Appendix I –Riparian / Wetland Areas and Assessment Methods

Riparian Assessment Methods

The quality of riparian productivity and diversity has been evaluated using two methods. One method, *long-term trend*, assesses trends in riparian health over time. The second method, *Proper Functioning Condition* (PFC), assesses condition of riparian function, which is a result of interactions between geology, soil, water, and vegetation (BLM Tech. Ref. 1737-9). In general, both assessment methods address physical as well as biological attributes and their interrelationships. These attributes include the abundance, structure, and diversity of riparian vegetation and the stability of streambanks.

Proper Functioning Condition Criteria
In response to growing concern over the integrity of ecological processes in many riparian and wetland areas, the BLM Director in 1991 approved the "Riparian-Wetland Initiative for the 1990's," establishing national goals and objectives for managing riparian/wetland resources on land administered by the BLM. The initiative's goals were to restore and maintain existing riparian/wetland areas so that 75 percent or more were in proper functioning condition by 1997, and to provide the widest variety of habitat diversity for wildlife, fish, and watershed protection. Subsequently, the BLM established a definition of PFC and a methodology for its assessment. The BLM has adopted PFC assessment as a standard for evaluating riparian areas and will use it to supplement existing stream channel and riparian evaluations and assessments.

PFC can be defined separately for *lotic* and *lentic* waters, as follows:

> *Lotic waters:* running water habitat, such as rivers, streams, and springs (BLM Tech. Ref.1737-9 and -15)

Lotic riparian areas are in *proper functioning condition* when adequate vegetation, landform, or large woody debris is present to:

- dissipate stream energy associated with high waterflows, thereby reducing erosion and improving water quality;
- filter sediment, capture bedload, and aid floodplain development;
- improve floodwater retention and groundwater recharge; develop root masses that stabilize streambanks against cutting action;
- develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration and temperature necessary for fish production, waterfowl breeding, and other uses; and
- support greater biodiversity.

Lentic waters: standing water habitat, such as lakes, ponds, seeps, bogs, and meadows (BLM Tech.l Ref. 1737-11 and -16).

Lentic riparian/wetland areas are functioning properly when adequate vegetation, landform, or debris is present to:

- dissipate energies associated with wind action, wave action, and overland flow from adjacent sites, thereby reducing erosion and improving water quality;
- filter sediment and aid flood plain development;
- improve flood water retention and groundwater recharge;
- develop root masses that stabilize islands and shoreline features against cutting action;
- restrict water percolation;
- develop diverse ponding characteristics to provide the habitat and water depth, duration, and temperature necessary for fish production, water bird breeding, and other uses; and
- support greater biodiversity.

Because the functioning condition of riparian/wetland areas is a result of interaction of geology, soil, water, and vegetation, the process of assessing whether or not a riparian/wetland area is functioning properly requires an interdisciplinary team, including specialists in vegetation, soils, and hydrology. The team also requires biologists because of the fish and wildlife values associated with riparian/wetland areas. Because of unique attributes of individual riparian areas, site-specific and on-site assessments are necessary.

Riparian/wetland areas are classified as *functioning-at-risk* when they are in functioning condition but an existing soil, water, or vegetation attribute makes them susceptible to degradation. These areas are further distinguished based on whether or not they demonstrate an *upward*, *not apparent*, or *downward* trend. PFC trend (apparent trend) should not be confused with long-term trend (see "Long-term Trend Data", below). PFC trend may incorporate long-term trend data if long-term trend was established prior to the PFC assessment. If long-term trend data are not available, then the Interdisciplinary Team must decide whether evidence exists at the site suggesting a trend in riparian condition. Evidence that supports an "apparent" upward trend determination includes presence of multiple age-classes of vegetation with reproduction. An apparent downward trend determination could be made where active channel downcutting or headcutting exist. Where stream reaches do not show strong apparent trend indicators the team will usually make a *trend not apparent* decision.

Riparian/wetland areas are classified as *nonfunctioning* when they clearly are not providing adequate riparian vegetation, physical structure, or large woody debris to dissipate stream energy associated with high flows. The absence of a particular physical attribute, such as a floodplain,

is also an indicator of nonfunctioning condition.

Riparian/wetland areas will function properly long before they achieve an advanced ecological status. The range between PFC and an area's biological potential then becomes the "decision space" for social, economic, and other resource considerations. Until PFC is attained, management priorities and options focus on reaching this threshold. Areas that meet PFC will be managed to assure a continuation of this condition and possibly for advanced ecological status.

Long-term Trend Data and Methods

Resource area specialists also evaluate riparian/wetland areas on the basis of trend information gathered from field studies. Trend is determined by collecting resource information at a given location at least two different times, then evaluating any changes over time. A variety of field study methods can be used to determine trend in riparian/wetlands (Table 8, Riparian Trend Indicators), including low-level infrared and true color imagery, line intercept vegetation transects, photo points, and aquatic invertebrate samples. When conducting trend studies site-specific resource values and watershed characteristics are used to design monitoring that is appropriate for each riparian area.

Trend evaluations factor in a site's *potential natural community,* the stable biotic community that would become established on an ecological site if all successional stages were completed without human disturbance under present environmental conditions. The potential of a site can vary with the location of the riparian area within the watershed. Several information sources are used to assess site potential.

