

16. WATERSHED AND AIR

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Watershed Health - General

1. Activities that damage watersheds should be prohibited;

2. The Forest Service should consider the effects of certain activities on soil erosion; and

3. The Forest Service should prohibit ORV use in order to protect cryptogamic soil crust.

Response: Many comments requested prohibitions on a wide variety of activities, including OHV use, which are seen as damaging watersheds. Rationale for limiting the scope of the prohibition alternatives was outlined in the DEIS, generally in Chapter 1 and more specifically in Chapter 2:

Chapter 1 (pp. 1-10 and 1-11, Purpose and Need):

... only those uses and activities that are likely to significantly alter landscapes and cause landscape fragmentation on a national scale be considered for prohibition in this proposal.

Other activities identified by the public, such as motorized vehicle use, grazing, mining, and developed recreation facilities, were determined by the agency to either not pose the same level of national risk for adversely impacting Roadless areas, as do road construction, reconstruction, and timber harvesting, or some of these activities, such as mining, are already governed by law.

Chapter 2 (p. 2-18): The second and third paragraphs provided the rationale for limiting the scope of prohibited activities to those described in the alternatives.

The scope of prohibition actions considered in detail has been limited to road construction, road reconstruction, and timber harvesting because these activities pose disproportionately greater risks of alteration and fragmentation of natural landscapes ...

In addition, data on uses in roadless areas including OHVs, rights-of-ways, and special uses, are not available, nor have the protocols been established for collecting this information. Until the protocols are established and these data are available, it is premature to address these other uses at this time.

4. Improved water and air quality is not the result of excluding existing ways of life or industrial activities.

Response: Many significant gains in water and air quality in the past three decades have been through cooperative implementation of key environmental legislation such as the Clean Water Act, Clean Air Act, Safe Drinking Water Act, and other similar landmark works. While none of these Acts excludes existing ways of life or industrial activities, they do place many specific restrictions on those ways of life and industries to bring them into compliance with the relevant laws. The proposed rule would not exclude any existing ways of life or industrial activities in pursuit of water and air quality, although the proposal will limit, or regulate some specific activities in some specific inventoried roadless areas through prohibitions. The effects of the alternatives on social and economic factors were disclosed in the DEIS on pp. 3-160 through 3-239.

5. Road construction should not be halted because of damage to watersheds. Properly constructed roads do not cause such damage.

Response: This concern was addressed in detail in the section on watershed health (specifically see DEIS pp. 3-22 and 3-23). This section is expanded in the FEIS to better address these concerns. Decades of extensive research around the world have established the negative impacts of road construction, reconstruction, use, and maintenance on watershed health. The Forest Service takes great care to design and manage roads using best management practices (BMPs) that use the latest technology and erosion control methods in accordance with all Federal, State, and local environmental guidelines. However,

even proper design, construction, reconstruction, use, and maintenance cannot completely eliminate their short- and long-term effects on watersheds. This is particularly true for storm and runoff events that exceed road design standards and erosion control measures.

Another complicating factor is the current Forest Service road maintenance budget, which is sufficient to maintain only 20% of the existing road miles. Since future road maintenance budgets are not projected to increase significantly, constructing additional road miles, even to the highest standards, would increase the maintenance workload, resulting in more miles improperly maintained, and ultimately damage to watershed health.

6. The proposed rule should contain language to improve watershed management or reduce environmental degradation.

Response: A primary intent of the proposal (pp. S-4, S-36, and 1-1 through 1-3) is to protect watersheds by limiting road construction and reconstruction in inventoried roadless areas. A number of existing national forest and grassland programs promote improvement of watersheds and related resources, including the Forest Service Soil and Water Improvement program, Fish Habitat Improvement program, Range Betterment program, and road decommissioning accomplishments. The Clean Water Action Plan and the Northwest Forest Plan, for example, all place major emphasis on watershed management.

7. The Forest Service should address the Watershed Improvement Needs Inventory backlog which represents the backlog of rehabilitation and restoration projects needed to repair damage to the watershed and ecosystem.

Response: The Roadless Area Conservation DEIS evaluates a range of alternatives to help the agency determine how best to manage inventoried roadless areas on the national forests and grasslands. The proposal specifically addresses limits on construction and reconstruction of roads in inventoried roadless areas. Aside from the backlog of maintenance for existing roads, the proposal does not address other backlogs for maintenance or construction, such as watershed improvements, recreation facilities, dams, water facilities, or other needs. These needs are being addressed through existing budgeting processes for

national forests and grasslands. Therefore the concern for addressing watershed improvement needs is outside the scope of the Roadless Area Conservation proposal.

8. Logging can be damaging to watersheds, and should be restricted in those areas where it is causing damage.

Response: The DEIS documented in detail (pp. 3-22 through 3-46) the impacts that timber harvesting and related activities, such as road construction and reconstruction, can have on watershed health. The DEIS described a wide range of alternatives that allow or limit timber offer levels. Where timber harvesting occurs, harvest operations would comply with contract clauses, forest plan standards and guidelines (BMPs), and any applicable State and Federal water quality guidelines to maintain watershed health.

9. Although protecting watersheds is crucial, it does not require banning all timber harvest.

Response: Protection of watershed health is a critical element in the proposal to change the management of roadless areas on the national forests and grasslands. Alternative 2 does not prohibit timber harvesting in inventoried roadless areas, but allows harvest methods that do not require road construction. Alternatives 3 and 4 would prohibit different levels of timber offer, with all timber commodity and stewardship offer prohibited in Alternative 4.

10. The Forest Service should address the importance of roadless areas to clean air and water.

Response: The protection of water, soil, and air resources is one of the primary reasons for the Roadless Area Conservation proposal. These values were specifically mentioned in President Clinton's October 13, 1999 address on Reddish Knob on the George Washington-Jefferson National Forests, which set in motion the activities leading to issuance of the DEIS. The Notice of Intent, published on October 19, 1999, further emphasized the importance of these resources in highlighting the need to minimize the impact of roads in inventoried roadless areas. The DEIS, on pp. 3-22 and 3-23 further emphasized the importance of these resources and the entire section on watershed health (pp. 3-22 through 3-46) provides further detail on the effects of road construction, reconstruction, and timber

management on water, soil, and air resources and how these effects change in response to the alternatives considered. The FEIS strengthens information presented in the DEIS with additional detail and references.

