

Conceptual Design Strategy to Create a Cooperative Interactive Educational Website for the Post-Biscuit Fire Management Study

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May 13, 2008 (Rev. May 21, 2008)

This report has been prepared for Bernard Bormann, USDA Pacific Northwest Research Station (PNWRS), for the purpose of detailing a strategy to complete a cooperative interactive educational website for the proposed post-Biscuit Fire management study. Initial cooperators for the website are PNWRS and Oregon Websites and Watersheds Project, Inc. (ORWW), a 501 c(3) nonprofit corporation based in Philomath, Oregon: <http://www.ORWW.org/About.html>.

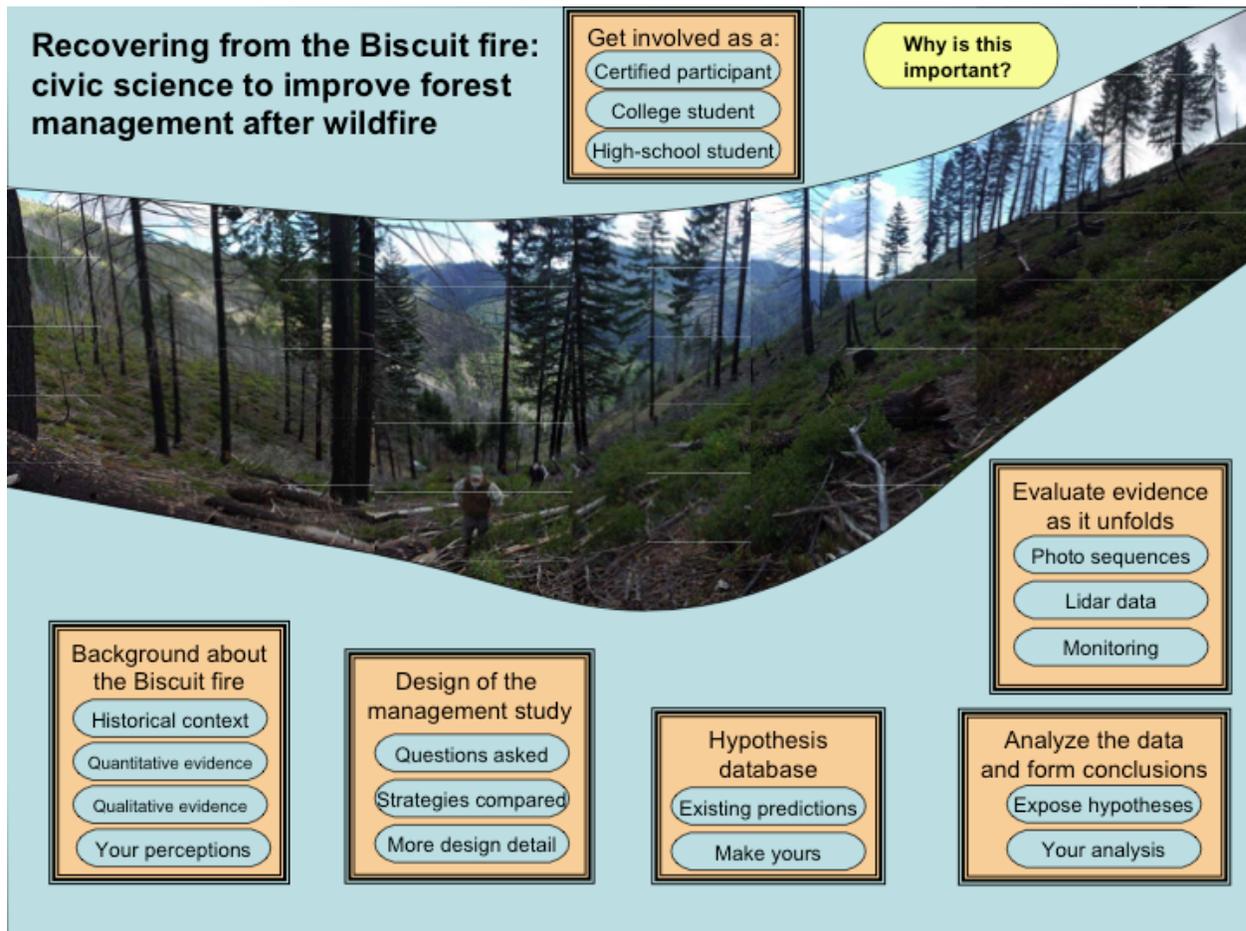


Figure 1. Conceptual homepage design of proposed study website.

