

Marsh-Billings-Rockefeller National Historical Park Hydrologic Trip Report
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Subject: Visit to Marsh-Billings-Rockefeller National Historical Park (MABI) on 5 August 2003. This site visit was conducted in response to a contact I made with Christina Marts whereupon I indicated I would be in the area and was inquiring whether the park had any water resource concerns. Christina indicated MABI was conducting a site assessment to support a forest management plan currently being developed for the park. I was asked to join the park tour with the intent of familiarizing myself with the area for future comment on the plan.

Attendees included Christina Marts (MABI Outdoor Planner), Kyle Jones (MABI Ecologist), Margie Coffin Brown and Jeff Killion (OCLP Landscape Architects), Phil Huffman and Carolyn Bennet (consultants), and myself.

Forest Management Plan

Watershed management should be a key component of the design for forest management at MABI. The plan should consider adjacent and internal land use practices, effects of proposed cutting regimes on hydrology and biogeochemistry, erosion mitigation measures to reduce sediment load to surface water, and the potential for examining results of innovative cutting practices. Experimental forest manipulation studies at sites managed by the US Forest Service have resulted in a variety of nationally and internationally important water resource findings including water yield, hillslope hydrology, surface water chemistry, and variable source area concepts (McCutchan, *et al.*, 2000; Troendle and Reuss, 1997; Hewlett and Hibbert, 1961). These studies can provide guidance to the development of the proposed MABI forest plan and insight to water resource management questions that remain unanswered. Observance of good watershed management practices will result in more vigorous forest health.

Sound silvicultural practices have been established and advancements continue to be made in forest management techniques (e.g. Shepperd and Battaglia, 2002). During the MABI tour I noted Scotch Pine (*Pinus silvestris*) and European Larch (*Larix decidua*) stands along with native tree species. I encourage plan coordinators to contact and review literature from United States and European silviculturalists in order to prescribe best management practices for forest vigor.

Hydrologic monitoring throughout MABI will provide an indication of watershed function over time, which may be attributed to forest harvesting and regeneration practices. A monitoring program should be established with clear goals in mind and appropriate methods to provide useful information. Monitoring could include surface and subsurface water quality and quantity measurements. Current and historical sampling should be reviewed to ascertain what is presently known

about watershed dynamics at MABI. This information should be included in the planning process to establish goals and methods for observing potential change associated with forest management practices.

The potential for preparing a water scoping report was discussed briefly with Christina Marts. A synthesis of water resource information currently available and indication of knowledge gaps would benefit the production of a comprehensive forest management plan. While I will assist MABI with the forest plan as time allows, I encourage the park to present a technical assistance request to the NPS Water Resource Division asking for hydrologic assistance. The formal WRD technical assistance request could be structured as a general request for forest plan assistance, which could ultimately support a future scoping report. A full scoping report should also be requested, but I recommend submitting this separately in hopes of ensuring MABI more immediate assistance.

Erosion

Erosion along portions of the MABI trail system is likely associated with trail construction and maintenance. Water bars along some trails were poorly placed or nonexistent. Cross country ski trails had recently been altered in preparation for the upcoming season. The ski trails were deeply incised, did not include water diversion improvements, and were left as bare soil. I recommend using best management practices for trail maintenance and reconstruction. Coarse wood chips from forest management activities could provide protection from erosion when spread on trails. I will include information on water bar construction for pathways with this document, but suggest consulting with a trail design expert for proper erosion control methods.

Portions of the Pogue Carriage Road are being degraded by stormwater. The area has been examined by an engineer for culvert placement. While culvert installation will reduce roadway impacts from stormwater, hillslope erosion and resultant sediment load to surface water should be considered when developing a stormwater mitigation plan. I will forward a best management plan document for roadway construction, which includes information on erosion and sediment control. Erosion associated with outflow from culverts currently along Pogue Road could also be mitigated through incorporation of the techniques described in the BMP document.

Thank you for the opportunity to visit MABI. I enjoyed my visit and look forward to continued interaction with MABI staff in the near future. If there are any questions or comments you have relative to issues described above, or other issues of concern, please do not hesitate to contact me.