11. The Forest Service should complete a site-specific analysis of the consequences of the proposed rule on watershed and air resources.

Response: The proposed rule is designed to provide national direction on the management of inventoried roadless areas. Under the rule, the prohibitions would not allow certain activities. The agency believes it has sufficient information on the effects of these activities on watershed and air resources that it is appropriate to implement the prohibitions without performing site-specific analysis of each area.

12. The Forest Service should separate soil, air, and water categories.

Response: The section entitled “Watershed Health” on pp. 3-22 through 3-46 in the DEIS addressed soil, water, and air resources together because these key physical resources are intimately linked in an ecological context in the management of national forests and grasslands. Seven distinct subsections, however, were also included to provide discussions of various aspects of these resources, such as “water quantity and timing” on pp. 3-23 through 3-26, and “air quality” on pp. 3-43 through 3-46.

13. The Forest Service should use watershed boundaries to delineate roadless areas.

Response: Most of the inventoried roadless areas that are the subject of the EIS were delineated in RARE II, in forest and grassland planning, in other processes in accordance with NFMA and NEPA, or in assessments such as the Southern Appalachian Assessment. Criteria the Forest Service used for these delineations considered size of area and absence of roads, not watershed boundaries. Discussion of the merits of using watersheds as the basic land unit or for crossing present inventoried roadless area boundaries is beyond the scope of this document.

14. The Forest Service should revise sections of the proposed rule dealing with water resources to include recent scientific information.

Response: The section on water, soil, and air, DEIS pp. 3-22 through 3-46, included over 60 references, from Forest Service Research, academia, and public and private sectors across the nation, including many key references published during the last five years including this year (2000). The FEIS includes many additional references pertinent to these resources.

Water Quantity and Timing

15. Some managed timber harvest should be done to improve stream flow.

Response: The DEIS section on watershed health, particularly the subsection on water quantity and timing (pp. 3-23 through 3-26), addressed this concern in detail. The last two paragraphs on p. 3-24 focus directly on this question. In summary, detectable annual water yield increases are only evident when unacceptably large portions of the timber in a watershed are harvested. The repeated removal of this amount of forest cover, and the related road construction, use, and maintenance to manage these areas, has negative impacts on water quality and a broad range of other physical and biological characteristics and values.

16. The Forest Service must consider the effects of reductions in water yield on communities and agricultural uses; and

17. The Forest Service should clarify how a cumulative reduction in water yield is beneficial.

Response: The DEIS on pp. 3-23 through 3-26 discussed potential effects of roading and timber harvest on water yields. Most research studies on the subject indicate that roading can change timing and magnitude of peak flow events, but has little effect on total annual water yields. Timber harvest, through a reduction in evapotranspiration, can increase annual water amounts. These effects are most noticeable in smaller watersheds, but become less detectable as drainage size increases. Sedell and others (2000) suggest that relying on augmentation of water supplies from national forest and grassland vegetation manipulation is not a viable strategy for dealing with water shortages. Greater gains can be made by reducing water consumption, improving conservation, and by allocating scarce supplies more efficiently.

Alternative 1 is the only alternative likely to produce detectable change in runoff over background levels from national forests and grasslands, with Region 10 most likely to experience such changes. In the interior west, such as in Wyoming, measurable increases in water yield following roading and timber harvest are not likely because remaining vegetation and evaporation quickly use any additional available water. Alternatives 2 through 4 offer increasing levels of protection for inventoried roadless areas, allowing them to continue to produce high quality water for instream and downstream uses by limiting roading and timber harvest. These alternatives do not reduce the amount of water from the national forests and grasslands, but they do maintain a near normal timing of water delivery.

18. *The Forest Service should consider the importance of forests for water retention; and*

19. *The Forest Service should address the value of trees for spring water retention.*

Response: The DEIS on pp. 3-23 through 3-26 directly addressed the cause-effects relationship between forests and water quantity and flow timing. Healthy watersheds are key to clean and continuous water supplies through rapid infiltration of precipitation, flow with naturally steady response to rainfall and snowmelt, and minimum problems with the quality of both surface and ground water. See also Response 16.

20. *The Forest Service should manage for aspen cover in order to improve watershed yield.*

Response: The DEIS discusses the effects of a variety of alternatives on water quantity and timing on pp. 23 through 26. The Roadless Area Conservation Proposal discusses silvicultural management as a general practice and policy within inventoried roadless areas. However, the silvicultural practices involving specific tree species, such as aspen, whether inside inventoried roadless areas or in already roaded areas, are beyond the scope of this FEIS.

21. *The Forest Service should evaluate the potential for the designation of a roadless area to cause modification of the hydrologic system.*

Response: Pages 3-23 through 3-41 in the DEIS discuss the effects of a range of alternatives on the

hydrology of inventoried roadless areas. The proposal offers a variety of options to protect the clean water and hydrologic response in these areas by limiting road construction and reconstruction as well as some degree of timber harvest. Because these areas are already largely unaltered from their natural conditions, limiting additional disturbance will essentially leave the hydrology of these areas unchanged.

22. *The proposed rule's alternatives should provide an objective discussion of precipitation and runoff events.*

Response: The DEIS on pp. 3-23 through 3-32 discussed precipitation and runoff in several contexts. Generally, roading can change inherent drainage and runoff patterns within a watershed. Occasionally, the volume of water generated by a storm produces a quantity of runoff that exceeds the designed capability of the road system, thus causing its failure, resulting in water quality impacts. In roaded watersheds, the risk of road failure increases with the size of a storm; larger storms are typically more damaging to roads due to the amount of runoff produced compared to runoff from smaller storm events. Storm events would likely have less impact on water quality and quantity in Alternatives 2 through 4 because these entail less road construction, reconstruction, and timber harvest.