The intent of this project is to design and create a stable, independent website that will serve as a principal source of post-Biscuit Fire data for study collaborators and interested public, as an interactive “civil science” and monitoring tool, and as a basis for formal science research and teaching curricula. This report provides a conceptual strategy for achieving those results. It is arranged in six parts: project goals; project background and description; definitions and examples; website design; recommendations for project creation; and a brief summary.

Project Goals.

The goals of this project are to design and create a website that can serve as: 1) a principal source of project data for study collaborators, students, teachers, local schools and residents, and interested public, 2) an interactive civil science and monitoring tool, and 3) a basis for formal and informal science research and teaching curricula.

Cooperative Data Source. The website is designed to be an independent clearinghouse and source for data and reports regarding the Biscuit Fire area generated by agency, university, and industrial scientists, local residents, landowners, and resource managers, area students and teachers, and other members of the interested public. Data can be readily stored for general use in a variety of digital formats, including video-clips (MPG, WMV, MOV), hypertext (HTML, HTTP), text (PDF, DOC, RTF, TXT), pictures, graphs, and illustrations (JPG), spreadsheets (XCEL), GIS, LIDAR, and sound recordings (MP3). As other types of digital data are created, and as other types of software are developed using newer generations of acronyms, existing data can be readily modified and remain available as the new types, functions, and formats come into more general use.

Public Science Education. A second goal of the website is to create an interactive platform as a tool for local and regional science teachers and students to access data or conduct research. The website's function as a comprehensive source of post-Biscuit Fire datasets can be readily searched for projects and reports requiring literature reviews, and the entire library of digital datasets can be searched and downloaded as needed for reports, presentations, or online discussions. The addition of an interactive educational function, such as Blackboard (Blackboard, Inc. 2008), would make it possible for students, teachers, and field researchers to develop hypotheses that could be tested using the websites' existing content, or by developing additional content to be shared by others.

Long-term Research & Monitoring. The third principal goal of the project website is to create long-term research and monitoring opportunities for study cooperators that can be shared with the general public. Initial long-term research hypotheses for the study (Bormann, et al. 2004), for example, can be generally monitored and displayed at a landscape-scale for both scientific and public information purposes with digital repeat photography grids (Zybach and Lapham 2004):

- Can late-successional habitat be restored and protected by managing in more than one way in USFS Reserves burned in the Biscuit Fire?
- How fast will various management pathways, and their interactions with natural disturbances, achieve late-succession conditions?

Project Background & Description.

The 2002 Biscuit Fire was the largest wildfire in the history of southwest Oregon, covering nearly 500,000 acres of forestland, most of which is managed by the USDA Forest Service (USFS). The proposed study and planned website are a direct result of a proposed 36,000-acre replicated “learning experiment” described in Appendix A to the Biscuit Fire Recovery Plan Final Environmental Impact Statement (Bormann, et al. 2004), as adopted by the USFS and USDI Bureau of Land Management (BLM) in 2004 (“Appendix A”).

The intent of coupling an independent educational website with the proposed study is for purposes of project monitoring, public outreach, and as a collaborative source for post-fire management information, education, and research. Several discussions involving PNWRS and ORWW principals have taken place since the adoption of Appendix A, and formal efforts have been made for funding this proposal. A current application for long-term funding of the study and website remains pending with the U.S. Endowment for Forestry and Communities.

