

Developing Scientifically Credible Assessment and Analytical Frameworks
For the Ozark National Scenic Riverways and Effigy Mounds National Monument
Natural Resource and Watershed Assessments

PHASE 1 WORKSHOP

Columbia, MO
September 6th and 7th, 2006

Wednesday September 6, 2006

- 8:00 AM Scott Sowa called the meeting to order
- Scott went over some workshop logistics and then Scott gave the participants the opportunity to introduced themselves

8:15 am Presentation: Overview and Purpose of Workshop; Scott Sowa

- Scott gave an overview of the NPS Natural Resource Assessment Program
 - Many national parks are facing increasing threats from human-induced disturbances
 - Congress determined that NPS needs to better understand and evaluate the existing data that are available concerning the state of knowledge and condition of natural resources within each park
 - FY 2003 Appropriations Act, instructed and funded NPS to assess NPS-managed watershed resources
 - Led to Watershed/Natural Resource Assessment Program (NRAP)
 - Purpose: Conduct assessments that will help meet Department of the Interior land health goal reporting as prescribed by the Government Performance and Results Act of 1993 (GPRA).
 - NRAP will allow the NPS to gain this needed understanding and to eventually address threats and issues on watershed or regional landscape scales.
 - Objectives of NRAP
 - Seeks to compile and assess existing information documenting the state of knowledge and known condition of natural resources
 - NRAP outputs form the basis for development of actions to reduce and prevent impairment of park resources through park and partnership efforts
 - Pilot projects launched in most NPS regions
 - Ultimately MoRAP is charged with providing a multi-disciplinary (integrative) synthesis to inform NPS about scientific significance, functional status, and current and emerging issues/challenges
 - Synthesis must incorporate a strong geospatial component (written report and GIS data)
 - Scott then listed some of the potential products
 - As ecosystem assessments we must recognize that ecosystems are complex, hierarchically-structured, multicomponent, interacting biophysical systems

- Landscapes/Major habitats (Context)
- Biota
- Chemical and Physical Properties
- Energy and Nutrient Processes
- Hydrology and Geomorphology
- Natural Disturbances
- No single metric or index can be used to adequately assess ecosystem health
- Ecosystem assessments must be multiscale and multiparameter
- Goal of workshop
 - Develop a framework for the natural resource condition assessments at EFMO and ONSR that will allow the NPS to gain the understanding necessary to address threats and issues on watershed or regional landscape scales
- Workshop Objectives
 - Establish explicit goals and objectives for the assessments at each park
 - Assess and rank the management issues faced by park managers at each park
 - Evaluate other assessments in terms of their geographic, analytical, and ecological frameworks
 - Develop a list of desired end products
 - Identify ecological parameters that will be useful for evaluating resource condition status
 - Determine subset of most pertinent/useful parameters
 - Establish reference, baseline, desired future conditions
 - Identify threat/stressor measures useful for evaluating human disturbances
 - Assess data needs and identify data sources for quantifying resource condition for each ecological parameter and to quantify threats/stressors
 - Assess and identify major data gaps
 - Select geographic framework for assessments
- Scott reiterated that MoRAP has 18 months to do project
 - Group wondered if interim products should be released as they are developed?
 - Scott stated that they won't have a lot of time to put out interim products for review and revision. Thought it would be best to do as they've originally planned, leaving 3-6 months for review of products at end of project.

8:30AM Presentation (Rodney Rovang): Overview of EFMO

- Rodney briefly covered some of the many surveys/studies that have been completed at EFMO for a variety of biophysical parameters
 - Small mammals
 - Forest survey – 1984 and a 20 year follow up
 - Vegetation maps
 - Trail maps
 - Paleo fire study done with coring of wetlands
 - This goes back 6600 years ago, carbon and pollen dating

- Must remember that EFMO is a cultural park
 - Want to know conditions of park during mound building period
- Bird study
- Exotic plant problem in park for garlic mustard, buckhorn honey suckle, Sericea lespedeza
- Want to restore reed prairie grass (?)
- Rodney then discussed the fact that EFMO does have a General Management Plan, which contains significance resource statements with management alternatives for various park resources.
- Rodney provided some examples of geospatial data that are available as well as data and scientific publications.