Water Quality and Drinking Water Source Areas

23. *The Forest Service should halt logging and road building until watershed area units can be identified.*

Response: All of the major watersheds with inventoried roadless areas that serve as drinking water source areas were identified in the DEIS (pp. 3-26 through 3-28). Specific watersheds that do not meet Clean Water Act Standards were also identified (DEIS, Figure 3-13 on p. 3-30). At the Forest level, watershed analysis is being completed using site-specific and existing data to assess watershed condition. Information generated from this ongoing work is used for land management plan revision decisions and project level work.

24. *The Forest Service should consider the importance of roadless areas in protecting*

municipal watersheds and maintaining watershed stability.

Response: A recent publication on water resources and the Forest Service (Sedell and others, 2000) shows that approximately 14% of the nation's waters come from National Forest System (NFS) lands. The FEIS recognizes the importance of watershed health and the high quality water yielded from those lands. The effects of road building and timber harvesting on water quality and drinking water source areas as well as each alternative's environmental consequences on this important resource were discussed in detail in the DEIS (pp. 3-26 through 3-32). An analysis of landslide susceptibility in inventoried roadless areas was discussed in the DEIS on pp. 3-36 through 3-40.

25. The Forest Service should consider the effects of tree removal on water temperatures.

Response: Road construction, reconstruction, and timber harvest effects on stream temperature were discussed in detail in the DEIS, pp. 3-26 through 3-32.

26. The proposed rule needs to be improved to allow for protection of roadless land surrounding Wilderness areas from timber sales to protect old-growth forests and watershed areas.

Response: Protection of watershed health is a critical element in the proposal to change our management of inventoried roadless areas on the national forests and grasslands. Alternatives 2 and 3 (DEIS) would considerably reduce the timber offered in inventoried roadless areas, and Alternative 4 would prohibit all commodity and stewardship timber offered within these areas. The reductions in timber offer levels and associated road construction and reconstruction would have considerable beneficial effects on water quality by reducing risks of soil loss, landslides, and changes in channel morphology. Where timber harvest does occur, harvest operations must comply with strict contract clauses, forest plan standards and guidelines, and any applicable Federal, State, and local water quality guidelines to maintain water quality and overall watershed health. Watershed analysis is underway on many national forests and grasslands to assess watershed condition at the forest plan and project level to insure our watersheds are managed to maintain or enhance watershed health and long-term productivity.

27. The Forest Service should not destroy forests by opening up pristine acres to exploitation; this will further threaten the quality of remaining water sources.

Response: Protection of watershed health is a critical element in the proposal for changing management of inventoried roadless areas on the national forests and grasslands. National Forest watersheds serve as critical drinking water source areas, provide irrigation water for downstream users, provide recreation opportunities, and serve as habitat for numerous aquatic species. The Roadless Area Conservation DEIS recognized the importance of watershed health and the high quality water yielded from National Forest System lands. The effects of road construction, reconstruction, and timber harvesting on water quality and drinking water source areas were discussed in detail (DEIS pp. 3-26 through 3-32). Also see Response 8.

28. The Forest Service should address the effects of road-induced sedimentation on water quality.

Response: The DEIS addressed the effects of road construction, reconstruction, maintenance, and use in considerable detail in the sections on water quality and drinking water source areas (pp. 3-26 through 3-32) and soil loss and sedimentation (pp. 32 through 3-35). It particularly addressed drinking water source areas as they relate to inventoried roadless areas, Total Maximum Daily Loads (TMDLs), and key areas where soil loss and sedimentation are a concern in relation to roading and timber management.

29. The Forest Service should state where impaired watersheds are located and what their relationship is to roadless areas.

Response: Listing of impaired streams under section 303(d) of the Clean Water Act is the responsibility of the State water quality management agencies. The discussion on DEIS p. 3-28 and the map on p. 3-30 show that throughout the country water quality problems exist in watersheds containing National Forest System lands as well as on many other ownerships. Some of these watersheds contain inventoried roadless areas that are the focus of this DEIS. Local officials or interested publics wanting a current list of impaired watersheds can obtain it from their State water quality management agency or through an EPA regional office. It is beyond the scope of this document to provide such a list or to

discuss impaired stream segments either individually or in detail. Water quality plans that address specific impaired waters and methods for restoring their water quality are a requirement of the Clean Water Act and are prepared on a local scale. These plans are watershed based, cross ownership boundaries, and are prepared cooperatively with all owners and land managers in the watershed. The Forest Service participates in developing these plans where impaired watersheds contain National Forest System lands.

The DEIS presented a wide array of alternatives that allow various levels of land disturbances from road construction, reconstruction, and timber management activities. Alternatives that have reduced levels of disturbance are less likely to have negative impacts on an impaired stream segment on the State 303(d) list.

30. *The Forest Service should address the effect of the proposed rule on the ability of local authorities to address problems associated with the Total Daily Maximum Load.*

Response: Section 303(d) of the Clean Water Act addresses water bodies that fail to meet State water quality standards. One way to improve water quality in these water bodies is the establishment of a Total Maximum Daily Load (TMDL) for the various pollutants impacting the waters of concern. The US Environmental Protection Agency (EPA) delegated the authority to establish TMDLs to the States and Tribes and their respective water quality management agencies. The DEIS presented a range of alternatives that have the potential to affect water quality to varying degrees. Pages 3-26 through 3-32 discuss these affects in relation to water quality limited segments and the establishment of TMDLs. None of the alternatives presented in the DEIS interferes in any way with the ability of States or Tribes to establish or manage TMDLs. The Forest Service at all levels works closely with the EPA, States, and Tribes to coordinate our efforts with theirs in reducing water pollution in an effective and meaningful way.

31. *The Forest Service should define the term “impairment” as it is used to describe watersheds.*

Response: Impaired waters as shown in Clean Water Act Section 303(d) lists are water bodies for which existing technology-based pollution controls are

deemed inadequate for attainment of State water quality standards and designated beneficial uses. The map on p. 3-30 of the DEIS represented both threatened and impaired waters. Waters include streams, rivers, coastlines, estuaries, and lakes within an 8-digit (4th level) Hydrologic Unit Code (HUC). The map showed the percentage of impaired miles of the total stream miles in the watershed. Therefore, if a watershed had 1000 miles of stream, and 100 miles were impaired, the map would show the watershed in the 1-10 % impairment category.

