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Forest Service

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Business Requirements Modeling of The Project Level NEPA Process

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LEAD AUTHOR:

Bob Lee, USDA Forest Service, Inventory and Monitoring Institute

Contributing Authors:

Tom Hoekstra, USDA Forest Service, Director, Inventory and Monitoring Institute

Matt Turner, USDA Forest Service, Inventory and Monitoring Institute

Ann Morrison, Business Genetics



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Executive Summary

In July 2001, Forest Service Chief Dale Bosworth began an initiative to evaluate the sources of “process gridlock” or the inability of District level staff “to do the work that we know needs to be done because of unnecessary and unproductive process and procedures”. The Inventory and Monitoring Institute together with BusinessGenetics, a private consulting company, engaged in a business process modeling effort in order to portray the complexity and impact of environmental laws on National Forest level project planning. The models were developed in 3 stages: an initial model based on Forest Service Handbooks, a second model based on the NEPA statute and regulations and a third model developed by merging the models from the first two stages. Each model provides clear visual evidence of the complexity of the project planning process and served as a tool for further evaluation of the Forest Service’s “process gridlock”.

Project Description and Chronology

The Initial Project Planning Business Model

In August 2001, BusinessGenetics and the USDA Forest Service Inventory and Monitoring Institute (IMI) began development of a business WHAT model of a Ranger District level project planning process. A WHAT model is designed to represent all possible activities that may be performed in order to accomplish a single overall objective. More specifically, BusinessGenetics was asked to focus on activities and workflows performed at the District level in order to comply with all environmental laws applicable during project planning. BusinessGenetics worked with Subject Matter Experts (SMEs) from IMI and the USDA Forest Service Pike and San Isabel National Forest, South Platte Ranger District to produce a set of business models that displayed these activities and workflows. A recently proposed timber sale associated with the Upper South Platte Watershed Protection & Restoration Assessment was used as a case study.

The statutes that were modeled, together with their prospective implementing regulations and policy directives, included:

- National Environmental Policy Act (NEPA)
- National Forest Management Act (NFMA)
- Endangered Species Act (ESA)
- Clean Water Act (CWA)
- Clean Air Act (CAA)
- National Historic Preservation Act (NHPA)

The analysis also considered requirements outlined in FSH 1909.15 *Environmental Policy and Procedures Handbook*), FSH 2409.18, *Timber Sale*

Preparation Handbook and FSM 7712.1, *Roads Analysis*. The final activity model contained over 800 potential activities needed to comply with all the environmental laws listed above during the project planning process. A rough version of a business process *activity* model was constructed at the end of this phase of the modeling project in order to show all potential interactions and activities triggered by other environmental laws during the NEPA environmental analysis process. A graphical representation of the activity model can be accessed using the following link:

http://www.fs.fed.us/institute/bus_mod/District_Compliance_Business_Model.pdf

The results of the initial modeling effort were used in partial support of the Chief's testimony on "process predicament" (aka "analysis paralysis") before the House of Representatives Subcommittee on Forests and Forest Health in December 2001. The study was also used as an example of how procedural delays are stalling critical forest management projects in President Bush's report "*Healthy Forests – An Initiative for Wildfire Prevention and Stronger Communities*" (August 22, 2002). The initial District level business modeling effort was documented in a report prepared by BusinessGenetics, "*Reflecting Complexity & Impact of Laws on a USDA Forest Service Project*" (October, 2001). The report can be accessed using the following link:

http://www.fs.fed.us/institute/bus_mod/initial_district_model_report_abstract.pdf

The NEPA and CEQ Regulations Models

The results of the initial District level project planning model were presented to the President's Council on Environmental Quality (CEQ) staff in October, 2001. Following the presentation, CEQ requested that additional business modeling be applied to the NEPA statute and the CEQ's regulations for implementing the procedural provisions of the NEPA (40 CFR Parts 1500 – 1508).

