

ISSUES AND KEY QUESTIONS

The development of priority issues is critical to focus the scope of a watershed assessment. This chapter lists current priority issues and key questions identified within the Upper Greenbrier Watershed. The issues and questions are organized by the core topics listed in Chapter 1 to assist the reader/user in tracking the items throughout the document.

Soils and Erosion Processes

Issue: Areas of severe erosion hazard, soil sensitivity, and high potential for soil nutrient loss within the watershed need to be identified as potential concerns related to past, current, and future management activities.

- How much area within the watershed has severe erosion hazard and where does it occur?
- How much area within the watershed has sensitive soils and where does it occur?
- How much area within the watershed has high potential for soil nutrient loss due to acid deposition, and where does it occur?

Hydrology and Stream Channels

Issue: Road construction and maintenance, timber harvesting, grazing, natural gas development, transportation activities, and other present day and historic land uses have reduced channel complexity and stability through the addition of sediment, reduction of large woody debris in streams, and runoff modifications. Changes in storm flows and higher storm peak flows are likely occurring within the watershed as a result of cumulative land use impacts. Some of these effects are a result of early 1900s logging, and streams are in a long period of slow recovery.

- What are the basic morphological characteristics of streams and the general sediment transport and deposition processes in the watershed?
- What are the causes of current, unstable hydrologic processes within the watershed?
- What are the sources of accelerated erosion/deposition processes, and what aquatic resource effects are they having?
- How are current riparian conditions contributing to existing channel conditions?
- What are the dominant hydrologic characteristics (total discharge, peak flows, minimum flows) and other notable hydrologic features and processes in the watershed (cold water seeps, ground-water recharge areas)?

- What is needed in terms of aquatic and riparian resource restoration within the watershed?

Water Quality

Issue: The Upper Greenbrier River is an important source of cool, clear, high quality water that supports the water resource beneficial uses within the watershed and downstream. The East and West Forks and their tributaries provide important habitat to fish and the aquatic community.

- What water resource beneficial uses occur in the watershed?
- Which water quality parameters are critical to a healthy aquatic ecosystem?
- What are current water quality conditions, and are there problem areas?
- How is water quality being affected by land uses and facilities?
- What activities could occur in the Upper Greenbrier watershed that would help correct existing sediment sources, or create additional ground disturbance and exacerbate existing problems?

Aquatic/Riparian Resources

Issue: Aquatic habitat and populations have changed dramatically from presettlement times. In general, stream sediment, acidity, and temperature have increased, while large woody debris (LWD), shade, and pool habitat have decreased. Although aquatic ecosystems appear to be slowly recovering, current conditions still limit naturally reproducing native populations of fish and other aquatic organisms.

- What is the condition of water quality characteristics (*e.g.* stream temperatures, water chemistry, sedimentation) and what factors are contributing toward pollutants of concern?
- What is the condition of physical in-stream habitat characteristics (*e.g.* aquatic habitat composition, pool quality, structural complexity) and what factors are influencing this condition?
- What is the condition of aquatic communities and what factors (*e.g.* habitat suitability, habitat fragmentation, non-native invasive species) are influencing the distribution or population viability of native and desired non-native aquatic species?

Issue: Timber harvest activities around 1900-1920 affected riparian conditions throughout the Upper Greenbrier Watershed, and today most stream systems lack sufficient levels of LWD to provide quality fish habitat. Present day land uses may contribute to problems. Degraded

riparian conditions contribute to unstable streams, increased sedimentation, and higher water temperatures.

- Native brook trout require cold clear water. Are current riparian habitat conditions affecting stream shading and water temperatures?
- What activities could occur to improve riparian and fish habitat conditions?
- What activities could occur to improve riparian habitat conditions and improve fish habitat conditions?
- What activities might occur that reduce riparian habitat conditions and reduce the potential for recruitment of LWD and fish habitat improvement?

Vegetation

Issue: Management activities such as timber harvesting, road building, and grazing, along with the introduction of exotic insects and diseases and non-native invasive plants, may have changed tree species composition and structure, or altered biological diversity in the watershed.

- What is the array and landscape pattern of forest types and successional stages in the watershed?
- What processes or activities caused these patterns (fire, wind, mass wasting, insects, disease, timber harvesting, grazing)?
- What plant communities or species are in decline or are considered rare on the landscape?
- How do the current conditions compare with reference or desired conditions?
- How might the current conditions affect future land management objectives and strategies, and what can be done to bridge the gap between current and desired vegetation conditions?

Wildlife

Issue: The watershed features a wide variety of wildlife species and habitats, some of which are relatively rare on the landscape. Species populations, distribution, and habitats have likely been influenced by extensive logging, burning, and other vegetation-altering activities that have occurred since European settlement of the area.

- What is the relative abundance and distribution of species of concern that are important in the watershed (Threatened or Endangered Species, Management Indicator Species, species of interest, Birds of Conservation Concern)?

- What is the distribution and character of their habitats?
- What needs and opportunities are there for habitat protection, maintenance, or enhancement?

Human Uses

Issue: Human uses or features such as energy extraction, recreation, timber harvesting, roads, and trails contribute to the economic health of local communities. The Forest must manage these and many other uses to help meet the needs of the public while conserving natural resources.

- What are the major human uses in the area?
- Where do they generally occur in the watershed (map the location of important uses such as recreation developments, gas well sites/pipelines, and infrastructure)?
- What impacts are the uses having, and what opportunities are there to reduce those impacts?
- What needs or opportunities are there related to human uses or facilities in terms of meeting management objectives and moving toward desired conditions in the Forest Plan?

Issue: Management activities may affect pre-historic and historic sites within the watershed for which the Forest has protection and interpretation responsibilities.

- What heritage surveys have been completed to locate pre-historic and historic sites?
- Where are prehistoric and historic sites likely to occur in the watershed?
- In what locations/settings would these types of sites have the greatest likelihood of preserved features?
- What opportunities or needs are there to further evaluate and interpret heritage resources in the watershed?