9:00AM Group Discussion on data needs, limitations, and management issues pertaining to EFMO

- It was stressed that EFMO has both cultural and natural resources and both are important to managing the park. Management plans have stressed this dual management role.
- Historically, EFMO was an oak dominated forest that was fairly open. Today is a sugar maple dominated forest. This is preventing the regeneration of the oak forest. Deer and fire suppression are hindering reestablishment of oak forest.
- Historically, EFMO contained a higher percentage of grassland habitat, yet forest is dominant today.
- Land development and agriculture are two of the biggest threats outside of the park. Another problem pertains to water pollution in the Yellow River, which receives effluent, high in salt content, from a meat plant upstream.
- A Mussel survey conducted on the Yellow River found very few species and there is no evidence that any of the species are reproducing.
- Yellow River has about 3-4 miles in the park.
- Numerous listed species occur within and just outside of the park
- EFMO also contains a few wetlands/small lakes. Biggest lake is 40 acres in size, this lake receives a lot of sediment from adjacent intensive agriculture. The wetland is also filling in. Same lake/wetland that they are taking core samples from.
- Sediment studies around mounds also being done.
 - Most sediment studies show an increase in sedimentation rates. However, some areas are losing sediment.
- Question (Sowa): how regulated is the Yellow River? Is free flowing and a cool water stream, a portion is a losing stream through karst topography. 1/3 of drainage basin has karst influence. There is a meat plant that dumps salt into the stream into a losing reach (untreated sewage). Lots of intermingling of surface and ground water.
- Question: Is state of Iowa monitoring the Yellow River? Yes, going back into the 1950s, but is hit and miss. Includes genetic testing of animal feces so can get genetic markers on say, E. coli. This can be used for “proof” to

show changes resulting from human use. To show what percentage is coming from what species.

- One major concern is the low mussel population. Don't know why; salt?, heavy metal?.
- Wood chips being placed on trails to control erosion. Used to have gravel on trails, but this was prone to erosion. This gravel would change the pH of the soils and in turn would change the vegetation.
- Rodney mentioned that they are looking at possibly putting in no-wake zones for boats on the MS and Yellow Rivers near the park to control erosion.
- Question: (Diamond): Have you done any geology or soil surveys of park? Not, really, but do have some soil studies.
- Recently added 1000 acres to EFMO. This area has very little data.
- Question: (Diamond): Have you done any forest surveys? Some have been done, e.g., masters student Greg Moore (Univ. Wisconsin Madison).
- Rodney stated that they have a lot of information contained in reports and that they have lots of data is "in-house". Rodney gave MoRAP a bibliography that has most of these reports and data. He stated that he can help MoRAP acquire any data or reports they need.
- Rodney also mentioned that there are trout streams in the park.

9:45AM Presentation (Victoria Grant): Overview of Ozark National Scenic Riverways

- Victoria started her presentation with brief Natural History of ONSR and a few general statistics: Established in 1964, ONSR is a narrow linear park with 134 miles of stream and ~80,000 acres.
- She then discussed the purpose of the park:
 - Preserve and protect the unique scenic and natural values, processes, and unspoiled setting derived from the clean, free-flowing Current and Jacks Fork Rivers and springs, caves, and their karst origins
 - Provide for and promote opportunities for the scientific and public understanding of the Riverways natural resources
 - Provide opportunities for the understanding and appreciation of the human experience associated with the Ozark Highlands landscape
 - Provide for uses and enjoyment of the outdoor recreation opportunities consistent with the preservation of the Riverways resources
- Victoria then discussed the significance of the park
 - The ancient Ozark Highlands is an important center of biodiversity in North America
 - over 200 endemic species
 - impressive hydro-geologic character of the Ozark karst landscape supports an amazing variety of natural features in the Riverways, including a spring system that is world-class and unparalleled in North America.
 - Jacks Fork and Current Rivers have been designated by the State of Missouri as two of the three Outstanding National Resource Waters in the state