This report represents the completion of an agreement between PNWRS and ORWW principals intended to result in the eventual creation of a cooperative educational website to help achieve the goals and objectives of the planned Post-Biscuit Fire Management Study.

Definitions & Examples.

The following terms are used in this report and in Appendix A. Several website links are provided as examples of how the proposed website might look, or that contain information likely to be assimilated or consulted during website construction.

Civil Science. For purposes of this report and discussion, civil science can be described as: 1) involving and improving local applied science education and research, particularly in fields of value to federal management of natural and cultural resources and to public science education, and/or 2) developing scientific data of direct or general management value to local agencies, residents, landowners, and resource managers.

Cooperative. This project is intended to involve and develop a growing association of website users and builders, eventually including USFS, BLM, US Fish and Wildlife Service (USFWS), Oregon Department of Forestry (ODF), Oregon State University (OSU), Portland State University (PSU), University of Oregon (UO), Southern Oregon University (SOU), and other agency, university, and industrial scientists, natural and cultural resource managers, landowners, local residents,

schools, students, teachers, and interested members of the general public. ORWW has been continuously online for more than 11 years, and many of its past sponsors and current users (150,000+ visitors/year) already include members of these target groups:

<http://www.ORWW.org/Sponsors.html>

Cultural landscape. Much of the informational content for the proposed website is intended to reflect local cultural and historical conditions for the study area. The purpose for including these data is to better interpret pre-fire conditions and post-fire objectives at a landscape-scale. Types of such information can be as diverse as historical vegetation patterns and significant topical song lyrics:

http://www.ORWW.org/History/SW_Oregon/References/Walling_1884/Illustrations/

http://www.ORWW.org/Historic_Routes/Oregon_Trail/1852/Popular_Music

Educational value. The educational value of the proposed website can be enhanced by the use of interactive software designed specifically for that purpose:

http://www.blackboard.com/products/Academic_Suite/index

Course lectures and field studies can also be enhanced with the use of hypertext (HTML), video, and text transcripts that can be cut-and-pasted for ease of use and accuracy:

http://www.ORWW.org/B&B_Complex/Policy/NEPA_1969/Issues/Key_People/Bill_Hagenstein/

Other types of software and datasets can be of similar value, depending on user needs and curricula requirements.

Hypotheses. The initial research hypotheses for Appendix A are included in the Project Goals for this study: Can late-successional habitat be restored and protected by managing in more than one way in the USFS Reserves burned in the Biscuit Fire? How fast will various management pathways, and their interactions with natural disturbances, achieve late-succession conditions?

These hypotheses are intended to be buttressed by additional research questions posed by the scientific and academic communities and by interested citizens and citizen groups. An example of how this process may be initiated is illustrated by an exercise undertaken by Harney County High School students under the direction of ORWW representatives at the Eastern Oregon Agricultural Research Center in 2002:

http://www.orww.org/Harney_Cattle/Research_Questions.html

Informational. Existing datasets can be enhanced by creation of indexes, addition of search engines, and conversion to modern software applications, such as hypertext. An example of this process is shown by the conversion of historical field reports in the Biscuit Fire area to an edited indexed hypertext table that can be readily searched with standard search engines, such as Google or Yahoo!:

http://www.ORWW.org/History/SW_Oregon/Rogue_Indian_Wars/Correspondence/

Another example is the conversion of historical panoramic photographs of forested landscape patterns to interactive “QTVR” video files (MOV):

http://www.ORWW.org/Wildfires/Biscuit/Babyfoot_Lake/OTVR/

Interactive. By definition, all Internet websites are fundamentally “interactive” in that the visitor decides where to go, what to see, and how long to stay. For the purposes of this project, the term interactive takes on two additional levels of meaning: 1) those website locations that require users to manipulate the data that is presented in order to get additional results, and 2) those locations in which the user receives feedback from other website users.

