NatureServe VISTA

Decision-Support Software for Land Use and Conservation Planning

The NatureServe Vista 2.0 Process: A Guide to Soliciting Expert Input

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NatureServe

www.natureserve.org/vista

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1. INTRODUCTION

This guide is provided to assist project managers/working group leaders in obtaining and compiling much of the information that a NatureServe Vista project requires. A general overview of the Vista approach is provided in Appendix 1 that you may wish to pass on with the instructions to experts; additional data requirements and guidance are provided in Vista's documentation and getting started guide. Our intention with these guidelines and instructions is to make your conservation planning more rigorous and informative for the decision making process. In the following sections, we present the general process for collecting *inputs*: raw data, documentation on raw data and expert comments on the raw data and documentation that have been solicited and received.

Section one and two will be helpful for the project manager or project team to understand the NatureServe Vista 2.0 planning methods. Sections three through six provide instructions for experts to inform and guide their input as well as guidance for project managers; these instructions are designed to be customized by project managers to fit the specifics of their projects. Instructions to project managers in those sections are highlighted in yellow.

This document is designed to accompany two spreadsheets: *conservation element inputs* and *land use type list*. Both are located in the "expert inputs.xls" document. The *land use type list* provides space to create a land use type list based on threats to natural communities and opportunities for conservation. It also contains columns for creating and tracking suggested metadata for the project. *Conservation element inputs* contains a matrix for listing all conservation elements for the project area (rows) and all of the conservation requirement inputs (columns). The purpose of the spreadsheet is to gather and document all of the conservation elements and their requirements that will be input to the NatureServe Vista database.

2. PROCESS OVERVIEW FOR COLLECTING EXPERT INPUT

A central component of the NatureServe Vista process is the collection of expert input on an appropriate land use classification for the project, the conservation elements (e.g., species, ecosystems, and cultural features of value), and the best sources of data and conservation requirements for the conservation elements. Because your NatureServe Vista project requires expertise in the variety of conservation elements and the types of planning or assessment for your project, you will need to ask for assistance from a variety of experts as you gather the information and data necessary to implement your project. Typical experts engaged include, but are not limited to:

- Biologists (e.g., zoologists, botanists)
- Ecologists (including freshwater if part of the project)
- Experts in any cultural features to be included
- Planners and or natural resource managers
- Policy/strategy/economics experts

We encourage project managers to ask for input from experts only for their areas of expertise. Specifically, you'll need expert help to:

1. Assist in creating the analytical and planning workflow of Vista appropriate to the project and identify any additional tools and approaches to be applied in conjunction with Vista.
2. identify appropriate conservation elements for the project region and purposes,
3. identify the best available data to be obtained/applied, and
4. create a project classification of land use and policy types (customizing the default lists in Vista)
5. specify key conservation requirements of conservation elements such as minimum occurrence size and retention goals,
6. categorize how conservation elements respond to each land use type,
7. optionally, construct condition models for element response to land use types,

Expert input is desirable or necessary for a variety of Vista inputs. Many of these inputs can be gathered simultaneously or at different times during the project; however, the most efficient use of experts' time requires some basic sequencing of input gathering. We suggest the following sequence (assuming the project scope and expert groups have been defined) for the tasks that have sequential requirements:

1. Establish the list of conservation elements to be considered
2. Concurrently develop the draft land use and optional policy type classification. Note that policy types can be modified at any time without ramification of expert input but if land use types are changed, those changes must be submitted to all element experts to establish element response to them. For that reason it is strongly encouraged to put ample consideration into the land use type classification so that element experts do not need to be reengaged.
3. Have element experts review the land use type classification to ensure it is sufficiently, but not too detailed for setting element responses and finalize the classification
4. Have the element experts establish the element conservation requirements and responses to land uses

To make the expert input process clearer for the reviewers, we suggest that you provide the following information to all reviewers. Some of the components listed below will be very project specific (and are indicated so) and will require you to develop them, other components are more general and can be adapted from the sections provided in this document.
An example expert input package should include the following:

1. **Process Overview**
    a. Project description and contact information (project specific)
    b. Overview of the knowledge gathering process
2. **Data and Methods Summary and Review**
    a. Depending on how the project is set up, a list of data to be used in the assessment with metadata (e.g., source and scale) for each data set (project specific)
    b. Instructions for experts to review and comment on data
    c. Instructions for completing the expert inputs.xls worksheets
    d. Supplementary information about NatureServe Vista biodiversity and conservation planning approach
3. **The "expert input" spreadsheets: Conservation Element Inputs and Land Use/Policy Worksheets**

a. A data form, provided as an excel spreadsheet, for customizing the generic land use and policy type categorization
b. A data form, provided as an excel spreadsheet, to complete for elements in your experts' areas of expertise

Allow plenty of time for this process. While the information requests are typically not extensive for any particular expert, the logistics of identifying experts, securing their commitment, and implementing the knowledge gathering process at times the experts are available typically takes 3 or more months (especially when experts are donating their time).

2.1 Soliciting information remotely or through a workshop?

There are generally two ways in which NatureServe Vista projects solicit expert input: through workshops or through questionnaires. Not uncommonly, a combination of both techniques will be used. Below, we provide more information on the two methods. The decision to solicit information remotely or through a workshop will depend on your project's budget, time frame, and cultural and logistical factors. Soliciting expert input remotely can be done using mail, email, or an interactive online tool (though keep in mind at this time that all information, regardless of how it is collected, will need to be manually entered into Vista). Many NatureServe Vista projects rely on at least one workshop that will bring many experts together in one location. The advantages of this are many; experts can discuss the project in a structured environment and ideally they can reach consensus on certain issues. This kind of discussion, debate, and conclusion often strengthens the quality of the input as well as invests the reviewers in the outcome of the process. An excellent description of the expert input process including benefits, limitations, and pitfalls can be found in "Drafting a Conservation Blueprint" by Craig Groves (Groves 2003).

When contacting experts remotely, be sure to contact them in a timely fashion and clearly state when you would like a complete review returned. If the reviewer is unable to participate ask them to let you know as soon as possible. If possible, suggest that they recommend another person with similar expertise. Alternatively, if you are gathering this information in a workshop setting you may wish to take steps to capture well-considered input at the workshop and make the best use of time within the short confines of the workshop setting. To do this, we suggest that experts fill out the worksheets in advance including documentation for their inputs.

Regardless of the method for collecting expert input, the purpose of this process is to ensure that the highest quality information is used in the project and to support ongoing work into the future.

3. THE KNOWLEDGE GATHERING PROCESS:

[Project Manager: note that the following instructions are provided in a form suitable for incorporating into your communications to experts. The purpose of these instructions are to introduce the methods used to capture feedback on the land use/policy, ask experts about missing data or limitations and request input on conservation elements (or a subset of elements). Instructions for Project Managers that should be reviewed and then deleted before passing on to your experts are in the form provided here: bracketed and highlighted in yellow].

3.1 Overview of the Knowledge Gathering Process

NatureServe Vista software is used to capture data and expert inputs and then to use that information to conduct a large number of analyses and support assessment and planning. The following instructions are provided to the experts to facilitate that input. An overview of the Vista approach is provided in Appendix 1 and additional information is available on the NatureServe Vista website, www.natureserve.org/vista.

What are we asking from experts?

We would appreciate help from experts for three different components. First, we would be interested in any suggestions you may have for customizing the generic categorization of land use and policy types for local/regional application. Key considerations for this question are:

- Are there any land uses or policy types missing?
- Are there types that will never occur in this region and can be deleted?
- Should some of the land use types be subdivided to recognize important differences in how they are expressed on the land and or affect the conservation elements?
- Should the policy types be separated, in particular by jurisdiction to reflect differences in how they are enforced so we can distinguish reliable from unreliable policies?
- Are there important funding sources or other implementation mechanisms that should be in the policy type list to support creating mitigation or alternative plans?