- Ozark National Scenic Riverways provide opportunities for high quality and diverse outdoor recreation available year round on and along free-flowing rivers
- The Riverways feature archeological sites, historic structures, objects, and landscapes reflecting more than 12,000 years of history
- Victoria then listed some of the values that ONSR tries to preserve, protect, and restore
 - Scenic setting, Natural values, Natural processes, Understanding, Outdoor Recreation, Clean Free-flowing rivers, Caves, Springs, Karst, Biodiversity, Human experience, Cultural features
- She then discussed the various management zones their associated management goals: Zones: Natural, historic, special use, and development (to provide facilities for public).
- Victoria then covered some of the key management issues:
 - River use – Number of watercraft/competing uses
 - Water quality
 - Roads – ORVs including ATVs
 - Horse Use
 - Unrestricted camping
 - Use of vehicles on gravel bars
 - Open fields
 - Opening portion of Big Spring Area to hunting
 - River crossings
 - Use of alcohol on river
- She then provided an overview of the some key data sets that may be useful for the assessment:
 - USGS high resolution Bedrock Geology
 - MDNR 1:12,000 Soils
 - MDC Ecological Classification System
 - Schroeder Historic Vegetation
 - USGS Vegetation/Fuels Map
 - MoRAP Aquatic Classification
 - I&M/Global Change invertebrate data
 - I&M/MDC/NPS fish data
 - I&M birds, amphibians/reptiles,
 - NPS water quality, springs
 - USGS gages
 - CRF caves
 - Vegetation associations
 - Other Information/data sources:
 - US Navel thermal imaging study/data. She said ONSR will finally be getting the raw data for this very soon.
 - Jacobson geomorphology
 - Rabeni fish/habitat relationships
 - Panfil watershed assessment
 - Rabeni conceptual ecosystem model

- Over 1100 documents in NR library...

10:15AM Group Discussion on data needs, limitations, and management issues pertaining to ONSR

- Victoria covered some of the primary management issues facing ONSR
 - Restoration of bottomlands without altering river channel/flows
 - Protecting Scenic easements
 - Hwy 60 will be upgraded in near future, which will promote further development and alter the pattern of development surrounding the park
- Water withdrawals – no direct withdrawals from river. Do have increasing impoundments on upland streams. $\frac{3}{4}$ of streams are losing.
- Low water crossing on upper Current River that is a county hwy acts as a low-head dam and alters flows, sediments, and channel
- Sedimentation and gravel – Gravel “wave” prompted by historic land uses in the watershed is moving through park.
- Road network in park is largely gravel based. 3 times the road miles to river miles. Question: Any BMP’s for these roads? Yes, some. Many roads are in historic locations i.e. in or along channels.
- Wetlands is a key inventory gap. Soils get at this to some degree, but have very little background information on the location, extent, type, connectivity, etc. for wetlands.
- River use is a big issue and is increasing all the time
- Mining of heavy metals outside of the park influence surface and groundwater quality in the park
- Clear-cutting and subdivision development is becoming more of a problem. Huge board-feet removal of wood in lands adjacent to park and broader watershed.
- Most “agriculture” land is pasture. Cattle are a problem for river water quality. 20,000 cattle in upper Jacks Fork watershed. Where there are gaps in the park boundary cattle can get access to river.
- Concentrated horse traffic on trail system. This raises bacterial levels of river water very high; sometimes above “safe” public contact levels.
- Victoria: One important thing for this project – ONSR is on cusp of going from high quality to more of a degraded quality. Better to prevent problems up front rather than try to fix problems after they exist.

10:45AM Presentation (Mike DeBacker): Heartland Network Natural Resource Monitoring Program

- Mike started his presentation by giving a brief history of natural resource management in the NPS
 - 1930’s. Amidst an agency dominated by landscape architects and engineers, George Wright uses his private fortune to conduct the first faunal inventories of NPS units. (Note: the first national parks had been in existence nearly 60 years at this time).