32. *The Forest Service should clarify the discrepancy between the Interior Columbia Basin Ecosystem Management Project’s estimate of impaired streams and that contained in the Draft EIS.*

Response: Figure 3-13 on p. 3-30 of the DEIS was a very condensed version of a more detailed map used in the analysis to describe the affected environment and environmental consequences of the alternatives. The map displayed was designed to depict areas of water quality concern at a national scale, followed with a description of how the alternatives would fare in their likelihood of improving or causing further impairment in these watersheds. In the document, *An Assessment of Ecosystem Components in the Interior Columbia Basin and Portions of the Klamath and Great Basins Vol. III* (USDA 1997), Map 4.2 on p. 1090 has a more detailed display of impaired stream segments. An accompanying Table 4.5 on p. 1091 lists impaired stream kilometers by agency by State.

Two factors would explain the differences between these two displays: scale and accuracy. First, the scale in the DEIS is less able to depict differences afforded by the more detailed ICBEMP display.

Second, the accuracy of the data on the two maps differs. The information displayed in the ICBEMP is of largely 1994 and 1995 vintage. The entire State of Washington is displayed using the less accurate 305(b) data rather than the more accurate 303(d) data. The data used to develop the map in the DEIS are derived from the most recent (1999) information compiled by the EPA and is therefore more current. The ICBEMP report acknowledges this on p. 1088: “Because these estimates are based on existing and accessible data from locally specific State and Federal monitoring programs, they likely underestimate the real extent and distribution of impairment.” In its discussion of temperature data on

the same page, the ICBEMP report goes on to say, “because many of the streams with elevated temperatures were not identified by the EPA assessment reports, it appears that water quality concerns within the Basin may be more severe than previously described.”

33. *The Forest Service should honor States’ valid existing water rights. The DEIS and specialists reports do not explicitly address water rights as a valid existing right.*

Response: The Forest Service recognizes and will accommodate all reserved or outstanding rights provided by statute or treaty. Holders of water rights may need to use means other than road construction or reconstruction to access water rights that reside within inventoried roadless areas. These situations would be infrequent because most existing water management structures and facilities are in roaded areas. Those within inventoried roadless areas are usually along existing roads or trails.

34. *The Forest Service should honor States’ rights to regulate air and water quality.*

Response: The Forest Service fully recognizes the role of States and Tribes in their responsibility, as delegated by the EPA, to implement provisions of the Clean Water Act and Clean Air Act. Any decisions made by a responsible official regarding actions that affect the ability of the Forest Service to comply with these acts, or the ability of the States or Tribes to exercise their responsibilities in carrying out these acts, will be done within the context of full public input and in collaboration with State or Tribal officials.

35. *The Forest Service should honor States’ rights to manage watersheds. This is a particular concern in responding to emergency situations such as wildfire.*

Response: The Forest Service fully recognizes the role of States and Tribes in their responsibility, as delegated by the EPA, to implement provisions of the Clean Water Act. However, it is the responsibility of the Forest Service to manage the portions of watersheds under its jurisdiction within the applicable Federal and State laws. Where a wildfire or other event caused sufficient watershed damage to elevate concern for public health and safety from flooding or other impact, the rule

contains an exception that allows necessary road construction or reconstruction to address that safety concern.

36. *The Forest Service should keep access open to springs and irrigation systems; to snow measurement sites, stream gauges, climate stations, and snow survey data sites (SNOTEL); to air quality monitoring sites, and similar improvements related to the management and use of water, soil, and air resources on the national forests and grasslands.*

Response: A number of respondents were concerned their access to springs, irrigation systems, snow measurement sites, air quality monitoring sites, and similar improvements related to the management and use of water, soil, and air resources on the national forests and grasslands would be restricted or curtailed by the Roadless Area Conservation proposal. The proposal does not close roads or trails on the national forests and grasslands. The alternatives present an array of options that restrict construction of new roads and reconstruction of existing roads within inventoried roadless areas. The vast majority of springs, diversion points for irrigation and domestic water supplies, snow depth and other measuring stations, and similar developments are located in currently roaded areas. Those in inventoried roadless areas are commonly along an existing road or trail that will continue to provide access. Where access may be needed to maintain an existing structure or construct a new structure, methods less disruptive than design and construction of a classified road exist to access the site (horseback, low tire-pressure all-terrain vehicles, helicopter, etc.). Where these methods will not meet the needs of the proponent, the responsible official retains several options to allow reasonable access. Two particularly relevant exceptions in the rule are:

- A road is needed to protect public health and safety in cases of imminent threat of flood, fire, or other catastrophic event that, without intervention, would cause loss of life or property.
- A road is needed pursuant to reserved or outstanding rights or as provided by statute or treaty.

37. *The difference between drinking water quality from a managed forest watershed and water from a roadless watershed is not justification for implementing the proposed rule.*

Response: The importance of roadless areas for watershed health is one of the reasons for the Roadless Area Conservation Proposed Rule (DEIS p.2-4). Further, the DEIS recognized that road construction and timber harvesting can have detrimental effects on water quality and watersheds that serve as drinking water source areas. These effects are typically caused by the introduction of sediment and nutrients into streams and changes in water temperature (pp. 3-26 through 3-27). Within inventoried roadless areas, there are 354 source areas that provide drinking water for public consumption. The action alternatives would prevent additional road construction in inventoried roadless areas and therefore reduce future risks of impairment to streams and drinking water source areas.

38. *The Forest Service should end road building and restore roaded areas to their natural state to prevent erosion and bring back continuous areas for vegetation and wildlife.*

Response: No existing roads would be closed under the Roadless Area Conservation Proposed Rule. Nor does the proposal address how roads will be treated or stabilized. The proposed Roads Policy addresses existing roads. The policy will “make the existing forest road system safe, responsive to public needs, environmentally sound, affordable, and efficient to manage” (DEIS p. 1-16). This policy will identify roads that need to be maintained or upgraded and those that need to be decommissioned. Road problems that contribute sediments will be corrected through regular maintenance and, where necessary, realignment, or stabilization to prevent resource damage.