Second, we need to establish the list of conservation elements to be included in the project and specific conservation requirements for each element to support the assessment and planning analyses. This information should be entered into the accompanying spreadsheet "expert inputs.xls." Specific inputs required include:

- The common name and if applicable, scientific name for each conservation element recommended for inclusion.
- The minimum occurrence size (patch or collection of interacting patches) of an element below which it should not be considered viable and count toward goal achievement (see goals below).
    - If the element occurrence should be characterized as a group of distinct but interacting patches, what is maximum separation distance between those patches to be considered part of the same occurrence?
- The response of each element to each land use according to the project response categories. Imagine that the element and land use coincide spatially- what effect would that land use have on the integrity or quality of that element? [Project Manager: insert response categories here e.g., negative, neutral, beneficial. Note that the project may ask experts for suggestions on alternative response categories but this should be done in advance of requesting element responses to land use types.]
- The retention goal for each element in the planning area. [Project Manager: note that the project may decide to use more than one goal such as a minimum below which the element is expected to be lost and a preferred goal representing robust metapopulations and good ecosystem function. Please modify this section and the input spreadsheet to reflect if more than one goal is being requested]
- Categories associated with the element. [Project Manager: note that categories are optional and the project should determine if categories will be used and if so which category systems. At a

minimum it is recommended to specify the "element type" category (e.g., ecosystem, bird, mammal, reptile, insect, etc.).]

- A landscape condition threshold below which an element's occurrence would be considered non viable and not contributing to retention goals. [Project Manager: note that landscape condition modeling is optional in Vista but if it is to be used in the project, experts need to provide a condition threshold for each element and participate in development of the condition model parameters, usually in a separate exercise.]

Third, we need expert input on whether the data described in the provided documents are, in your estimation, current, appropriate, and likely to provide the best assessment within the scope of our project. Specifically, please consider:

- Are there other data sources we are missing?
- Are the data that have been assembled the best available for the area and specific purposes?
- Are there data limitations that should be noted regarding application of particular data sets to the scale and purposes of this project?

4. Instructions for Experts to Review and Comment on Inputs & Data Sources

[Project Managers: This optional section provides instructions for obtaining peer review of the inputs and data sources gathered by the experts and project team. This step provides a "touch-back" for experts to respond to what has been populated in the spreadsheets that will be incorporated in the NatureServe Vista project. This step is especially important if expert input was not gathered in a workshop or if you are soliciting comments from experts who were not participants in the creation of the draft "expert input" spreadsheet. If you wish to obtain a deeper review of the spatial data sets that have been identified, you may wish to prepare a separate spreadsheet with key metadata information.]

Please use the provided spreadsheets to provide peer review of the information collected from the expert/project team. You may add a comments column after each input for which you have input. We are particularly interested in whether the data identified represents the best available for the area, if other good sources of spatial data are available that are not included on this list, and if you are aware of any limitations that should be placed on the use of certain data sets. We are interested in your thoughts on both the conservation element and land use / land use policy data sets. If you have questions about completing them, please contact [Project Manager: *insert project manager or technical contact name and email/phone*]. Thank you for your assistance.

- Do you concur with the conservation requirements and element responses to land uses?
- Do you concur with the land use and policy type lists?
- Are you aware of data sources for any of the conservation elements or land uses for which a data source has not yet been identified?
- Are there data sources we have missed for other elements or land uses?
- Are the data we have assembled the best available for the area and specific themes?
- Are there data limitations that should be noted regarding application of particular data sets to the scale and purposes of this project?

5. Instructions for Completing the "Land Use Intent & Policy Type List" Spreadsheets

[Project Managers: The "expert inputs.xls" contains three spreadsheets, one for documenting conservation elements, another for modifying the land use intent classification, and the third for modifying the policy type classification. The purpose of these spreadsheets is to collect and manage the information to be incorporated into the project. This section describes the instructions for creating the project classifications (lists) for land use intent and optionally, policy type that are used to define scenarios in Vista. The conservation element experts will require the land use intent list in order to complete the element input information; policy types can be modified at any time without significant impacts to project management. Before you begin to classify land use types, it is important to have defined the scope, time frame, and geographical limit of the study area so that your experts will have a basis for determining which land uses and policy types are likely to occur in the project region. If policy types are not to be used then modify the following instructions to remove reference of that input.]