The CEQ and the Forest Service jointly undertook this modeling project through a contract with BusinessGenetics. The modeling effort was designed to focus on the activities that all Federal agencies needed to perform in order to comply with the NEPA statute and the NEPA regulations. Business activity models for the statute and regulations were developed during a series of workshops held between December 2001 and June 2002, in Washington, DC. BusinessGenetics facilitated the workshop and developed the models using the same process used to develop the Ranger District project planning model. Subject matter expert's (SME's) involved in the workshops included representatives from the CEQ and the Forest Service's EMC and IMI staff.

The project focused on creating a foundation for an objective evaluation of the NEPA regulations and a benchmark for comparison against the District project planning models developed initially. The models were not intended to be a legal

interpretation of the NEPA regulations. The modeling workshops included some good discussions and effectively provided for a facilitated consensus between CEQ and FS representatives on individual business activities represented in the NEPA statute and regulations. In general, the final CEQ regulations model was organized differently than the actual regulations published in the Federal Register version and reflects four primary groupings of activities found in the regulations:

- Responsibilities to support an agency's capability for compliance such as establishing Agency-wide procedures
- Management considerations to facilitate NEPA compliance during implementation at the program and project levels
- Process requirements and criteria to ensure NEPA compliance during implementation at the program and project levels
- Responsibilities unique to the CEQ and the Environmental Protection Agency.

The modeling effort was iterative and provided for consideration and consolidation of redundant business activities as each version of the activity model was developed. Each activity identified was coded with a specific color based on the original section of the statute or regulations from which they were drawn. The color coding helped to visually keep track of the exact source of each activity as the model was re-structured through each iteration and provided for some common discussion points for key concepts in the statute and regulations.

In the final version of the model, the workshop members classified each activity as *Required*, *Situational* or *Optional*. *Required* activities were considered non-discretionary and must be performed as a part of any NEPA process. *Situational* activities were considered non-discretionary under certain conditions. *Optional* activities were considered totally discretionary.

The models were finalized in June, 2002. Copies of the model were provided to CEQ's NEPA Task Force established in May, 2002 to review the current NEPA implementing practices and procedures being used by Federal agencies. The results of the modeling effort were documented in an IMI report entitled, "*Workshop Summary – Business Activity Modeling of the CEQ's NEPA Regulations (40 CFR 1500-1508)*" and issued in October, 2002. The report and the actual models can be accessed using the following link:

http://www.fs.fed.us/institute/bus_mod/ceq/

The Final Business Activity Model – Merging the NEPA, CEQ Regulations and District Level Models

The final stage of the project began by comparing the CEQ NEPA model to the original District project planning NEPA model. The District model was evaluated to determine which activities were redundant with activities identified in the CEQ NEPA model. The District model was then updated using the exact process requirements activities found in the CEQ NEPA model. Concurrently, activities in the District model that could not be linked to a requirement in NEPA or the CEQ regulations were categorized and color-coded as being from a Forest Service Manual or Handbook, informal policy or direction or induced by District level staff in order to complete the project planning process. Using the color-coding approach, the model could be quickly perused to determine which activities were discretionary and therefore, open to modification or elimination in order to simplify the project planning process. The final District Level NEPA Project Planning Model can be viewed at:

http://www.fs.fed.us/institute/bus_mod/

Information or WHICH Model

The final activity model was used as the basis for constructing a *business process WHICH model*. The WHICH model displays all of the information needed to complete each task in the business activity model and the product of each activity as appropriate. IMI staff constructed a rough version of a WHICH model to serve as a starting point for a workshop involving District level SME's. In October, 2002, a two day workshop was held with staff from the South Platte Ranger District, the Boulder Ranger District and the Arapaho-Roosevelt National Forests Supervisor's Office. The objective was to focus on the public scoping and environmental analysis stages of the NEPA process and identify which types of information were needed to complete the activities identified in the WHAT model. Workflow relationships were also built into this model and used to further validate the original activity model. Some changes were made to the WHAT model as a result.

A list of potential resource data and information needs was created as a result of this stage of the business modeling (see Attachment C).

Findings and Recommendations

The report submitted to the Chief's office in November, 2001 on the initial business modeling effort contained several findings.