39. *The Forest Service should consider the effects of agricultural/industrial pollution on watersheds.*

Response: Specific water pollution concerns on forested lands vary widely across the nation. The Roadless Area Conservation proposal focuses on conservation of inventoried roadless areas through a range of alternatives that limit road construction and reconstruction and in some cases timber harvest. The DEIS discussed a number of watershed effects of forest roads and harvest on pp. 3-22 through 3-41. The Forest Service, as manager of watersheds that supply approximately 14% of the nation’s water (Sedell and others, 2000), is concerned about water pollution from all sources. The cumulative effects

analysis in the FEIS discusses the effects of other land uses on water quality in the context of entire watersheds. Assessing the effects of agricultural and industrial pollution on watersheds is outside the scope of this rulemaking.

40. *The cumulative effects analysis for water quality should include an assessment of forestry practices and other actions conducted on private inholdings and adjacent lands.*

Response: The cumulative effects analysis in the FEIS specifically discusses the fact that watersheds with national forests and grasslands also contain many other ownerships and land uses that may contribute to reduced water quality. This is especially true in larger watersheds with a smaller percentage of NFS land, and is more likely to occur in the Eastern and Southern Regions which have a higher percentage of land managed by entities other than the Forest Service.

41. *The Forest Service should consider an alternative that prohibits road building and timber harvest only in roadless areas directly associated with drinking water.*

Response: As a result of comments on the DEIS, this proposed alternative was considered, but eliminated, for the reasons described in the section, “Alternatives Considered But Eliminated From Detailed Study” in Chapter 2 of the FEIS.

Channel Morphology

42. *The Forest Service should not prohibit road construction in roadless areas because if the headwaters of a water system were dammed by rotten logs, great canyons would be created when the log jam broke.*

Response: In inventoried roadless areas, Alternatives 1 through 3 continue to allow timber harvest at varying levels, offering the opportunity to remove accumulations of wood for a variety of commercial and stewardship purposes. Only Alternative 4 prohibits harvest completely. Alternative 1 allows continued road construction and reconstruction, while Alternatives 2 through 4 prohibit these activities with a few notable exceptions. The proposed rule contains a critical exception that address the specific concern over inability to remove

large log jams with high potential to initiate downstream channel erosion (p. A-27):

A road is needed to protect public health and safety in cases of imminent threat of flood, fire, or other catastrophic event that, without intervention, would cause loss of life or property.

Research over the past several decades highlights the important role of large woody material in maintaining proper channel morphology and the habitat this material provides for a wide range of aquatic species. In addition, the risk of large log dams breaching with resulting catastrophic downstream damages, particularly in the relatively remote inventoried roadless areas, is extremely unlikely.

43. *The Forest Service should consider the impacts roads and road construction have on watershed drainage patterns.*

Response: The DEIS, pp. 3-22 and 3-23, addressed the issues of sedimentation, changes in flow, and associated impacts to water quality from road construction. Page 3-22 stated that road surfaces and associated drainage structures such as ditches, and water crossings (bridges and fords) are a particular area of concern. Page 3-23 summarized that “timing of water runoff can change as roads and related drainage structures intercept, collect, and divert waters. This accelerates water delivery to the stream, more water becomes storm runoff, increasing the potential for runoff peaks to occur earlier, be of greater magnitude, and recede quicker than in unroaded watersheds (Wemple and others 1996).” Roads may also accelerate surface erosion and initiate mass wasting events such as landslides and mudflows (DEIS p. 3-32). Pages 3-40 through 3-41 discussed the effects of these changes in watershed processes on channel morphology. All Forest Service permanent and temporary roads are designed and constructed using soil, water, and air best management practices (BMPs) that prevent or reduce water pollution. Current road design and management criteria incorporate the latest knowledge and experience, resulting in fewer effects such as surface erosion, landslides, sedimentation, and dust emissions on water, soil, and air.

Soil Loss, Sedimentation, and Site Productivity

44. *The Forest Service should address the fact that if reconstruction of roads is prohibited, erosion will eventually close them; this will hamper fire-fighting efforts in the event of a fire in these areas.*

Response: The no action Alternative 1 allows road construction and reconstruction in inventoried roadless areas. Alternatives 2 through 4 prohibit some level of road construction and reconstruction with several identified exceptions.

The proposed Roadless Rule doesn’t make management decisions about existing roads. Decisions for existing roads will be addressed under the proposed Roads Policy. When roads are not maintained they can pose a risk to the environment and to public health and safety. The proposed Roads Policy is intended to make the existing forest road system safe, responsive to public needs, and environmentally sound (p. 1-16 of the DEIS).

For inventoried roadless areas, the DEIS included several exceptions to prohibitions that would apply to all action alternatives. One exception allows road construction or reconstruction to protect public health and safety in cases such as wildfire. Another allows realignment (reconstruction) if needed to “prevent irreparable resource damage by an existing road that is deemed essential for access, management, or public health and safety, and where such damage cannot be corrected by maintenance” (DEIS p. 2-4, p. A-27). All alternatives would allow maintenance of existing roads. The Forest Service also has the ability to respond to fires in proposed roadless areas without road access by using smokejumpers, aerial fire retardants, helicopter crews, and similar methods.

45. *The Forest Service should address land clearing associated with logging and the resultant effects on erosion and soil productivity.*

Response: The DEIS placed significant emphasis on the importance of inventoried roadless areas for watershed and ecosystem health. Soil erosion, sedimentation, soil productivity, landslides, and their relationship to road construction and timber harvesting were discussed in detail in the DEIS, pp. 3-32 through 3-40. Where timber harvesting does occur, harvest operations would comply with strict

contract clauses, forest plan standards and guidelines, and any applicable State and Federal water quality guidelines to maintain watershed health. They must also meet standards set in land management plans developed under the new Planning Regulations (36 CFR 219). Currently, watershed analysis is being conducted on national forests to assess watershed condition to assure watersheds are managed to maintain watershed health and long-term productivity.

