address data gaps. It is unclear what data gaps may exist and the plan should include a brief description of any data gaps and a rough plan on how to address these data gaps in the future.

### **Element B**

*An estimate of the load reductions expected for the management measures described under paragraph (c) below (recognizing the natural variability and the difficulty in precisely predicting the performance of management measures over time). Estimates should be provided at the same level as in item (a) above (e.g., the total load reduction expected for row crops; eroded streambanks, etc.).*

Numerous models are available to determine which BMPs are more appropriate for reducing pollutant loads and to aid in selecting locations most likely to achieve greatest load reductions. All models have limitations, but the utility of models is optimized when good data are used. Sufficient allocation of time, resources and funding are necessary to achieve this element of the WBP before moving to Element C. The likelihood of achieving water quality improvements and standards attainment relies heavily on Element B.

#### **B. Expected Load Reductions for Solutions Identified**

1. Are expected load reductions analyzed to ensure water quality standards and/or other goals will be achieved?

Yes, load reduction targets are given. The plan provides management recommendations that will help to reduce NPS pollutants to meet water quality standards.

2. Are expected load reductions linked to a pollution cause/source identified in Element A?

Yes. The plan links expected load reduction targets to each pollutant cause/source for the recommended management measures of each subwatershed. Additionally, the plan provides the timeframe and cost associated with remediating each subwatershed.

3. Is the complexity of modeling used appropriate for the watershed characteristics, the scale and complexity of the impairment, and the extent of water quality data identified in Element A?

Yes. SSTEMP, WEPP, and PSIAC are commonly used models for estimating load reductions.

4. Is the basis of the load reduction effectiveness estimate(s) thoroughly explained?

Yes.

5. Are estimates, assumptions, and other data used in the analysis cited and verifiable?

Yes.

## Element C

*A description of the NPS management measures that will be implemented to achieve the load reductions estimated under paragraph (b) above (as well as to achieve other watershed goals identified in this watershed based plan), and an identification (using a map or a description) of the critical areas in which those measures will be needed to implement this plan.*

Over the years, much research has been documented to provide the information needed to identify and target needed BMPs. If targeted at key land uses and parcels of land that are contributing significant pollutant loadings to the streams, these BMPs should achieve the load reductions needed to attain water quality standards. This is contingent on the thorough development of elements A and B. Element C is critical to achieving the load reductions needed in the waterbody to attain water quality standards. Waterbody load reductions will be dependent on the use of sufficient water quality data and appropriate modeling for determining BMP type and location.

### C. Nonpoint Source Management Measures Identified

1. Does the plan list and describe BMPs that will address the causes/sources of pollution identified in Element A?  
**Yes. The plan lists projects to improve water quality that could be achieved by implementing BMPs and specific BMPs are mentioned for each subwatershed and identified on individual maps. The management measures recommended are implementable, instream and out of stream BMPs that will directly address the causes/sources of NPS pollution and help to achieve load reduction goals.**
2. Are the expected BMPs mapped in the watershed? Have critical and priority areas been identified?  
**Yes the BMPs are mapped at a subwatershed scale. However, the plan does not prioritize critical or priority areas that should be addressed first. For example, if the highest NPS pollutant loadings are due to road runoff from poorly maintained roads, then the specific subwatersheds with poorly maintained roads should be prioritized as “NPS hotspots” and addressed first. The plan should include a brief discussion of which subwatersheds should be addressed first to achieve the most load reductions in these NPS hotspots and rank them to identify critical/priority areas.**
3. Is the rationale given for the selection of BMPs? Are selection methods documented?  
**Yes, the selection rationale for the BMPs is given for each subwatershed and broken down into essential and complimentary BMPs.**
4. Are BMPs applicable to the pollutant causes and sources? Are they feasible and can they be linked to load reductions in the impaired waterbody?  
**Yes. The BMPs are applicable to the pollutant sources and they are feasible and clearly linked to the pollutant along with the expected load reductions from their implementation.**

5. In selecting and siting the BMPs at the sub-watershed level, are the estimates, assumptions and other data used in this analysis technically sound?

Yes, the selected BMPs sited at the subwatershed level do appear to be based on technically sound assumptions and data.

#### **Element D**

*An estimate of the amounts of technical and financial assistance needed, associated cost, and/or the sources and authorities that will be relied upon, to implement this plan. Expected sources of funding, States should consider Section 319 programs, State Revolving Funds, USDA's EQIP and CRP, and other relevant Federal, State, local and private funds to assist in implementing this plan.*

Thorough characterization and understanding of the baseline conditions of the watershed – as defined and identified in elements A-C – will provide the necessary basis for determining the appropriate technical and financial needs to support the implementation actions of the watershed plan. Support from various funding sources will leverage 319 funds and increase the likelihood for success. WBPs should describe available funding sources and how they will be secured. Any leveraging of funding and collaboration concerning technical and financial aspects are a plus and should be included.