The first type of interaction is illustrated by any use of the links provided in this report. Youtube is a popular recent example of this general type of interactivity. By adding the words “how to” to the website’s Google search function, a nearly unlimited number of educational video-clips can be readily accessed by site visitors:

<http://www.youtube.com/ORWWmedia>

The second type of website interaction involves multiple users, often with a site moderator or paid instructor at the helm. For educational purposes, Blackboard (Blackboard, Inc. 2008) provides the most well known suite of interactive software applications. More commonly, website “blogs” cost little or nothing to create, and have achieved widespread use and acceptance in the last few years. Examples of blogs intended to encourage public discussion and/or to distribute informational materials to the general public include:

<http://westinstenv.org/sosf/>

<http://www.oregonbiomass.blogspot.com/>

The use and maintenance of these secondary types of interactive websites requires regular attention and constant updating, and is generally far more expensive to implement as a result.

Landscape-scale. For purposes of this study, landscape-scale is defined as tens of thousands of acres. The Biscuit Fire was 500,000 acres in size, and Appendix A addresses 36,000 of those acres.

Learning Experiment. This study was originally described as a “learning experiment,” partly because of the following characteristics (Bormann, et al. 2004):

- The study applies some techniques normally reserved for research studies, including a study plan, hypotheses, an experimental design, replication, random allocation of treatments, and peer review.
- The alternative pathways are considered "treatments" in a statistical sense, and monitoring is considered as measuring response to treatments.

Long-term. For purposes of this study and report, “long-term” is defined as meaning “at least 30 years.”

Management Study. As defined in Appendix A (Bormann, et al. 2004):

This management study is a 36,000 acre replicated landscape-scale management experiment. It is an attempt to help meet both the resource and adaptive-management goals of the Northwest Forest Plan (1994), and thus it must sometimes balance conflicting resource and learning objectives. Focused on questions facing land managers, the study will be implemented as normal business for the Siskiyou National Forest, with limited support from the Corvallis Forestry Sciences Laboratory and other research organizations. The approach is based on adaptive management concepts, using a parallel-learning model.

Public Outreach. For purposes of this report and study, principal public outreach objectives are met with the creation and use of the proposed study website. Other methods of involving the public in this study include public tours, public lectures, and news releases, as generally described in previous funding proposals.

Website Design. Website design includes the visual and structural organization of software and content that directly contributes to site appearance, use, and navigation. Basic concepts for the website designed for the proposed study are further detailed in “Step 1” of the following Recommendations and are illustrated by Figures 1 and 2.

Recommendations

The following recommendations include three (3) steps and seven (7) tasks intended to result in the creation of a draft website designed to basically meet the stated goals of this project. A fourth step is briefly described that is recommended for enhanced website use during the long-term course of the study. The intent of this strategy is to fulfill discussions between PNWRS and ORWW principals that will result in a draft project website capable of continued use and development as funding is made available. A secondary purpose of the recommendations is to identify potential cooperators and collaborators to further enhance study results, website utility, and long-term funding opportunities.

Step 1. *Complete the conceptual design for a post-Biscuit Fire management study web page, including background information links, study design, and interactive hypotheses database, evaluation, and analysis functions. Deliver a (this) report.*

Task 1. The website should be designed to be readily accessible from the ORWW Homepage (2nd or 3rd tier linkage, at most), focus on public outreach and participatory learning and decision-making, and relate specifically to resource management on the Biscuit Fire. The general topic and research question will be: “How might forest resources be best managed after a big wildfire?”

Figure 1 shows a conceptual approach to the project website homepage. A basic navigational link directs visitors toward a self-descriptive portion of the website as a “certified participant,” “college student,” or “high school student.” The idea is to provide developing data and curricula that are customized for particular visitor groups. “Certified participants” would include Biscuit Fire scientists, researchers, teachers, and resource managers. “Grade school students” and “interested public” would be good additional categories for this link.

Figure 2 provides an expanded illustration and outline of five primary links from the Figure 1 homepage. These links and outline are described in greater detail in the following pages.

Background information links. These links would connect to files and websites providing information on basic Biscuit Fire topics, such as “historical context,” “quantitative evidence,” and “qualitative evidence.” Formats would include video clips, photographs, hypertext documents, and PDF files, as demonstrated in a preliminary contract between PNWRS and ORWW completed in September 2006.