Land use and policy information is used to depict different scenarios in NatureServe Vista that then are used to assess whether element goals will be achieved under any particular scenario. An initial or baseline scenario may simply reflect what land uses are currently in effect and policy information would help distinguish the likelihood they would remain as is (e.g., current open space lacking a reliable conservation policy). Adding future land use and land policy information will create alternative future scenarios such as an allowable/build out scenario, trends based on market conditions, proposed projects, and climatic and ecological trends such as sea level rise, wildfires, exotic species invasions, etc. Good land use and policy information will consider future (or planned) land uses.

Land use is critical to evaluate the physical impact on elements while policy types are used to determine the reliability of the land use types to actually be implemented. The incorporation of policy information is most useful for projects covering a mix of jurisdictions where reliability of policy enforcement may be an issue for element goal achievement should more intensive land uses be implemented than are reflected in land use plans. Policy types are also very useful for determining if overlapping features in different scenario input layers should be combined or if one should be dominant over the other (e.g., national law will take precedence over local law, etc.).

NatureServe Vista includes a mechanism that facilitates the integration of a large amount of land use data from multiple sources into one common classification. The starting classification provided in Vista is derived from the *IUCN-CMP Unified Classifications of Direct Threats and Conservation Practices* (see http://www.conservationmeasures.org/CMP/IUCN/Site_Page.cfm). That starting classification can be modified to make it more specific and responsive to your project purpose and types of conservation elements. The *Unified Classifications* are a standardized classification of anthropogenic activities or processes which currently or could potentially damage or promote conservation of species, natural communities or ecosystems (IUCN-CMP 2006). In the "Land Use Type List" tab, we provide the current names and codes and columns for you to modify or add land use types and definitions; in the "Policy Type List" tab, you may modify the default policy list. Where codes are provided, these describe documented types in the IUCN-CMP classification and you may read the definitions online or download the documents. [Project Manager: you may also want to provide the documents with these instructions]

Keep in mind, while we use the terms "land use" and "policy type," Vista is very flexible for you to input any mappable, physical phenomena as land use types provided that the element experts can define how

elements respond to them. This may include things like exotic species invasion or sea level rise. Likewise for policy types, you may include items like funding sources or natural succession processes.

In the next section we'll go into more detail about the conservation elements and their response to the different land uses.

6. Instructions for Completing the "Conservation Element Inputs" Spreadsheet

[Project Managers: The "expert inputs.xls" spreadsheet provided with this package contains a matrix ("conservation element inputs") for listing all conservation elements for the project area (rows) and the entire conservation requirement inputs (columns). The purpose of the spreadsheet is to gather and document all of the conservation elements and their requirements that will be input to the NatureServe Vista database. It is important during the project scoping period to determine the types of conservation elements that will be considered. At the most basic level these can be grouped as ecological/biodiversity elements, cultural elements, and land use elements. Our instructions are oriented to ecological elements but they are applicable to all elements. Please revise the expert instructions to reflect the scope of elements desired in the project.]

6.1 Instructions for Experts to Comment on the "Conservation Elements Inputs" Spreadsheet

Filling out this spreadsheet requires a number of inputs and preferably, documentation of information sources or otherwise the justification for the inputs that are added. When filling in land use responses, please make sure that a value is entered for each cell in the element record. This will avoid confusion about whether a blank cell represents and "unknown" response or was overlooked. Note that in assigning element responses to land uses, you need not consider the size of an element's area impacted—the Vista analyses will conduct the spatial analyses in combination with the minimum occurrence size that is provided to take this into consideration.

6.1.1 Conservation Elements

NatureServe Vista uses the term 'conservation element' to represent any element or class of elements for resource conservation. We are requesting your recommendations for conservation elements to be included and your justification for including them. [Project Manager: please note here which classes of conservation elements to be included.]