- The business/workflow models indicate considerable impacts in terms of time and costs during the planning phase of a project, with a significant number of those impacts reflected in the environmental analysis phase.

- Process interaction between laws is extremely complex. For each additional law that must be considered for any given process, the complexity becomes exponential
- The business/workflow models highlight the considerable complexity caused by the interactions among the laws that govern environmental analysis within project planning.
- The business/workflow models indicate the potential for interruptions in the project analysis/decision making process by other State and Federal agencies with environmental regulatory authority.
- The business/workflow models indicate the need for intricate synchronization of the independent processes called for by each environmental laws, which causes additional complexity in the implementation of these laws within the project planning process.

A complete set of the preliminary findings can be found in the report, "*Reflecting Complexity & Impact of Laws on a USDA Forest Service Project*" (October, 2001).

http://www.fs.fed.us/institute/bus_mod/initial_district_model_report_abstract.pdf

As a result of the analysis, the Forest Service and BusinessGenetics team identified the following future options for consideration:

- Complete the business process modeling effort.
- Review / Revise the Directives System.
- Use formal business modeling approach to proactively support development / maintenance of legislation and directives.
- Further analyze the need for a two-step decision-making process with multiple associated NEPA analyses (in both the forest planning and the project planning efforts).
- Use information technology to support the definition, compliance and implementation of laws.

During the workshops with CEQ to build a model of the NEPA regulations, there were some observations that were shared by most members of the group:

- Policy direction relevant to specific activities required by NEPA, such as alternative development, is distributed throughout different sections of the regulations including the "Definitions" section.
- The current content of the regulation is not organized as a procedural guide for NEPA implementation. Instead, the current regulation is

primarily a collection of selected guiding principles such as; reducing paperwork, reducing delay, providing for timely and appropriate consideration of NEPA policies, and emphasizing public involvement and significant issues.

- The regulations speak primarily to the development of EIS documents and allow agencies to develop their own direction on the appropriate process for developing an Environmental Assessment (EA) document.
- The NEPA regulation offers flexibility in compliance by allowing for optional and situational activities along with specific required activities.

In addition, the workshop discussions identified some possible implications given the current organization of the regulations and the Forest Service's compliance with NEPA requirements:

- The structure of the NEPA regulations, while seemingly desultory, is not unusual compared to other Federal regulatory direction. Some interpretation and implementation issues are left to the Agencies to resolve, consequently, creating an environment for project-specific interpretation and potentially inconsistent implementation between Federal agencies.
- Agencies have the discretion to apply NEPA in ways that best reflect their unique decision-making processes and management systems because of the authority to establish their own policies on the use of Categorical Exclusions and Environmental Assessments.
- *Optional* and *Situational* activities add complexity and length to the regulations while providing flexibility during implementation. This flexibility allows for different interpretations, and potential inconsistencies, between agencies.
- Specific direction on what constitutes a "major federal action significantly affecting the quality of the human environment" is left to the agencies to develop for their particular decision-making processes, management systems, and environmental issues.

Merging the CEQ NEPA Regulations model with the original District model resulted in a extremely large and complex model. There were several more findings made as a result of this final step in the business modeling process:

- Considering just the NEPA process alone, roughly 650 potential activities were identified in getting to the point where an actual decision on a proposed action is made.

- Over 270 activities were identified prior to actually conducting an environmental analysis and many of these activities could have to be completed even if a Categorical Exclusion is used for a proposed project.
- For an Environmental Assessment, about 400 potential activities were identified up to the point where a Decision Notice is issued. About 240 of these activities are based on Forest Service Handbook direction or are discretionary based on the procedures followed by NEPA coordinators in the field.
- Using an Environmental Impact Statement to support a decision on a proposed project may result in over 500 activities being performed before a Record of Decision is signed. Similar to the EA process, about 240 of these activities are based on Forest Service Handbook direction or are discretionary based on the procedures followed by NEPA coordinators in the field.
- The difference between the number of potential activities identified for an EA when compared to the number for an EIS is relatively small (around 100 activities), whereas the difference between an EA and a CE is relatively large (about 300 activities).
- There is considerable potential for developing a more streamlined EA process that would serve as a more efficient substitute for an EIS.