Historical context would include cultural landscape history, Indian burning patterns evidence, historical maps and photographs, and other pre-fire information. Historical context data would also include a detailed history of the fire itself, including fire attack response, BAER project results, lawsuits, and Appendix A adoption. Quantitative evidence would include measures directly related to the fire, such as total acres burned, owl and salmon habitat loss, and other measurable post-fire data. Qualitative evidence would include oral history interviews,

eyewitness accounts, and personal opinions. Interactive public outreach options would allow website visitors to express their own observations and opinions, perhaps anonymously.

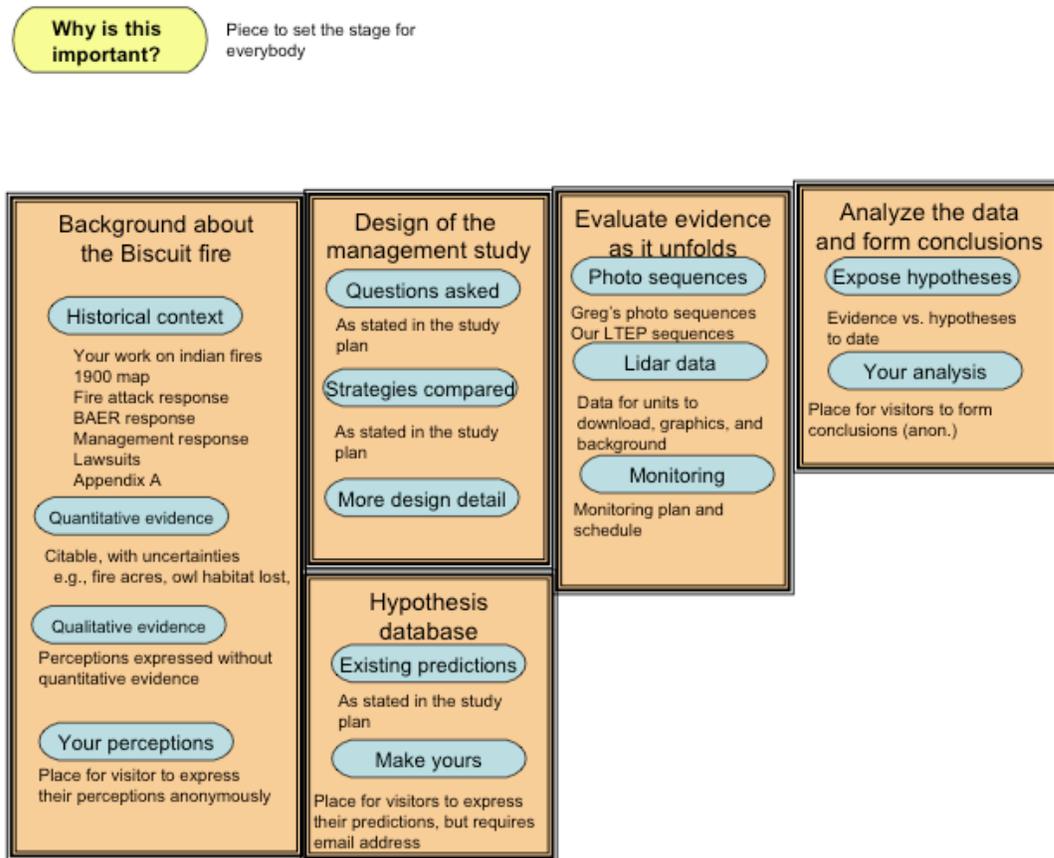


Figure 2. Diagram of primary and secondary links from project homepage.

Study design. This link would detail basic research questions of the study and provide a detailed comparison of established management directions. Options for public commentary on design and methods would be encouraged for consideration of possible future replications of these types of studies. Such commentary may also be helpful for analyzing study results and conclusions.