6.1.2 Conservation Element Categories

Categories are useful for organizing elements in lists and reports and for selecting subsets of elements for analyses. Initial element categories are provided in the spreadsheet. The first category groups the elements by class (e.g. mammals, amphibians, birds, plants, communities). [Project Manager: please note whether you desire any other element categories and guidance on types and number. Categories are commonly used to insert international, national and other imperilment ranks (e.g. IUCN Red List, ESA listing, state conservation status ranking, etc.)]

6.1.3 Data Source

[Project Manager: please revise this section to reflect whether the expert is reviewing already identified data sources or is inputting recommended data sources such as at the time they recommend an element

for inclusion.] Please indicate your recommended source of spatial distribution data for each element that you recommend for inclusion in the project. The data source column notes the spatial data that we anticipate using as the primary data source for the listed element. If you are aware of other or better spatial data, please note this on the Data Comment Form.

6.1.4 Data Confidence

[Project Manager: please revise according to whether the expert is rating the confidence of identified data or is rating the confidence of a data source they are recommending.]

Confidence Values: these values, ranging from 0.0 to 1.0, estimate the confidence that the element is where the data source mapped its distribution. When measured/observed accuracy information is included in element distribution maps, these will be applied. Since many element distributions are not based on information directly observed and/or measured in the field, and because conditions often change between mapping of element distributions and the time frame of analysis, a data confidence value typically will be assigned to all occurrences of an element from a single data source. This approach also applies to thematic accuracy assessment, e.g., remotely-sensed land cover products where a single confidence value applies to all occurrences. In cases where no measured accuracy information comes with the data source, ask expert reviewers to provide a judgment on the confidence score.

Confidence note: If you are being asked to qualitatively evaluate your confidence in the data, this field provides an opportunity to document your reasoning for the confidence value you assigned.

6.1.5 Element Viability

Unit of Assessment: The distribution of a conservation element may be represented by area or by distinct occurrences both subject to a minimum required occurrence size. Area is the more common approach whereas occurrences are used primarily for those elements that occur in small discrete patches where any level of impact on those patches would compromise viability. Experts should indicate which is the most appropriate approach to measure retention for those elements for which they have expertise.

Minimum Size for Viability: Please provide the minimum size in project units [e.g., acres or hectares] required for viability in this column.

Viability Distance Modifier: If the element occurrence can/should be characterized as a group of distinct but interacting patches, please specify the maximum separation distance between those patches to be considered part of the same occurrence.

6.1.6 Importance Weighting

[Project Manager: note that this input is not required in Vista so please delete if it is not to be included. The project may choose to establish several importance weightings, e.g., imperilment, economic value, legal status, etc. In this case please revise the instructions and spreadsheet accordingly.] The importance weight, ranging from 0.0 (low importance) to 1.0 (high importance) indicates the importance that the specific conservation element should have relative to other elements. Importance weightings are only used in Conservation Value Summaries which are an index of conservation value and are not used directly in scenario evaluations.

6.1.7 Element Response to Land Use Types

Land use types categorize how all lands will be attributed in land use scenarios for the planning area that will form the basis of impact assessment on the elements and guidance for creating mitigations and alternative scenarios. They are meant to capture current land uses as well as reasonably anticipated future land uses that may appear in alternative future scenarios. To automate the process of impact assessment you'll need to assign how each element responds to each land use type. The land use types included in the spreadsheet are based on general classes provided in NatureServe Vista and then

modified to be relevant to the project area. Land use types are divided into classes (in **bold** on the spreadsheet) and subclasses (regular text). [Project Manager: Because the names of some classes may be interpreted differently by different people, a separate spreadsheet should be provided with examples and or definitions (or reference the CMP website if classes are unchanged from the Vista default list). If your expert reviewers have any questions about a land use class definition, there should be a contact (often the project manager) listed to help them. Also, if an expert reviewer is aware of unique land use types in the region that are not included in the spreadsheet or suggests the need to separate a land use into finer classes to define important differences in element response there should be a space for them to comment on this if you are willing to allow changes at this stage]
For each element for which you have expertise, please fill in the column for each land use to indicate whether the land use is [Project Manager: insert project response categories e.g., "negative", "neutral", or "beneficial"] for that element. It is important that this value be filled in for each land use category. In the event that a value is not provided for a subclass, typically it is assigned to the value for the class under which that subclass falls. When in doubt about the compatibility of an element and a given land use, select the project default category [Project Manager: indicate what the default category should be. Using the Precautionary Principle, we suggest a negative response].

