

## **Basin Scale Opportunity Assessment Stepwise Approach – Bighorn Basin**

The goal of the Department of Energy (DOE) Water Power Program's (WPP) Basin Scale Opportunity Assessment (BSOA) project is to develop and implement an integrative approach to assess hydropower and environmental opportunities at a basin scale. Specifically, the project emphasizes sustainable, low-impact, or small hydropower, and related renewable energies, while simultaneously identifying opportunities for environmental improvements in a given basin. The first two years of the BSOA project (FY11 and FY12) involved a pilot study in the Deschutes River basin. Based on this experience, a three-phased, sequential assessment approach for a given basin was recommended for future work. The progression from one phase to the next requires a conscious go/no go decision on the part of DOE and the national BSOA Steering Committee.

The phases are:

- Phase 1 – Scoping Assessments – rapid (approx. 6 months), initial identification, screening and classification of hydropower and environmental opportunities.
- Phase 2 – Stakeholder Engagement - stakeholder-driven opportunity identification, prioritization, and scenario building.
- Phase 3 – Technical Analysis – detailed analysis of interactions and tradeoffs between hydropower and environmental opportunities in the context of other water uses.

The Bighorn basin assessment for FY14 will be a Phase 1 assessment. The intent of a Phase 1 scoping assessment for a given basin is to identify hydropower and environmental opportunities, the stakeholder and policy context of these opportunities, and conditions by which the interactions between these opportunities could be further described through additional data collection, analysis, or new modeling activities specific to that basin.

The outcome of a Phase 1 assessment will be a report documenting a scoping-level scientific assessment of hydropower and environmental opportunities for a given basin, as well as expected stakeholder interests and regulatory, statutory, and water management context specific to that basin. In conclusion, a Phase 1 Scoping Assessment can provide useful information to DOE, the national BSOA Steering Committee, and key basin stakeholders on the feasibility of opportunities for hydropower development and environmental improvements in a given basin.

### **Stepwise Approach for the Basin**

**Identify Key Stakeholders.** Develop a list of key stakeholders in the basin based on information provided by our national BOR contact (McCalman) and EPA Surf Your Watershed. Once key stakeholders have been identified, the basin lead (Tagestad) will provide them with a one-page fact sheet and contact them to discuss. (PNNL)

**Compile Information.** This step includes identifying key literature and geospatial information resources for a basin, performing a literature review, summarizing and annotating important reports and literature, identifying relevant water management policies, summarizing stream hydrological data and reservoir operation information. Key stakeholders may be contacted to provide recommendations for important information resources. (PNNL/ORNL)

**Identify Hydropower Opportunities.** We will use ORNL tools (NHAAP, NSD etc.) to identify existing and potential hydropower development opportunities, including powering non-powered dams, pumped storage projects, in-conduit or constructed waterways, in-stream hydrokinetics, and new sites. Additional resources from BOR and local sources may also be utilized to gain more insight into in-canal/conduit opportunities which will have high relative importance in this basin. (ORNL)

**Identify Key Environmental Issues.** Key environmental issues (e.g., fish passage, water quality, habitat improvement, and recreation) will be identified using a combination of available information in literature resources and geospatial data analysis. Particular emphasis will be placed on environmental issues related to alterations in flow. Environmental issues will be evaluated in terms of those that may pose challenges to hydropower development as well as those that may benefit directly or indirectly from development (i.e., environmental opportunities). We will use our conceptual framework to identify environmental issues and opportunities present in the basin. Geospatial overlay techniques will be used to map and highlight areas of particular environmental concern and importance. (PNNL)

**Integrate Environmental and Hydropower Opportunities.** We will integrate environmental issues and hydro opportunities in a geospatial framework and use a data model and approach developed during FY13 to identify potential “win-win” opportunities for hydropower development and environmental improvement. The data model enables a rapid, flexible, and robust process for assessing interactions between hydropower opportunities and environmental issues that are spatially disparate but functionally linked. Two sets of criteria are used for examining these interactions. The first set classifies interactions that may preclude development, whereas the second set of criteria classifies interactions that may result in a positive environmental effect. (PNNL)