46. The Forest Service should address the effects of logging on soil compaction.

Response: DEIS pp. 3-32 through 3-35 described the environmental effects of a range of management alternatives on soil loss, sedimentation, and soil productivity. The affected environment presentation briefly described the effects of the alternatives on soil compaction, specifically as it relates to timber harvesting. The discussion does not address the particular components of soil compaction such as mycorrhizal fungi, soil bulk density changes, or loss of pore space for infiltration of water. The discussion addresses soil compaction as a complete topic and therefore addresses these more specific concerns as part of the general discussion.

47. The Forest Service should use best management practices (BMP) to mitigate the effects of road building on water and stream quality.

Response: All Forest Service permanent and temporary roads are designed, constructed, and maintained using soil, water, and air Best Management Practices (BMPs) that prevent or reduce water pollution. Current road design and management criteria incorporate the latest knowledge and experience, resulting in fewer effects such as surface erosion, landslides, sedimentation, and dust emissions on water, soil, and air. Management decisions for existing roads will be addressed under the proposed Roads Policy (DEIS p. 1-16). A more thorough discussion of BMPs was added to the FEIS.

48. The Forest Service should explain how best management practices for road construction minimize environmental impacts.

Response: Best Management Practices (BMPs) are practices or usually combinations of practices that are determined by a State or designated planning

agency to be the most effective and practicable means of controlling point and nonpoint pollutants at levels compatible with environmental quality goals. As such, BMPs are not perfect control, but practicable ones are designed to contain runoff and pollutants within normal precipitation and runoff events, typically 10 – 25 year return interval events. Practices not implemented to design standards will allow some level of pollution to escape. Similarly, storm and runoff events that exceed the design standard of the practice can result in some level of pollution.

49. The Forest Service should enforce regulations in open areas to prevent abuse by users and educate the public about land health so these areas can remain open.

Response: Recent years have seen a significant increase in use of National Forest System lands for both motorized and non-motorized recreation, resulting in more conflicts between users and more cases of damage to landscapes from overuse or misuse. Even with an increased presence of law enforcement officials and expanded education with programs such as “Tread Lightly,” problems continue.

The broad issue of enforcement and environmental education is outside the scope of this proposal.

50. The Forest Service should address the impacts of clearcutting on siltation of rivers and streams.

Response: The concern is related to a specific silvicultural system used on many NFS lands, not specific to inventoried roadless areas and is therefore outside the scope of this proposal. A description of timber harvest effects on sediment production was on pp. 3-32 through 3-35 in the DEIS.

51. Best Management Practices for timber harvest, road construction, and mining should be reevaluated for effectiveness.

Response: Best Management Practices (BMPs) are the primary tool used by the Forest Service to comply with the requirements of the Clean Water Act (CWA) in the area of non-point sources of pollution. BMPs are integral to plans for all land disturbing activities, including road construction, timber harvest, and minerals management. BMPs are reviewed for effectiveness by State agencies

responsible for implementation of the CWA on a regular basis. Necessary BMP updates are done as a part of these reviews. Evaluation of the effectiveness of BMPs is outside the scope of this proposal.

52. *The Forest Service should be particularly sensitive to landscapes evolving in roadless areas in and around Mt. St. Helens National Volcanic Monument.*

Response: The Roadless Area Conservation proposal encompasses inventoried roadless areas across all national forests and grasslands, including specially designated areas such as the Mt. St. Helens National Volcanic Monument. The DEIS discussed the value of unique geologic resources on pp. 3-147 through 3-149, and Chapter 3 of the FEIS contains a separate section on special designated areas.

53. *The Forest Service should consider that road construction will introduce soil bacteria.*

Response: The DEIS addressed the introduction of non-native invasive species on p. 3-88 and has an additional discussion of diseases related to forest management on pp. 3-107 through 3-109. The FEIS contains additional discussion on the role of vegetation management and road construction and reconstruction on the spread of disease through these activities and equipment used to perform these activities. Bacteria are one of many concerns the Forest Service faces in managing resources to prevent or slow the spread of diseases.

Landslides

54. *The Forest should address the accuracy of landslide causes on page 3-38 of the DEIS.*

Response: Landslides in completely undisturbed forests are common and natural landform features in many parts of the West, in landscapes particularly prone to landslides such as the Idaho batholith, the decomposed granitics of the California Sierras, and similar formations. Decades of research, however, confirm that roading and timber harvest can exacerbate these natural situations and increase the probability or risk of increased landslide activity. Pages 3-36 through 3-40 of the DEIS presented a summation of this existing research. Many current studies recognize that current road design, construction, and maintenance practices in areas with high landslide risk are much improved over practices

used in past decades (DEIS p. 3-39). The fact remains that road construction, reconstruction, and timber harvest activities increase the likelihood of accelerated landslide activity.

55. *The landslide risk map on page 3-37 of the Draft EIS should be updated with Wyoming landslide data and maps from the Wyoming State Geological Survey.*

Response: The discussion of mass wasting on DEIS pp. 3-36 through 3-40 used recent but general information on landslide processes and risk. Figure 3-15 on DEIS p. 3-37 depicted the most recent information provided by the U.S. Geological Survey on a national scale. This map scale portrays a generalized risk of landslides in the country. More recent and detailed landslide mapping is available in Forest Service and State and local agency offices throughout the country. Unfortunately, that information encompasses a wide variety of scales, reliability and accuracy and would have resulted in a complex mix of information difficult to use and compare. The USGS information offers an appropriate level of consistency and accuracy for this analysis.

56. *The Forest Service should prohibit road construction and logging because it induces landslides and creates turbid water.*

Response: Pages 3-36 through 3-40 of the DEIS presents a summary of available research on the effects of road construction and logging on the likelihood of increased risk of landslide activity in areas prone to such activity. The majority of studies conclude that the construction, reconstruction, and maintenance of roads and timber harvest activities in areas with high landside potential increase the probability of accelerating the occurrence of these events with the risk of detrimental effects of increased sedimentation in water bodies, aquatic habitats, and drinking water supplies.