- 1940's. War times conditions stress national resources reducing NPS natural resource staff from it's peak during Wright's and New Deal levels.
- 1956 – 66. Mission 66 initiative concentrates NPS resources and attention on development of visitor services to accommodate record visitation.
- 1970's - present. NPS takes greater responsibility for managing ecosystems, not just charismatic species, driven the by growth of ecological thinking.
- ~1993. Most NPS science staff transferred to the newly created National Biological Survey, which would later become the Biological Resources Division of USGS.
- 2000 State of the Parks Report
 - 80 (1/3) of the “natural resource parks” had no professional natural resource manager.
 - Another 84 parks had only 1 or 2 natural resource professionals.
 - Almost all projects/studies were short-term; staff mostly deals with the “crisis of the day”.
 - Science/data and management are not tightly connected.
 - Parks unable to provide “desired future resource condition” or natural resource goals.
- Mike then discussed the “Natural Resource Challenge” facing NPS, which has relevance for these park assessments
 - The challenge is to revitalize and expand the natural resource program within the park service and improve park management through greater reliance on scientific knowledge. To meet this challenge the NPS is:
 - Accelerating **Inventories**
 - Design/Implement **Vital Signs Monitoring**
 - **Collaboration** with scientists and others
 - Improve **Resource Planning**
 - Enhance **Parks for Science**
 - Assure **Fully Professional Staff**
 - Control **Non-native species**
 - Protect **Native and Endangered Species**
 - Enhance **Environmental Stewardship**
 - Expand **Air Quality** efforts
 - Protect and restore **Water Resources**
 - Establish **Research Learning Centers**
 - Most of these activities are relevant to the Natural Resource Condition Assessments
- Mike then briefly covered the NATIONAL PARKS OMNIBUS MANAGEMENT ACT OF 1998, which also has bearing on NPS monitoring and assessment activities
 - “The Secretary shall undertake a program of inventory and monitoring of National Park System resources to establish baseline information and to provide information on the long-term trends in the condition of National Park System resources. The monitoring program shall be developed in

- cooperation with other Federal monitoring and information collection efforts to ensure a cost-effective approach.”
- “The Secretary shall ... assure the full and proper utilization of the results of scientific studies for park management decisions.
- Mike also provided some language from the FY2000 appropriations legislation that points to the need for inventory, monitoring and assessment of park resources.
 - “This involves a serious commitment from the leadership of the National Park Service to insist that the superintendents carry out a systematic, consistent, professional inventory and monitoring program, along with other scientific activities, that is regularly updated to ensure that the Service makes sound resource decisions based on sound scientific data”.
 - Mike then covered the purpose of the remainder of his presentation
 - Describe planning products and available data that may be useful in the assessment
 - Emphasize importance of incorporating vital signs data into the assessment process
 - Mike then covered the four major components of the planning process associated with vitals signs monitoring program and its relevance to the NRAP
 - 1) Data mining and consolidation
 - Natural Resource Bibliography - comprehensive list of all natural resource related documents for the park
 - NPSpecies database – record of vertebrate and vascular plant species known to occur on the park
 - 2) Conceptual ecosystem models
 - Identify important components and processes of park ecosystems
 - Identify potential stressors and threats to park natural resources
 - Identify potential indicators and measurements
 - K. E. Doisy, Dr. C. Rabeni, and V. Grant. Ozark Plateau River Conceptual Model
 - K.E. Doisy and C.F. Rabeni. Ozark Riparian and Aquatic Systems: a literature review and information synthesis
 - D.A. Weinstein. Forest Ecosystem Conceptual Model
 - Andrew Hansen and Danielle Gryskiewicz. Interactions between Heartland National Parks and Surrounding Land Use Change:
 - Development of Conceptual Models and Indicators for Monitoring
 - 3) Vital signs prioritization and selection
 - List of all vital signs considered for monitoring at each park and their priority ranking
 - Mike provided a handout that provides the priority ranks for each the vital signs at each park
 - Mike also covered some of the vitals signs currently being monitored at each park