Specific regional site-guides for determining potential natural communities have not been developed for riparian/wetland areas in southeastern Oregon. However, the BLM currently uses data collected at relatively pristine riparian "reference" areas to predict the potential natural community to be expected at a given site. These reference areas include riparian exclosures that have been in place since the 1970's and 1980's in the nearby Trout Creek and Oregon Canyon Mountains. When comparing plant communities from "reference" streams to those at an assessment site, allowances must be made for differences in flow duration, elevation, aspect, gradient, parent material, and adjacent channel conditions. Specialist and interdisciplinary teams have evaluated plant community composition in several reference sites to estimate potential for assessment sites in geographically associated streams. Additional information on riparian site potentials has been obtained from stream monitoring and study sites in allotments and pastures where livestock grazing practices were adjusted to meet objectives developed for riparian/wetland restoration. For example, an upward trend for herbaceous species (grasses, forbs, sedges, and rushes) is present when an increase in herbaceous cover is observed or when plant species composition changes from early-successional toward late-successional species.

Ecological Status of Riparian Vegetation and Proper Function Condition

Ecological status is the present state of vegetation of a range site in relation to the potential natural community for that site. One of the main goals of the BLM is to have riparian/wetland areas in proper functioning condition (PFC), and an overall objective of this goal is to achieve an advanced ecological status, except where resource management objectives, including PFC,

would require an earlier successional stage. This objective would provide the widest variety of vegetation and habitat diversity for wildlife, fish, and watershed protection.

When evaluating riparian/wetland areas, ecological status should not be confused with PFC. Riparian/wetland areas must be viewed with the understanding that the riparian system is inherently dynamic and PFC can and will occur within any or all ecological stages. PFC is evaluated in terms of, and relationships to, all physical and biological functions occurring within the entire watershed, including the uplands and tributary watershed systems.

To comprehend how riparian/wetland areas operate and how management practices are implemented to ensure that an area is functioning properly, the capability and potential of a riparian/wetland area must be understood. Assessment of existing riparian vegetation condition and stream channel functionality is based upon a given riparian/wetland area's capability and potential. Here, *capability* is the highest ecological status a riparian/wetland area can attain given political, social, or economical constraints, whereas *potential* is the highest ecological status a riparian/wetland area can attain given no political, social, or economical constraints, often referred to as the potential natural community (see "Long-term Trend Data and Methods", above). Some riparian/wetland areas may be prevented from achieving their potential because of limiting factors such as human activities that alter the area's capability.

BLM depicts natural riparian/wetland areas as resources whose capability and potential is defined by the interaction of three components: (1) vegetation, (2) landform/soils, and (3) hydrology, while the functioning condition of these natural riparian/wetland areas are characterized by the interaction of these elements.

In the past, considerable effort has been expended to inventory, classify, restore, enhance, and protect riparian/wetland areas, but the effort has lacked consistency. No single classification, survey, inventory, or rating methods or systems have previously been developed to satisfy the complex interactions of healthy riparian/wetland areas. These areas are in dynamic equilibrium with streamflow forces and channel aggradation/degradation processes producing change with vegetative, geomorphic, and structural resistance. Ecological status determination of riparian/wetland vegetation does not necessarily take into account or address needed information that would be contained within aquatic habitat and stream surveys that is pertinent to the functionality of the riparian/wetland area. This is important because riparian/wetland areas will attain PFC long before they achieve an advanced ecological status.

Management of riparian/wetland areas is implemented to attain PFC as a first step to move habitat conditions of entire watersheds and/or their components that are comprised of uplands, streams, riparian/wetland areas, and lakes and ponds toward achieving terrestrial and aquatic objectives and attainment of Desired Range of Future Conditions (DRFC). Management practices such as grazing, mining, recreation, forest harvesting, and other forms of vegetation management would be designed for healthy sustainable and functional rangeland ecosystems as described in the 1997 "Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management in the States of Oregon and Washington" (Appendix B).

To summarize, PFC and ecological site status are two different characteristics of

riparian/wetland systems. A site in any ecological status may be in a proper functioning condition. Riparian/wetland areas should be judged on the functions that it provides compared to functions that should be present in relation to entire watersheds. All riparian/wetland systems should not be expected to have identical physical and biological functions. Riparian/wetland health (functioning condition), an important component of watershed condition, refers to the ecological status of vegetation, the geomorphic and hydrologic development, and the degree of structural integrity exhibited by the riparian/wetland area.

Riparian Management

In the past, many riparian/wetland areas were degraded by uncontrolled uses. Any management activity that disturbs water, soil, or vegetation can potentially degrade riparian areas. Such activities include livestock grazing, road construction, timber harvest, mining, irrigation, and recreation. In addition, activities that are off-site can affect riparian areas by influencing the timing and amount of overland and subsurface flow of water and movement of soils. Some past land use practices have resulted in riparian areas that (1) have inadequate vegetation to protect streambanks from erosion; (2) lack appropriate diverse vegetation that provides habitat for riparian-dependent wildlife species; (3) contain incised channels that do not allow streams to dissipate flood energy and provide water storage; and (4) provide inadequate pools and shade for aquatic species.

Not all potentially disturbing activities are incompatible with riparian area recovery or management, and not all riparian areas are equally susceptible to degradation. For example, livestock management that adjusts the timing and amount of grazing in riparian areas allows for improvement of riparian vegetation and development of streambanks and floodplains. The application of management practices needs to address requirements for vigorous and diverse riparian vegetation. A healthy riparian community can reverse channel degradation and provide habitat for associated wildlife. In some areas where management has been changed, proactive restoration may be required to slow or reverse physical processes causing channel degradation or to initiate natural recovery of a riparian area. Restoration may include activities such as building structures for headcut stabilization or planting cottonwood or willow species when no natural source exists.