57. *The Forest Service should evaluate the role of unlogged and unroaded areas as protection for private property from landslides and flood damage.*

Response: Protection of water and soil resources is one of the primary reasons for the Roadless Area Conservation proposal as documented on pp. 3-22 through 3-23 of the DEIS. Benefits from protecting inventoried roadless areas from logging and related

roading are recognized by the Forest Service and were documented in the DEIS. These benefits occur not only at the site-specific level, but also downstream and on adjacent ownerships.

Recognition that watersheds do not end at national forest and grassland boundaries, but include a wide variety of other ownerships, is one of the driving forces behind the Clean Water Action Plan (CWAP), a national effort to provide a more collaborative approach to watershed management. The Forest Service has a major role in development and implementation of many action items in the CWAP.

Fire Effects on Watersheds

58. *The Forest Service should consider the large fuel build-ups and potential fires that will result in negative impacts on water, erosion, and landslides.*

Response: The DEIS discussed in detail the likelihood of fuel buildups and uncharacteristic wildfire in the section on fuels management on pp. 3-98 through 3-107. The section on watershed health further discussed fire effects on watersheds on pp. 3-41 through 3-43. The opening paragraph in the section entitled, "Fire Effects on Watersheds" stated, "The removal of land cover can increase erosion from raindrop impact and overland flow.

Combustion of vegetation and soil litter can mobilize nutrients that can enter stream waters. Loss of living vegetation can reduce transpiration and increase water available as streamflow. This additional flow can, in the most severe fires, increase flood peaks and flood-flow volumes, which would destabilize and erode streambanks and beds. In some areas, fires can cause soils to become hydrophobic, repelling water rather than letting it flow into the soil slowly. This action can cause higher flood flows and increase erosion and mass wasting. These severe situations can endanger lives, property, and resources on-site and downstream." The DEIS analyzed a range of alternatives that deal with these effects, displaying the likelihood of landslide activity between the alternatives.

The Burned Area Emergency Rehabilitation (BAER) program specifically evaluates severe burns, prescribes and installs land and channel treatments, and monitors results. The BAER program pays specific attention to the risks of increase landslides and works to minimize these risks. Treatments are designed with very careful concern for downstream users and their property. To bolster the DEIS

paragraph quoted above, the FEIS contains additional discussion of fire effects on watersheds with more detail on the BAER program, its purpose, and its relationship to landslide activities.

59. *The Forest Service is doing a disservice to Montanans by neglecting to undertake a study to determine the erosion caused by roads versus erosion caused by the inaccessibility to control fuel loads and wildfires.*

Response: The DEIS discussed soil loss and sedimentation on pp. 3-32 through 3-35 and fire effects of watersheds on pp. 3-41 through 3-43, summarizing much of the research on these topics. The FEIS is not designed to recommend or perform research on these or other topics because other programs and processes within the Forest Service are charged with assessing research needs and performing that research in a scientific and collaborative manner. Therefore, undertaking such a study of erosion would be outside the scope of this analysis.

60. *The Forest Service should analyze the predicted erosion caused by roads versus the erosion from wildfire in a non-managed forest without road access.*

Response: Pages 3-32 through 3-43 in the DEIS discuss soil loss, sedimentation, and landslide activity related to roads, fires, and natural conditions. The effect of the proposal on wildfire frequency is discussed in the DEIS on pp. 3-98 through 3-107. As is pointed out in the DEIS, erosion and sedimentation rates from roads generally exceed rates from other land management activities. Wildfires can lead to landslides on unstable hillslopes but these effects are very site-specific and unpredictable in terms of location and extent.

Air Resources

61. *The Forest Service should address air quality issues.*

Response: The DEIS addressed impacts of the alternatives on air quality resources on pp. 3-43 through 3-46. The FEIS expands this discussion with additional detail and references. In summary, the alternatives have different types and degrees of effects on air quality, varying slightly with the amount of dust emissions from newly constructed

roads and the amount of smoke from prescribed burning or wildfire.

62. *The Forest Service should separate the discussion of the effects of roads from the effects of road uses on air quality.*

Response: It may be technically possible to separate the effects of road construction from road use. However, the total impact of the road on air resources is derived from the construction activity (dust, chemicals, emissions from construction equipment, etc.), maintenance of the road over time (dust, equipment vehicle emissions, etc.), and use by a variety of vehicle types and uses (dust, vehicle emissions). Roads are designed, constructed, and maintained for vehicle use. Analyzing these components together provides a more complete picture of the effects of roads on air resources.

63. *The Forest Service should not preclude adoption of Alternative 1 because of changes in air quality.*

Response: The DEIS evaluated a range of alternatives using a variety of measures displayed in the section, “Comparison of Alternatives” on pp. 2-21 through 2-38. Effects of the alternatives on air resources are only one of these many measures and do not preclude the selection of any alternative or combination of alternatives.

64. *The Forest Service should define where Class I air quality areas are in relation to Forest Service lands.*

Response: Table 3-7 on p. 3-44 of the DEIS listed individual forests with inventoried roadless areas in close proximity to Class I areas for each Forest Service region. Figure 3-16 on p. 3-45 displayed a map of Class I areas in relation to National Forest lands. Unfortunately, the scale of the map did not allow enough detail to show clearly which Class I areas are found in each State or near specific National Forests. To clarify this situation, the map scale in the FEIS has been adjusted to display the information on a full page. Also, Figure 3-16 in the DEIS incorrectly displayed both Class I and Class II areas. The FEIS figure has been revised to show only Class I areas.

65. *The Forest Service should address the interaction of the proposed rule with Class I areas under the Clean Air Act.*

Response: DEIS pp. 43 through 46 addressed a range of alternatives to implement the Roadless Area Conservation proposal. The discussion specifically addressed the Clean Air Act as it relates to Class I areas in text, a table of Forests with inventoried roadless areas in proximity to Class I areas (Table 3-7), as well as a map showing these areas (Figure 3-16). The FEIS contains considerable additional material concerning air resources.