6.1.8 Element Conservation Goal

[Project Manager: if goals are not to be used or assigned at this time please remove this section, if more than one goal is to be used please revise these instructions (e.g., minimum and preferred goal) and add appropriate fields to the spreadsheet.]
Please provide the conservation (retention) goal for each element consistent with the element unit of assessment. The goal may be stated as a percentage of current distribution or an integer value such that for area units of assessment the goal can be stated as a percentage of area units (e.g., acres/hectares) or as a quantity such as 5000 acres/hectares or 30 occurrences.

7. BIBLIOGRAPHY

IUCN-CMP. 2006. Unified Classification of Direct Threats, Version 1.0. http://www.iucn.org/themes/ssc/sis/classification.htm

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APPENDIX 1. NATURESERVE VISTA CONSERVATION BIOLOGY APPROACH

Applying the Science of Conservation Biology to Land Use Planning
Conservation biology is an applied discipline, one that uses scientific principles and knowledge of ecology to preserve plant and animal species and communities in the real world. Land use planning that integrates conservation biology will develop and apply more precise information about the location and ecological requirements of biodiversity in the planning area – and can result in better land use decisions.

Central to this approach is the identification of 'conservation elements' of concern in the planning area. These could include threatened and endangered species or local environments, such as wetlands, that fall under environmental regulation. They could also include certain species, habitats, and 'open space' values of high local priority. In some cases, land use planning might be directed at conserving *all of the native biodiversity* in a given area. This more comprehensive approach could allow for better long-term conservation – helping avoid the situation in which new species and habitats would need to be regulated in the future.

This imprecise concept – *all native biodiversity* – can be effectively addressed through careful selection of the elements of biological diversity to be conserved. Selection criteria would mandate that all characteristic ecological systems be included, complimented by rare and vulnerable communities, species assemblages, and species. These criteria reflect what is known as the "coarse filter/fine filter" hypothesis, which suggests that by conserving multiple, high-quality examples of all ecological systems, we also support the majority of native biodiversity. But since this "coarse filter" on its own might not represent all biodiversity, special attention is also needed for communities and species that are rare or vulnerable – the "fine filter." Experience suggests that this is the most efficient approach to representing all native biodiversity in a network of conservation lands.
With conservation elements clearly defined, we then ask, where are they? Creating maps that accurately describe the location of these elements takes us to a next critical step, enabling us to see where many elements are found together, and where individuals occur in isolation. We can begin to address questions like: Where do our conservation elements co-occur with various land and water uses? Detailed and realistic geographic information system (GIS) layers permit more precise evaluation and planning solutions.

We then ask: What do our conservation elements need to survive and/or function properly? A particular bird species might require several hundred acres of unfragmented and mature forest to successfully raise fledglings. A certain type of wetland might require natural vegetation in most of the surrounding uplands to support natural fluctuations in water levels. A particular grassland type might require controlled fire on a frequent basis to maintain natural diversity in plant and insect species. Each of these examples describes key ecological attributes that define the quality of individual populations or habitat patches. The relative quality of these mapped locations tells us much about our options for their conservation. For example, high quality examples of rare and vulnerable species or communities are of high conservation value because few alternative

opportunities exist for their conservation. We might now ask: Are surrounding land uses in conflict with critical ecological processes? Will some locations require costly management and ecological restoration? Which ones?

We are then prepared to ask a central question of land use planning and conservation: How much is enough? Within a planning context, this question might address a *desired level of representation* for each conservation element, based on local interests and values; for example, "our county desires 10% of its lands to be in natural vegetation as open space." It could also embrace a more ecological perspective. One might apply best available knowledge to define the overall amount of each conservation element that is needed to ensure long-term survival and ecological health. This requires additional evaluation of the relative contribution of this planning area to conserving biodiversity (or other conservation values) throughout a larger region.