#### D. Technical and Financial Assistance

##### 1. Estimate of Technical Assistance Needed

- a. Are sources of technical assistance included?

Needs for technical assistance are documented, and partners/sources are listed.

- b. Does the WBP describe the anticipated involvement of assisting agencies, watershed groups or volunteers?

The essential projects section lists partners and their expected financial contributions; however, the assistance sources need to be described better in terms of their expected involvement. This needs to be detailed for assistance sources that are currently committed to working in the watershed as well as what the USFS would like for potential future assistance sources to be involved with.

- c. Are additional technical assistance needs identified?

No additional needs are identified. EPA recommends including needs to address any potential data gaps identified in future revisions of the plan. Technical assistance from other agencies could be recruited to address these NPS loading data gaps.

##### 2. Estimate of Financial Assistance Needed

- a. Is a detailed cost estimate included?

The plan provides a detailed budget.

- b. Does the cost estimate include a reasonable estimate of all planning and implementation costs?

For the most part, yes. However, the budget does not go into detail about monitoring and education/outreach costs. For both monitoring and

education/outreach, a breakdown of planned activities and associated costs (including those conducted by external agencies such as NMED) is recommended.

- c. Are all potential funding sources listed? Is there an estimated contribution from each source?

No. Total contributions from all partners are not broken down by each partner source. Overall, the budget provides a detailed estimate of restoration costs, but the list of potential funding sources is not exhaustive. For example, OSM/VISTA volunteering, EPA's Section 319 and Clean Water SRF programs, and NRCS NWQI funds are all potential targets for funding in this watershed. The State of New Mexico also may have some additional funding sources. It is recommended that this portion of the plan be updated after consultation with NMED staff.

### **Element E**

*An information/education component that will be used to enhance public understanding of the project and encourage their early and continued participation in selecting, designing, and implementing the NPS management measures that will be implemented.*

Elements A-C are critical components to provide the public with the correct and credible information needed to strengthen stakeholder support throughout the watershed. This element has three aspects: 1) generate sufficient information and support to allow voluntary implementation by targeted land-users; 2) understanding and support to maintain BMPs after the project is completed, when loadings are determined to be achieved and water quality attained; and (3) generate a stakeholder system that garners sufficient local input in the development of the WBP from the inception to conclusion of the effort.

#### E. Education/Outreach

1. Does the WBP identify relevant stakeholders?

The plan provides a list of relevant state, federal, and local agencies that are current or potential future partners.

2. Does the WBP educate the public? Are there mechanisms to keep the public informed as the WBP is implemented?

Yes, the plan does provide opportunities to educate the public via events, meetings, workshops, brochures, and articles

3. Does the WBP include methods to engage stakeholders and landowners in continued participation and implementation?

Yes. There won't be as much of a need for this as BMP implementation and restoration would take place primarily on USFS national forest property. However, education and outreach for private landowners in the watershed and visitors to the national forest (which could be considered stakeholders) is important and so it is good that educational materials will be on hand for national

forest visitors to understand the importance of controlling NPS pollution and maintaining water quality standards and watershed health.

4. Was there active and diverse public participation in the development of the plan?  
No public participation in developing the plan is mentioned, but again it is unclear if this is applicable to a plan developed on national forest property by USFS staff.
5. Do the education components emphasize the need to achieve water quality standards?  
No. The plan should include language indicating that the education components of the plan will emphasize the need to achieve water quality standards. Any revision to this WRAP that includes an education component should include an emphasis on achieving water quality standards.
6. Does the education process prepare stakeholders for continued proper operation and maintenance of BMPs after project(s) is completed?  
No, this is not specifically stated, and EPA recommends that any outreach program activities should include information about how landowners/stakeholders/national forest visitors and patrons can be engaged in or educated about BMP maintenance (if BMPs are located on their property).

#### **Element F**

*A schedule for implementing the NPS management measures identified in this plan that is reasonably expeditious.*

Knowledge of where BMPs need to be applied and whether funds are available, either through local funds, grants or loans, is critical to systematic and expeditious implementation in targeted areas. A detailed schedule should be developed and documentation should be provided on how the watershed group will adhere to its schedule. Credibility of the process depends on the thorough schedule for tasks and milestones. An estimate of when WQS will be achieved is important for inclusion, even if that date extends beyond the project period.

#### **F. Implementation Schedule**

1. Does the schedule/timeline present projected dates for the development and implementation of the actions needed to meet the goals of the WBP?  
Yes. Each subwatershed has a schedule for implementation actions.
2. Is the schedule appropriate based on the complexity of the impairment and the size of the watershed?  
The schedules are broken down for each subwatershed and do appear appropriate for the complexity and size of the plan.