- 4) Protocol development and implementation
- Mike then provided some examples of the inventory and monitoring data that are available for EFMO and ONSR
- Mike finished his presentation with a few slides illustrating how he believes that vital signs monitoring data could be incorporated into the natural resource condition assessments.
 - He sees annual status reports, followed by ~5 years trend reports, followed by ~10 year assessments
 - Status and trend reports based largely on vital signs monitoring data, while assessments bring together a broader array of information from within and outside parks
 - Important point is that the status reports, trends reports, and assessments are all integrated into some larger goal of incorporating science into the long term management of parks
 - Mike then discussed the differences, but complimentary nature, between vital signs monitoring, condition assessments and performance goals
 - Vital signs: specific, quantitative, focused
 - Assessments: synthetic, semi-quantitative, GIS-based
 - Performance: general, qualitative, inclusive
 - Difficulty is bridging the gap between the level of detail across these various efforts

11:15 am Questions/Discussion pertaining to Heartland Network and incorporating the monitoring data into the assessments

- Some of the participants wondered if we could develop some kind of an overall index of resource condition for the parks
- Scott Sowa said he wasn't sure on how you could take such disparate/diverse information and merge it into a single meaningful index?
- Gareth Rowell suggested a "Dashboard" approach, using sets of easy to interpret indicators that will assist management decisions.
- The group liked this idea, but stated that developing a standard dashboard would be difficult and since this is a national pilot project we need to stress some sort of standardized reporting.
- The group also agreed that the methods used in this project need to be easily repeatable by NPS staff or others through time. The current idea surrounding NRAP is that these reports would be done every so many years, although this is not a certainty at this point.
- The issue of standards opened a group discussion as to whether these assessments can be tailored to some degree to a specific park or should we strive to include generic measures that will work in most or all parks? The group agreed that some parks have specific issues, and that the key issues/indicators will not be the same across most parks. The group agreed on a compromise, that it is best to have some standard/uniform indicators/measures that would be suited to most or all

- parcs, but to also include more specific indicators/measures that address the unique issues facing each park.
- However, the group agreed that we need to develop a process that will be repeatable elsewhere, so the primary focus should at least initially be on the more broadly applicable indicators.

Lunch: 11:30 – 1:00

1:00 pm Presentation (Steve Cinnamon): Stewardship Strategies and Condition Assessments

- General Management Plans (GMP)
 - long term view for park management that includes public scoping sessions
 - Essentially a contract between the park Superintendent and the Public;
 - Provides a qualitative view of resource desired conditions
- Resource stewardship strategies –
 - Include activities within a management zone to maintain or move resources from existing conditions to a desired condition
 - Attempt to quantify the ‘end points’ of qualitative desired conditions (indicators and attributes, target levels, etc).
- Condition Assessments
 - Use existing information (I&M network) and new information or analysis to develop reference condition of resources
 - Steve stressed that we need to consider the other ‘reports’ that parks will respond to in reporting on land health (e.g., GPRA and OMB reporting).
- Steve then went on to discuss that he sees these assessments as providing critical information to all other planning/management efforts that NPS does; including, General Management Plans, Resource Stewardship Strategies, and the Park Strategic Plans

1:15 pm Presentation (Jeff Albright): Integrating Science into Management

- Jeff started his presentation by discussing why this project and the condition assessments that will result have value.
 - As he sees it these assessments serve to integrate, synthesize, translate a large amount of existing, yet disparate information and data.
 - They will help characterize important park resources, condition status, existing/emerging issues, initial reference conditions and data gaps
 - Results will lead to improved management, resource planning, and performance reporting for NPS
- Jeff then discussed the evolution of natural resource science and policy over the last 10-15 years:
 - On “science” side there has been a push to develop common definitions and increased capability of doing ecosystem-based management
 - On Policy & management side there has been a push for agencies to move to outcome-based management and accountability reporting