Overall, the development of the business process models was successful in providing an objective analysis of a typical District level project planning NEPA process. Clearly, there can be no argument that the process is complex and in need of reform and streamlining. The final model is so large and complicated that there is no user-friendly way to show the models other than through large scale plots of the models.

The final NEPA model could be used as a training tool or as a way to highlight the areas where the Forest Service can make improvements in the project planning process. Ultimately, the next logical step in the business modeling process would be to develop "TO BE" models of the NEPA project planning process including a detailed analysis of all the other environmental laws in order to present a more comprehensive and efficient "systems approach" to environmental analysis. The results of further modeling could provide a context for integrating all environmental laws that impact the Forest Service in managing the resources entrusted to the Agency.

Attachment A - References and Web Sites

USDA Forest Service Inventory and Monitoring Institute

<http://www.fs.fed.us/institute/>

BusinessGenetics

<http://www.businessgenetics.com/>

FSH 1909.15 – Environmental Policy and Procedures Handbook (NEPA), USDA Forest Service, September 3, 1993.

<http://www.fs.fed.us/im/directives/fsh/1909.15/>

FSH 2409.18 – Timber Sale Preparation Handbook, USDA Forest Service, , March 5, 1999.

<http://www.fs.fed.us/im/directives/fsh/2409.18/>

Endangered Species Consultation Handbook, U.S. Fish & Wildlife Service and National Marine Fisheries Service, , March 1998

<http://endangered.fws.gov/consultations/s7hndbk/s7hndbk.htm>

Roads Analysis, USDA Forest Service, August 1999.

<http://www.fs.fed.us/news/roads/01titlemain.pdf> - xml=<http://www.fs.fed.us/cgi-bin/texis/s>,

“Northern and Intermountain Regions – Line Officer NEPA Checklist”,

<http://www.fs.fed.us/forum/nepa/loc.htm>.

“Environmental Assessment Checklist”, OIG Report #08801-10-At.

“Pike and San Isabel National Forests Cimarron and Comanche National Grasslands, South Platte Ranger District”, USDA Forest Service,

<http://www.fs.fed.us/r2/psicc/spl/>.

Quick Links to Graphical Representations of each model

- CEQ NEPA Regulations Model – URL
http://www.fs.fed.us/institute/bus_mod/ceq/
- HOW Model for Environmental Law Compliance - URL
http://www.fs.fed.us/institute/bus_mod/District_Compliance_Business_Model.pdf

Attachment B - Participants in the Modeling Process

USDA Forest Service

Chief's Office

Tom Hoekstra –Director, IMI
Joe Carbone – NEPA Coordinator, EMC
Matt Turner – Analyst, IMI
Bob Lee – Analyst, IMI
Sarah Hall – Analyst, IMI

Pike and San Isabel National Forest, South Platte Ranger District

Fred Patton – Planner, NEPA Coordinator
Jim Thinnes - Forester
Steve Culver – Wildlife Biologist

Arapaho and Roosevelt National Forests

Ken Tu – Forest Planner, Supervisor's Office
Mark Martin – NEPA Coordinator, Boulder Ranger District

Council on Environmental Quality

Edward Boling – Staff Attorney

Private Consultants

Cedric Tyler – BusinessGenetics
Ann Morrison – BusinessGenetics
Rob Smith – BusinessGenetics
Brad Piehl - Foster Wheeler Environmental Corporation)

Attachment C – Data and Information Needs

AIR

- air disturbing activities
- air quality standards
- air shed map
- climate
- prevailing winds
- inversion potential

RANGE

- allotment management plans
- noxious weed spread
- permitted use
- range Condition
- range improvements
- forage Condition
- utilization (livestock / wildlife)

FISHERIES

- aquatic fauna
- threatened & endangered species list
- Management Indicator Species list
- population data
- hatchery fish vs. wild fish
- Aquatic fauna habitat type
- riffle pool glide
- stream cover
- migration barriers
- Aquatic fauna BE/BA