66. *An abundance of trees result in fewer allergy and respiratory problems.*

Response: The DEIS on pp. 3-43 and 3-44 recognized the vital role of clean air in a healthy ecosystem. However, an analysis of respiratory and allergic responses to vegetation would be outside the scope of this proposal.

67. *The Forest Service should explain how nitrogen from gasoline impacts the environment.*

Response: The DEIS, p. 3-44, second paragraph, described the role of nitrogen emission on air quality. Nitrogen oxides are one of the primary gaseous emissions from internal combustion engines. Complex chemical reactions in the atmosphere can convert these gases into particulates that affect visibility. Rounding of the inventoried roadless areas would increase vehicle numbers, increase exhaust emissions, and could lead to lower visibility in these areas.

68. *Air quality will be compromised from a lack of access for fuels management and fire control.*

Response: The alternatives discussed in the DEIS provide a range of alternatives related to fuels management and fire suppression. Three specific sections of the DEIS combine to discuss fire management and effects in considerable detail: fire effects on watersheds (pp. 3-41 through 3-43), fuels management (pp. 3-98 through 3-107), and fire suppression (pp. 3-149 through 3-159). Pages 3-43 through 3-46 describe fire and air quality. Only prohibition Alternative 4 would limit the ability to manage fuels through the use of commodity and stewardship timber sales. The discussions in the sections above detail the effects of disallowing these

activities and the concern over the risk of increased large and severe wildfires. Alternatives 1 through 3 all allow timber harvest, albeit with a variety of limits on access and available harvest options.

69. *The Forest Service should explain how air quality can be better in roadless areas as compared to managed areas.*

Response: There are two important aspects to addressing the relationship between air quality and roadless areas: (1) the quality of air within the inventoried roadless area itself, and (2) the role of inventoried roadless areas in protecting air quality in surrounding areas. In the first instance, the lack of road construction, reconstruction, maintenance, and use will limit the generation of dust and other particulate materials as well as exhaust emissions in areas themselves. Secondly, these undesirable materials will not be available for translocation by wind or other means to other adjacent or downwind areas to impact the quality of air in those areas. These relationships were addressed on DEIS pp. 3-43 through 3-46.

70. *The Forest Service should acknowledge that significant air quality problems on National Forest System lands are not due to sources on those lands.*

Response: The FEIS contains an expanded discussion of air resources and recognizes the influence of actions outside national forests and grasslands as the source of many air quality concerns found on these areas. However, activities such as road construction, reconstruction, and use and timber harvests in and near have the potential to cause or increase air quality problems on a localized basis. These effects were discussed on pp. 3-43 through 3-46 of the DEIS. The cumulative effects analysis in the FEIS also acknowledges the input of outside sources on air quality on national forests and grasslands.

71. *The Forest Service should define “non-attainment.”*

Response: A **non-attainment area** is a geographic area in which the level of a criteria air pollutant is higher than the level allowed by Federal standards.

Criteria air pollutants are a group of common air pollutants, such as carbon monoxide, particulate matter, or ozone, regulated by EPA on the basis of

criteria (information on health and/or environmental effects of pollution). Criteria air pollutants are widely distributed across the country.

A single geographic area may have several pollutants and have to meet the criteria for all of them. The area may have acceptable levels of the criteria, but unacceptable levels for others. Thus, an area can be both attainment and non-attainment at the same time. It has been estimated that 60% of Americans live in non-attainment areas, largely in urban and suburban settings.

These definitions are in the FEIS Glossary.

72. *The Forest Service should address carbon dioxide release, carbon sequestration, and global climate change.*

Response: While the DEIS did not specifically address these issues, the FEIS responds to these public concerns and describes carbon dioxide release, carbon sequestration, and global climate change in the Air Resources section. The *Specialist Report on Physical Resources (October 2000)* includes a more inclusive discussion of these topics, and the appendix on references cited in the FEIS includes numerous additional articles on these topics.

None of the alternatives are likely, by themselves, to have any measurable effect on global atmospheric issues. The planned annual timber offer from inventoried roadless areas is roughly 0.3% of the estimated annual timber offer across all ownerships in the United States. When viewed on a global scale, this effect is even smaller. Reductions in harvest from inventoried roadless areas on national forests will likely be offset by increased harvest on other forest ownerships within the United States and by harvests and imports from other nations, such as Canada. The result of these actions is no net change in atmospheric conditions regardless of harvest offer levels in inventoried roadless areas. The level of road construction and reconstruction planned in the alternatives in the FEIS is too small to have effects on global climate change and carbon sequestration at the global scale.

73. *Performing prescribed burns in roadless areas defeats the purpose of improving air quality in roadless areas.*

Response: Pages 3-43 through 3-46 in the DEIS described many of the concerns related to air quality and prescribed fire and wildfire in and near inventoried roadless areas. The discussion largely revolves around the trade-offs between managed fire and its related emissions versus the unmanaged effects and emissions of wildfires. The key component of this discussion is the relative degree of control afforded in prescribed fire (wind speed and direction, humidity, fuel moisture, time and manner of ignition, selected boundaries for control, etc.) as opposed to having little or no control of these factors in wildfire scenarios. While several periodic low-intensity prescribed fires may cumulatively produce a similar volume of smoke as a single larger wildfire, forest managers have no control about where, how far, or how long the smoke is resident in the atmosphere in wildfire events.

74. The Forest Service should consider the effects trees have on cleaning and cooling the air.

Response: This concern is of a general nature and applies to all forest lands regardless of roadless status or ownership. The analysis required to properly address the concern would be outside the scope of this proposal.

75. The Forest Service should truthfully address the amount of air pollution caused by snowmobiles.

Response: The Roadless Area Conservation proposal focuses on road construction, reconstruction, and timber harvest in inventoried roadless areas of the national forests and grasslands. The DEIS disclosed the effects of those activities on air quality. Snowmobile use and the environmental effects it causes are not within the scope of the analysis of the proposal.

Legislation

76. The Forest Service should support enactment of National Energy Security Act.

Response: The National Energy Security Act is a proposal before Congress, not a law signed by the President. This FEIS would not be the proper vehicle to show support or lack of support for any pending legislation.

End of Watershed & Air Section