- Ecosystem Management: is a structured process for society to define what ecological condition is desired at each part of a region, and to develop and implement management policies designed to achieve that mosaic of desired sustainable ecological conditions (from Harwell et al. 1999).
- Outcome based management: is a process whereby parks define and map their management zones and Desired Conditions (DC's), identify associated measurement indicators/targets; and, take strategic steps to achieve and maintain DC's over time.
- Either way, taking a strategic approach to define, then achieve and maintain a suite of Desired Conditions for park resources & values. Both could be described as "CONDITION-BASED MANAGEMENT"
- Jeff then discussed the balance between societal and science inputs on resource planning and assessment.
 - Greatest societal input is in setting management GOALS
 - Greatest science input is in establishing ENDPPOINTS and MEASURES of assessing how well we are achieving those goals
- Jeff then briefly discussed the EPAs Science Advisory Boards "Framework for Assessing and Reporting on Ecological Condition", stating that it provides a good framework for developing an overall structure to condition assessments.
 - He provided an example for Herbert Hoover National Historic Site
- He then discussed the value of the condition assessments for integrating science into Planning and Performance Reporting
 - All parks can benefit from an interdisciplinary evaluation of currently available scientific data and information
 - Help develop synthesis "information products" that are readily usable by park managers for:
 - **Resource Planning** – to help parks define & map their management zones and NR-related Desired Conditions
 - **Performance Reporting** – to help parks report to the GPRA "land health" goals and OMB "resource condition" scorecard
- Jeff then discussed what he believes are the Three Key Elements to Making the Assessments Useful for Park Planning and Performance Reporting
 - 1. Build upon current park science and planning efforts
 - seek to use data and information already assembled by NPS science-support programs, other science data developed in or near parks, existing planning decisions or mgmt documents.
 - 2. Emphasize a strong geospatial component
 - in terms of the analytical process, and resulting information products.
 - 3. Provide an initial set of reference conditions
 - in a manner that can become more refined and quantitative over time, and help parks define Desired Conditions.
- Jeff then covered the various aspects of NPS Strategic Planning & Scientific Assessments and their relation to one another and also how the condition assessments fit within this broader topic

- Foundational Statement: Describes Park Purpose, Significance and Fundamental vs. Other Important Park Resources & Values
- General Management Plans: (20+ year timeframe) Defines and Maps Mgmt Zones & Desired Conditions (DC's) in qualitative terms
- Resource Stewardship Strategies: (12-20 year timeframe) Identifies Measurable DC Attributes & Targets, Documents Current Resource Conditions, and Outlines Strategy to Achieve DC's
- GPRA and OMB reporting: (1-5 year timeframe) Establishes Near-term Performance Targets
- Condition assessments have greatest influence on RSSs and GPRA reporting, but will also influence GMPs
- Jeff ended his presentation with what he believed was a good strategic approach for developing the analytical framework for the EFMO and ONSR condition assessments
 - Use something like the EPA SAB Framework as the foundation in conjunction with the TNC CAP process
 - Determine what ecological attributes and subcategories we have useful, existing data for
 - Rank most important ecological attributes and subcategories:
 - Determine where the top-20 Vital Signs indicators fit
 - what do the vital signs conceptual models identify?
 - what do the park Significance Statements say about important resources & values?
 - Decide on the role and methods for each subcategory to be evaluated
 - which attributes will be part of characterizing important park resources (e.g. regional significance)?;
 - which will be part of “condition assessment” phase?
 - For subcategories taken into the condition assessment phase: how will we define/apply reference condition?
 - Identify other data/analyses that could strengthen assessment, if these could be brought on line quickly
 - Can and should we use the TNC CAP process?
 - If so, which parts we will use?
 - what are the specific steps?
 - what are the likely products?

1:30 pm Group Discussion: GPRA and OMB Service – Wide Objectives; Establishing Specific Goals and Objectives of the Assessment for each Park

- This discussion started by trying to answer the question: How do we define “significant” park areas or resources?
 - The group agreed there are a number of ways to do this. Could use the General Management Plan (GMP), but the GMP defines things very generally.

- The group agreed that there are lots of things to measure and include in the assessments and that each could point to ‘significant’ areas, yet the big picture may point to something else.
- Cinnamon: The GMP addresses the ‘Whats important’, the Resource Stewardship Strategy (RSS) is the ‘Hows’ of how we will conserve what is important.
- Victoria Grant: Many significant park resources are based on social values that we are placing on top of ecological/scientific processes.
- Sowa: stressed that we need to keep these separate since social values require different measures/analyses than ecological processes. Do the science/ecosystem planning first. Then bring this together with the social/political portion at the end.
- The group agreed that this project needs to focus on the natural and ecological components and not the “serene and simple setting” cultural type idea. We agreed that we need to assess the resources and that each park will have specific ways of using these assessments. However, we also recognized that some parks have significant cultural and historic components while others do not and these must be incorporated to some extent.
- The group also agreed that need to keep in mind that park visitors are one of the threats/stressors, and that we don’t need to be shy about addressing this issue.
- Mike DeBacker: At this point in the project there is definitely some confusion on what the end products will be. Given the limited time and money the products might be simply interpreting and synthesizing a limited set of the most pertinent data sets.