ECONOMICS AND SOCIAL

- Adjacent Private Property value data
- Benefit/cost ratio
- Jobs and Income
- Census block data
- minority and low income groups
- Social Habits
- Economic Base of Local Communities
- Potential agency expenses
- Value of agency infrastructure
- Forest products outputs

CULTURAL/HISTORIC

- Cultural resource surveys
- Cultural / Historic Properties
- Eligibility for National Register of Historic Places
- Analysis area maps for cultural and historic resources
- Location of Pre-historic/Historic Sites
- Location of Traditional Native American Use Sites

SOILS

- Soil surveys
- soil compaction
- soil displacement
- soil erosion
- soil puddling

RECREATION

- Recreation Capacity
- Recreation Use
- Recreation Capacity
- Outfitter and Guide Map
- Locations of Dispersed Recreation Sites
- Analysis area maps for recreation
- ROS Map
- Locations of Developed Recreation Sites
- Recreation Use in Effected Area

HYDROLOGY

- Riparian/Wetlands Conditions
- stream morphology
- water rights
- Floodplain map
- Existing pollution sources
- Soil erosion
- Precipitation
- Beneficial uses
- DEM (digital elevation model) map
- Stream map
- Wetland / riparian map
- Existing vegetation
- Water quality parameters
- Transportation system
- Water quality standards
- Soil survey maps
- Uses (recreation, grazing)
- Water allocation (watershed scale)
- Municipal Watersheds
- Analysis area map
- Watershed maps
- Past treatment information
- morphological characteristics
- substrate characteristics
- stream classifications
- basin morphometrics

WILDLIFE HABITAT

- US Fish & WL /State Recovery plans
- Forest products outputs
- Stand composition
- Stand Structure
- Riparian/Wetlands Conditions
- Uses (recreation, grazing)**
- landscape Diversity
- Listed T & E Species
- Transportation system***

- Sensitive Species List
- Analysis area maps for wildlife
- Existing Fragmentation
- Habitat maps
- wildlife BE/BA
- wildlife viability
- wildlife populations
- calving areas
- nesting sites
- breeding habitat

ROADLESS AREAS

- Inventoried roadless area map
- Roadless characteristics (as defined in roadless rule)
- Permitted Use

SCENERY

- Landscape Diversity
- Visual Quality Objectives
- SMS (scenery management system)
- EVC (Existing Visual Condition)

VEGETATION

- Stand Structure
- stand composition
- Botany BE/BA (biological assessment)
- TES plant mapping
- Pre-settlement vegetation pattern
- structure
- volume
- canopy closure
- basal area
- Noxious weed maps

WILDFIRE HAZARD

- fire hazard
- Potential natural vegetation map
- Fire history
- Uses (recreation, grazing)
- Fuel Conditions
- Forest vegetation maps
- Past treatment history

CUMULATIVE EFFECTS

- Area of impact (watershed, habitat type, etc.)
- Other ownerships - BLM, State, county, private boundaries
- NFS land boundary
- Activities occurring /planned/ foreseeable (what & when)
- Pre-settlement vegetation pattern
- Past treatment information**
- Existing pollution sources
- Forest vegetation maps
- US Fish & WL /State Recovery plans
- Habitat maps
- Effects on individual resources
- Existing vegetation**

Watershed maps
Fire history

MISCELLANEOUS

Analysis area map*
proposed Action and Alternatives
All available mitigation measures
Best Management Practices
Existing pollution sources
Issues
Names and addresses of respondents to the scoping statement
Analysis & Evaluation Criteria
Analysis protocols
past experience of similar projects
Assessments
Landscape assessments
Forest Plan direction
National / regional NEPA direction
New insights/information
Recent Appeal decisions
Recent NEPA case law
Roads Analysis
Applicant Information
Assessment of reliability and accuracy of existing data
current data/information gaps
Risk assessment (Appeals/litigation)
Survey protocols
Available technologies
Budget
Consultation requirements
Documentation requirements
Environmental review requirements
Political climate
Similar actions
Time limits
District mailing list
Scope of the NEPA analysis
Scoping statement
Expertise and experience of the staff