#### **Element G**

*A description of interim, measurable milestones for determining whether NPS management measures or other control actions are being implemented.*

This measure is closely tied to element F – interim milestones will ensure BMPs are implemented on schedule, and in the most critical areas of the watershed, influencing water quality. Early assessment of control

1. Are the identified milestones measurable and attainable?

Yes, the milestones given are attainable and in most cases measurable but the plan does not provide a trackable measure for most of the milestones. Many of the milestones are simply “begin essential restoration projects in subwatershed”. It isn’t clear how many projects would need to be started in order to be “on track”. These are not true trackable milestones in the sense that it does not measure the progress of individual components of the WBP process (i.e. target number of BMPs implemented in each subwatershed, target number of education/outreach activities carried out, improving measurements of water quality, attainment of water quality standards). For example, a potential milestone could be “implement X number of BMPs in subwatershed X by summer 2020”. Using specific milestones like this allows for an evaluation of whether or not the plan is on track. Education milestones such as “distribute X number of brochures or hold X number of training events by summer 2020” would be another example of effective milestones. Without trackable milestones, it is difficult to effectively implement an adaptive management strategy.

2. Does the WBP identify incremental milestones with anticipated completion dates?

No. The milestones do not include clear interim, incremental milestones with completion dates. For example, if the overall milestone is to implement 30 BMPs over 10 years in the entire watershed, then an associated interim milestone could be something like implementing 3 BMPs in each subwatershed per year with anticipated completion dates for these. This level of detail is needed for all aspects of the implementation of this plan (i.e. assembling stakeholders, education, BMP selection and design, BMP siting, BMP implementation, writing of the plan, monitoring, etc.). The milestones should encompass all of the activities necessary to achieve restoration and in such detail that they can be used to evaluate progress.

3. Does the WBP include progress evaluations and possible “course corrections” as needed?

It is unclear if this plan includes “course corrections” or adaptive management strategies. The progress evaluation process listed in this plan is a reassessment using the watershed condition classification technical guide to determine if the watershed condition scores have improved. Additionally, monitoring will assess individual BMP effectiveness to determine if water quality criteria are being achieved and, if not, an adaptive management strategy can be engaged to implement course corrections to get the plan back on track. A formal evaluation of WBP progress linked to clear interim and final milestones should be performed periodically (every few years along with watershed condition reassessment?) to gauge performance and this could also be included as a trackable milestone.

4. Are the milestones appropriately linked with the proposed schedule in Element F?

Yes, but there needs to be more detail in the milestones and a way to use them for progress tracking.

## **Element H**

*A set of criteria that will be used to determine whether loading reductions are being achieved over time and substantial progress is being made towards attaining water quality standards and, if not, the criteria for determining whether this watershed based plan needs to be revised or, if a NPS TMDL has been established, whether the NPS TMDL needs to be revised.*

Implementation should be linked with project expectations. Several components relating to element H could be included in the WBP, including (a) are timelines being met for implementation; (b) are WQS or surrogate measures being met over time; and (c) is a decision process in place to revise the work plan if progress has not been adequate. Element H is critical to gauging WBP effectiveness. The criteria for determining loadings for elements A and B will be reflected in this element.

### H. Load Reduction Evaluation Criteria

1. Are criteria measurable and quantifiable?  
**Yes, the criteria are measurable and quantifiable.**
2. Do the proposed criteria effectively measure progress towards the load reduction goal?  
**Yes, the criteria track the water quality impairments and directly measure them.**
3. Are the types of data to be collected identified and appropriate models described?  
**Yes.**
4. Are target achievement dates identified?  
**Yes.**
5. Does the WBP include a review process to determine if anticipated reductions are being met?  
**Yes, the plan provides criteria to assess anticipated load reductions.**
6. Does the WBP include criteria to determine the need for revisions or mid-course corrections if adequate progress is not made towards the implementation schedule?  
**Not explicitly. It is possible that the watershed condition reassessment could provide an opportunity to make revisions or mid-course corrections and the plan could provide language to link this together.**
7. Is there a clear commitment to adaptive management in the WBP?  
**No and the plan needs to include language detailing how evaluation criteria would lead to potential "course corrections"/adaptive management changes that would kick in if criteria and/or milestones are not met.**

## **Element I**

*A monitoring component to evaluate the effectiveness of the implementation efforts over time, measured against the criteria established under item (h) immediately above.*

This component is very closely linked to elements A, F, G and H. The evaluation component of BMP implementation is necessary to have credible data and information for judging the effectiveness in achieving the load reductions through modeling and water quality sampling.