2:00 pm Presentation (David Diamond & Scott Sowa): Multiscale Inventories and Assessments (See presentation handout)

- David began the presentation by illustrating the differences between inventory, assessment, and planning
 - Inventory: To create an itemized list of goods, property, resources, etc.
 - Assessment: To estimate or determine the significance, importance, or value of something (**both good things and bad things**)
 - Planning: The process of setting goals, developing strategies, and outlining tasks and schedules to accomplish the goals
- David and Scott then provided specific examples of resource inventory, assessment, and planning efforts
 - Inventories provide a snapshot in time, however, if done through time provide a means of conducting trend analyses.
 - Examples: NRCS NRI, USFS FIA,
 - Assessments:

- Examples: USGS GAP, TNC Rivers of Life, WWF Freshwater Conservation Assessment
 - A key issue pertains to selecting the geographic framework for your assessment
 - Should be ecologically based and hierarchical
 - Finest resolution should be at a scale suited to local planning and management, not so big they are left with the question of where should I begin on the ground management efforts
 - Conservation Planning
 - Both a geographic and logistical exercise
 - Geographic: Answer WHERE should we focus our efforts
 - Logistical: Answers WHO, WHAT, WHEN, HOW, and WHY questions
 - Examples: Oregon’s living landscape, Florida strategic habitat, Vermont biodiversity project, Cowling et al. S. Africa, Noss et al. Yellowstone NP
- David then discussed TNCs CAP process
 - 1. Identify People Involved In Your Project
 - 2. Define Project Scope & Focal Conservation Targets
 - 3. Assess Viability of Focal Conservation Targets
 - 4. Identify Critical Threats
 - 5. Conduct Situation Analysis
 - 6. Develop Strategies: Objectives and Actions
 - 7. Establish Measures
 - 8. Develop Work Plans
 - 9. Implement
 - 10. Analyze, Learn, Adapt, & Share
 - The EFMO and ONSR assessments mainly fall in steps 2-5
 - He gave an example for the lower MO River CAP
- Scott then discussed the EPA SAB framework for assessing and reporting on ecological condition
 - Developed by EPA Science Advisory Board
 - Guide for developing “report cards” on ecological condition
 - Hundreds of relevant indicators exist
 - Roadmap for synthesizing a large number of indicators into a few, scientifically defensible categories
 - Goals and Objectives are “separate”
 - Essential Ecological Attributes (EEAs) were developed to apply generically
 - Allows for consistent application
 - EEAs are hierarchical and derived from conceptual model of ecological
 - Address ecosystem pattern, composition, and function

- Ecological Indicators (EIs) are measurable endpoints related to EEAS
- Measures are specific variables measured in the field or with GIS data that are then aggregated into EIs
- EEAs have Component categories and Subcomponent categories
 - Component and Subcomponents must be defined for each assessment
- Provided an example of the amazing number of potential EIs
- Pointed out that threats/stressors are kept separate from the EEAs and EIs since there is not a one to one relation. One threat can influence many EEAs or EIs
 - By keep threats separate it helps you to avoid simply focusing on available data since we have much more data on the threats, assessments tend to focus on these as opposed to the ecosystem attributes
- Pros
 - Holistic and detailed
 - Hierarchical
 - Broadly applicable
 - Keeps stressors separate
- Cons
 - Not fully fleshed out
 - Most indicators and measures have not been measured

2:30 pm Discussion on multiscale inventories and assessments

- Mike DeBacker: Because of the small size of the EFMO and ONSR we need to have very small assessment units.
- Scott Sowa: We need to have a hierarchy of assessment units starting with large units for the regional (contextual) analyses and going down to very small assessment units for the within-park analyses. Scott believed that the Segmentsheds should provide enough detail/resolution for the aquatic assessments and that the broader classification units of the MoRAP classification hierarchy (AESs) should work well for the regional analyses.
- Dave Diamond: Not sure what kind of grain size we can get down to on the terrestrial side. He is very interested in working with others to see what is doable.