Interactive hypotheses database. This link would provide existing hypotheses expressed in the study plan, and additional hypotheses as the plan is implemented and matures. Opportunity would be made for visitor groups to add their own hypotheses, both for sharing with the general public and for specific projects, reports, and assignments.

Evaluation. This link would provide principal access to the study's monitoring plan, schedule, and results. Sequential photographs, LIDAR data, and periodic field inventories would be included in this area of the website. This would principally be a data-sharing link and may not have an interactive (user alteration) feature.

Analysis functions. This link would be the primary destination for most website users. It would provide a synthesis of hypothesis testing with collected evidence that would be regularly updated, and would also provide a more formal opportunity for visitors to develop their own analyses. Visitors may or may not be anonymous, depending on user choice and final website design.

Following acceptance of this report and outline, remaining steps and tasks would be completed as described and follows. The end result will be a functional website with the capability to be readily expanded and made available for formal and informal public uses, as described.

Step 2. *Review other website models for public education and participatory learning, including www.charretteinstitute.org, and others on Mt. St. Helens and global warming, and discuss ideas with practitioners at grade school, high school, and college levels. Deliver a report.*

Task 2. The website should integrate and consider reviews of existing interactive public resource planning and management templates, such as promoted by InterCap Holdings and others:

http://www.charretteinstitute.org/resources/NCI_charrette_RFP_template.html

Discussions with George Buckingham, USFS Hebo Ranger District, and others with experience with these types of approaches should be initiated and considered for possible integration into the final website design.

Task 3. Website design should include review and integration of other topical website models for public education and participatory learning, such as might involve Mt. St. Helens, Global Warming, etc.

Task 4. A grade-school level link should be considered. Discussions should include Doni McKay, who is doing a grade school educational project on fungi with PNWRS.

http://www.ORWW.org/PEAS/SZ-Day/SalmonCycle/salmon_cycle.html

Task 5. A high-school level link should be included, following discussions with Robyn Darbyshire and consideration of her successful work (and contacts) with southwest Oregon science teachers and projects.

http://www.ORWW.org/PEAS/Philomath_HS/Benton_County/Swimming_Holes/

Task 6. A college and university-level link should be included, following discussions with John Tappenier, Tom Sensenig, and Tom Atzet regarding work they are doing with OSU, SOU, BLM, and the USFS that focuses on Biscuit Fire topics and locations. Contacts should be made with these individuals to identify possible collaborative efforts, gain insights into existing approaches, and to begin building a network of potential website users and funding sources.

Step 3. *Program and upload to www.ORWW.org a working webpage with the elements in the conceptual design (step 1) and modifications from review and discussions (step 2).*

Task 7. A comprehensive reference library of Biscuit Fire-related PDF files will be assembled and made readily available for initial website visitor use and downloading. Bernard Bormann will take the lead on locating such materials. An example of an existing model for a similar topical website reference source can be found here:

http://www.ORWW.org/Kalapuya-Amin_2006/References/

Step 4. *Following the acquisition of secure, long-term funding, the project website should be made to be as interactive as possible. Project cooperators should be given free rein and encouragement to use, enhance, and build website content and function. Formal educational science curricula can be created, for example, using existing statewide benchmarks and Blackboard (Blackboard, Inc. 2008) software. Public information and discussion blogs can be created and maintained using existing models (e.g., Dubrasich 2008, McKenzie-Bahr 2008). Other options and possibilities should also be considered and attempted, but the principal limitation will continue to be amount and duration of available funding. Appropriate budgetary requirements have been identified in previous funding requests and proposals.*

Summary.

This report outlines the conceptual design for a functional website that is complementary to the objectives of the proposed post-Biscuit Fire study plan (Bormann, et al. 2004). The goals of this project are to design and create a website that can serve as a principal source of project data for study collaborators, students, teachers, local schools and residents, and interested public, as an interactive civil science and monitoring tool, and as a basis for formal and informal science research and teaching curricula.

Formal steps are recommended to successfully achieve these results by putting a final website design online after review and consideration by identified experts and other potential users.

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