**Produce a Draft Assessment.** A draft assessment report will be written and distributed to gather feedback from DOE, national BSOA Steering Committee and key stakeholders in the Bighorn basin. (PNNL with ORNL review)

**Solicit Review of Draft.** Follow-up with stakeholders and steering committee members to collect feedback on the draft assessment. (PNNL)

**Revise Draft Assessment.** Based on the feedback received in the above step we will revise the assessment. This step may include updates to the data, analytical approach, and data analyses. (PNNL)

**Produce Final Assessment Report.** The final assessment report for the Bighorn basin will be delivered to stakeholders, DOE and the BSOA steering committee and will be made available via the basin.pnnl.gov website. (PNNL)

Step	Description	Due Date	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	Organize Effort	FY13										
2	Identify Basin	FY13										
3	Identify Key Stakeholders	15-Jan		■								
4	Compile Information	15-Feb		■	■							
5	Identify Hydro Opportunities	15-Feb			■	■	■					
6	Identify Key Environmental Issues	1-Apr					■	■				
7	Integrate Environmental and Hydro Opportunities	1-May					■	■	■	■		
8	Produce a Draft Assessment	15-Jun							■	■		
9	Solicit Review of Draft	1-Jul								■	■	■
10	Revise Draft Assessment	1-Aug									■	■
11	Produce Final Assessment Report	30-Sep										■

Table 1. Schedule of proposed Bighorn Phase 1 analysis

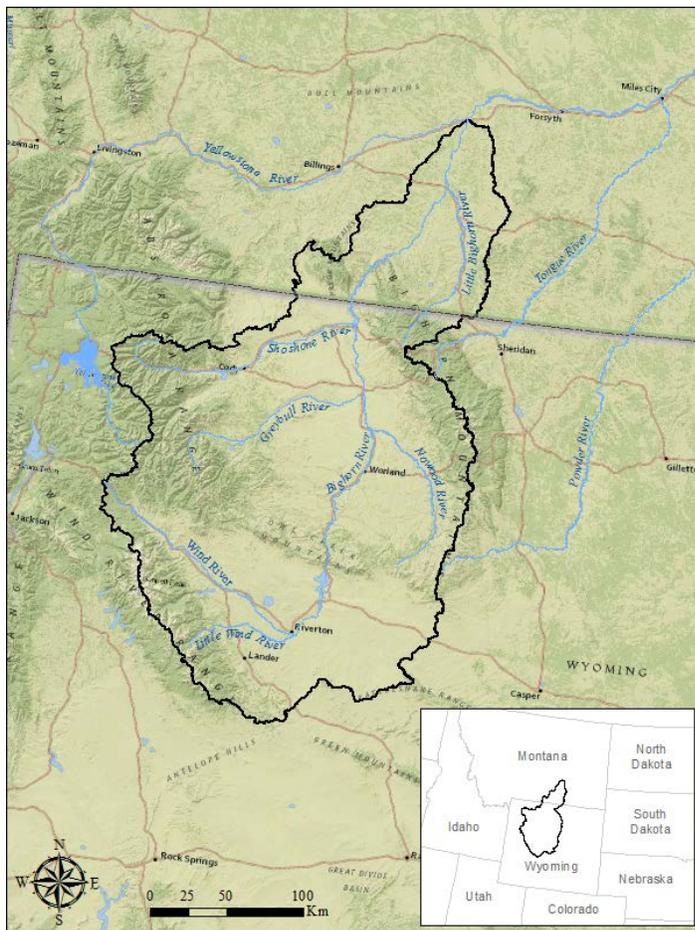


Figure 1. Map of Bighorn Basin showing extent of study area