3:00 pm Presentation (Scott Sowa and Dave Diamond): Relevant MoRAP Projects

- Scott and David provided an overview of several past and ongoing MoRAP projects that could provide valuable input data for the EFMO and ONSR assessments.
- The presentation covered:
 - A Watershed Inventory for Select Watersheds Draining MTNF Lands
 - The Missouri Aquatic GAP Project
 - The Missouri River Aquatic GAP Project
 - Terrestrial Conservation Focus Areas for the Midwestern USA

- Missouri Wildlife Action Plan
- Development of Synoptic Human Stressor Indices Throughout EPA Region 7

4:30 pm Open discussion

- Scott started the open discussion by asking if the group thought the EPA framework would work for this project.
 - Most agreed that it will and that we will have to consider each park separately.
 - The group also agreed that the EPA framework is essentially “all inclusive” and that we will not be able to do everything or even close everything they include in the framework.
 - We must agree and decide on what we can realistically do, which will involve establishing information/data/end product priorities.
- Scott said he thought it would be a good idea to select and prioritize the categories and subcategories for each of the EEAs in the EPA framework on day 2 and possibly add to them if necessary.
 - The group also agreed that must determine what data is actually available for each category and subcategory and where we can get it
 - Along these lines there are really two data gathering issues
 1. What the parks have
 2. What is available for the broader ecosystem
 - However, Scott pointed out that we should first focus on developing an idealized framework that includes all of the attribute categories and subcategories that we believe are necessary to conduct comprehensive condition assessments for each park. Then subsequently identify those for which little or no data are available. Identifying critical data gaps is part of the project.
- Dave Diamond: wondered how completing handout with EEAs, EIs, and data sources would help us get to an end product? He said that some things may get ranked as important and desired, but we don’t have data for it. Scott said that those instances are important to note for reporting purposes.
- DeBacker, Cinnamon, Albright: Stressed that the assessments are not just based on GIS data, although the GIS component is critical, we also need to include other existing field data such as those being collected by the I&M program.

5:00 pm End of Day!

DAY 2

Thursday September 7, 2006

8:30 am Start of Day 2

- Morning was spent going through EPA framework to:
 - Select and prioritize the Categories and subcategories under each of the six Essential Ecological Attributes.
 - Begin the process of identifying baseline or desired conditions for each
 - and identifying data needs and sources for each.

- The last part of the day focused on a discussion on what the final product should be:
 - There were several issues brought up during this discussion
 - Ultimately we need park-specific syntheses
 - The managers need an assessment that can assist them with writing their plans and reports.
 - Essentially we need to illustrate a “Proof of concept” surrounding many of the fundamental components of these assessments
 - The appropriate geographic framework
 - Influence of grain and extent
 - Resolution is an issue to think about i.e. what is useful for a small park vs. what is useful for a big park.
 - For smaller parks probably will want to use the soils polygons as an assessment unit; 30 meter grid cells may be too small. Victoria says that in narrow linear-like parks the 30 cell resolution will not always be ideal either.
 - - The appropriate or minimum set of ecological parameters
 - The influence of different analytical approaches to synthesizing the data
 - Best way to report the various data
 - Data gaps
 - Baseline data will be the most difficult thing to get. We will have to state that we have present day data of X, but nothing to compare it to.
 - It was also discussed that terminology and the way we state things, i.e. “wording” is important. We don’t give the wrong impression to the public about the condition of the resources in the parks or their influence on the condition.
 - The workshop ended with a discussion of the next steps for park personnel and MoRAP staff.
 - MoRAP staff stated that they need geospatial data on land use, soils, and management zones right away.

- Dave and Scott said they would work on finish filling out the EPA form and would then send that out to the group to get further feedback from NPS staff on prioritizing the categories and subcategories, developing quantitative or qualitative desired conditions, identifying developing ecological indicators, and selecting specific measures for each.

3:30 pm End of Workshop