The element should discuss baseline (before), project-specific (during) and post-project (after) monitoring. The monitoring design should be as streamlined as possible, yet rigorous enough to conclusively assess water quality conditions. Accepted methods for monitoring include use of trends analysis, upstream/downstream comparisons and paired watershed designs. This final element provides the water quality data that will be used in supporting the criteria identified in Element H above. While these two elements are complimentary, the data collected under this element will be used to assess BMP effectiveness in reducing loads to the waterbody.

## I. Monitoring

### 1. Explanation of how monitoring fits into Plan

- a. Does the WBP include a description of how monitoring will be used to evaluate the effectiveness (in reducing loads to the waterbody) of the implementation efforts?

The plan does provide brief descriptions of what the National Forest staff will do to monitor the plan but it does not go into specific detail about where monitoring will take place and how it will link to demonstrating load reductions from implementation. The plan needs to at least briefly describe the monitoring process and how the frequency and monitoring locations will be chosen. The monitoring should be designed to measure BMP effectiveness instream and be linked to load reduction measurement criteria so that monitoring can demonstrate attainment of water quality standards as a result of BMP implementation. NMED employs an effectiveness monitoring strategy where they monitor reaches upstream and downstream of BMPs before and after BMP installation. This provides an effective gauge to determine whether or not BMPs are effective. EPA recommends this approach be considered for this plan as well.

Additionally, the plan mentions external monitoring by NMED and it should briefly describe what NMED will be measuring, how often, where it will occur, and how it will be linked to demonstrate load reductions from implementation.

- b. Will the monitoring plan effectively measure the evaluation criteria identified in Element H?

The monitoring plan needs more detail. This plan should include the types of data to be collected for each impairment/project, who will collect the data, the frequency of sampling, sampling site locations and number, the season of sampling, etc.

- c. Does the WBP include a routine reporting element in which progress and methodology are presented?

It is unclear. The plan does detail a bi-yearly watershed condition reassessment, but it is unclear if it will include the monitoring progress and methodology and if these reports will be shared outside of the USFS (with NMED or ADEQ for example).

### 2. Monitoring Methods

- a. Are the parameters appropriate?

The parameters mentioned do appear appropriate but require more detail in terms of number of samples, frequency of sampling, location of sampling, identity of sampling entity, etc.

b. Is the number of sites adequate?

The number of sites is not explicitly detailed. An approximate number (this can be subject to change) and location of potential monitoring sites should be provided.

c. Is the frequency of sampling adequate?

In some cases, frequency of sampling is mentioned, but it is unclear if this is frequent enough (once a year in some cases, once every five years in others). The plan should provide both the sampling frequency of all monitoring activities as well as rationale for why some only need to be sampled once a year or every five years versus others that may be better sampled monthly (as in the case of the thermographs).

Additionally, any baseline sampling that has been completed should be included in the plan to evaluate progress. An effort should be made to provide the baseline data before BMP implementation. Sampling frequency during the implementation process should adequately capture seasonal variation in temperature, storm activities, and flow conditions so some of the proposed monitoring such as “watershed condition classification” is likely appropriate for once every 5 years, but other types of monitoring such as temperature downstream of implemented BMPs would likely need monthly sampling to fully understand the full seasonal effect on temperature variation.

d. Is the monitoring tied to a quality assurance plan?

No QAPP is mentioned in the plan. EPA recommends including language about the writing of a monitoring QAPP into the implementation schedule (Note that this will likely be required for any external monitoring done by NMED).

e. Will the monitoring method effectively link the load reduction from implementation to improvements in the waterbody?

Not enough information about the monitoring component is given to assess this. See above in question 1a for an explanation of how NMED uses monitoring to link load reductions from implementation to waterbody improvements.

Appendix  
Watershed Based Plan Review Summary  
for:

<b>State</b>	New Mexico
<b>Watershed</b>	Escudilla Landscape Watershed
<b>Region</b>	6
<b>Date</b>	October 2018
<b>Author(s) and Organization</b>	USFS, NMED, Southwest Native Ecosystems Management
<b>Reviewer(s)</b>	Brian Fontenot

<b>Pollutants Of Concern 303(d) listing</b>	Temperature, Turbidity, DO, Nutrients
<b>Land Uses</b>	Recreation, private lands, roads and trails, rangeland, fisheries, wildlife, T&E habitat
<b>Targeted Sources of Pollution</b>	riparian vegetation loss, altered stream channel morphology, livestock grazing, road runoff, upland diversions leading to reduced flow, and streambank destabilization
<b>Watershed Size/HUC</b>	HUC #15020001 and 15040004.
<b>Model Used</b>	SSTEMP, PSIAC, WEPP