

# General Guidelines for the Implementation of Primary Non-Market Valuation Studies with Focus on Natural Areas in Spring Valley, NV

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## Introduction

Primary non-market valuation studies have been conducted since the 1960s to derive economic benefits to users and non-users of natural amenities. Over the years, economists have developed numerous methodologies to define and measure these benefits. Since many of these approaches are survey-based, contributions by cognitive psychologists, sociologists, and marketing experts have aided in improving and refining survey instruments and strategies. At the same time, econometricians have developed efficient technologies to process valuation-related field data. A standard reference for survey-based methods is Mitchell and Carson (1989). General sources on non-market valuation are Champ et al. (2003), and Freeman (2003). An accessible text with specific focus on the valuation of outdoor recreation is Loomis and Walsh (1997).

There are two broad types of valuation studies: Those geared towards eliciting the value of a site or resource asset to specific user groups, and those that target non-users of a resource amenity. For example, in the Spring Valley context, the bulk of economic benefits associated with hiking trails, campgrounds, 4WD routes, fishing ponds and streams, and hunting areas likely flows to active user groups. In contrast, natural areas such as the Swamp Cedar Natural Area (SCNA) and Shoshone Ponds Natural Area (SPNA) are likely valued largely for their habitat and biodiversity services. Accordingly, these values are not necessarily related to active use and thus usually flow to the general population of interest.

Aside from this user / non-user distinction, the appropriate valuation strategy is also driven by the policy context under consideration. In this respect, economists usually distinguish between "all-or-nothing" scenarios, i.e. site closures, openings, or expansions, and "change-in-quality" scenarios, i.e. situations where certain attributes of a resource area are considered for improvements or threatened by deterioration. For example, the secondary-data valuation of Spring Valley wetlands and recreation sites in Moeltner (2006) fall under the first category, since we were interested in the full value these sites generate to the public. Alternatively, the derived figures can also be interpreted as the economic loss to society if these sites were to be "eliminated", i.e. permanently altered or closed to the public. Change-in-quality scenarios are often associated with air or water quality improvements, improvements of recreational infrastructure (more trails, addition of picnic facilities, etc), or habitat improvements leading to better opportunities for fishing or hunting.

A third key criterion that determines the most suitable valuation approach is the definition of stakeholders, i.e. *whose* values we care about for a given policy context. For example, if only active users are considered, and the segment of such users is expected to be small compared to the general population, on-site sampling may be the most cost-effective way to collect data. In contrast, if a resource is considered of general importance to a wider population, and / or active use values are of secondary importance, a general survey of randomly selected households may be most appropriate. If both use- and non-use values matter, a combination of on-site sampling and general surveying may be called for.

In the following, we will present one example for each an active-use type of valuation study, and a non-use type of study. For both cases we will consider "all-or-nothing" and "change-in-quality" scenarios.

### Active use studies

Let us consider again the Cleve Creek Campground (CCCG) examined in Moeltner (2006). Assume that the BLM is interested in knowing the total annual economic benefits that accrue to different types of visitors of this facility. From a policy perspective, this is de facto an "all-or-nothing" scenario. Furthermore, as is generally the case in active-use type studies, separate benefit estimates are sought for

each free-standing activity associated with the site. The set of relevant activities needs to be defined upfront. For this example, let us assume that only "overnight use" (camping) and "day use" (picnicking, day hiking) are relevant. Suppose further that the population of interest is defined as "all visitors residing in Nevada".

Since it can be expected that only a small percentage of the general Nevada population will have visited the CCCG in the past or will visit the area in the near future, a general population survey would require a staggering sample size to yield acceptable response rates from actual users. A more cost-effective (though not necessarily "cheap") approach in this case is to intercept visitors on-site throughout the season. The more days interviewers spend at the site, the better the coverage of users will be and the more representative the sample will be with respect to the underlying population of interest. In most cases, on-site sampling involves short (15-20) minute interviews with visitors. Participants are usually asked about their primary reason (activity) for the visit, their place of residence, past visitation of the site, and – if the visit is part of a larger trip, their preceding and following destinations. The survey should also collect some basic demographic information such as group size and composition, and household income (usually captured in categories). These data are then econometrically processed to yield estimates for per-person and population-aggregated economic values for each activity associated with the site. Usually, a minimum sample size of 300 – 500 completed surveys is required to derive meaningful results.

The overall budget required for such a project largely depends on visitation frequency (i.e. how long it takes to collect 500 observations), length of season (the longer the season, the more often sampling should take place), and travel required for survey teams to reach the site. For a single site application, budgets generally range from \$60,000 - \$120,000. These figures need to be adjusted upwards if a multi-site recreation system is considered (since sampling needs to take place at several sites requiring either a larger survey team or more survey days), and / or if the policy context stipulates a "change-in-quality" scenario. In that case, survey questionnaires need to be modified to inform each respondent about the proposed changes, and to elicit WTP figures to obtain, or, if the change is undesirable, to avoid the proposed policy. This can considerably lengthen the interview process. If multiple quality changes are considered, the use of different questionnaire versions may be required to avoid excessive interview lengths. Since an acceptable minimum sample size is required for *each version*, this can substantially increase the required total number of interviews.

Recreation sites in and around Spring Valley that would likely require on-site sampling to derive active-use types of non-market benefits are, aside from CCCG, the Antelope Range Scenic 4-WD Route, the Blue Mass Scenic Area, the Sacramento Pass Recreation Area (SPRA), and the North Creek Scenic Area.

### Non-use studies

The values of natural areas that are closed to the public or for which active use plays a minor role are best elicited via a survey of the general population of stakeholders. For example, the BLM may seek the all-or-nothing value of the SCNA to Nevada residents. The design of a meaningful survey instrument requires the preparatory step of focus group sessions. These sessions should take place at different locations throughout the stakeholder region. They usually comprise a facilitator and a group of 8-12 randomly selected representatives from the target population. The primary aim of these sessions is to gain a better understanding of the level of information, attitudes, and expectations regarding the target area or policy context that prevail amongst the general population. For example, such sessions may reveal that people have little interest in visiting the SCNA, but care intensively about the survival of the Swamp Cedars. Also, it may become apparent that most residents value Spring Valley wetlands as a bundle, without distinguishing between different designated Natural Areas.

Focus groups should also provide guidance as to the best vehicle for survey implementation. For example, if it becomes clear that respondents require images and maps to make an informed valuation decision, a phone survey can ex ante be ruled out. Similarly, if focus group results make it evident that virtually everybody in the target population has easy access to a computer with a high-speed internet connection, a web survey option may be considered by the researcher.

In addition, focus groups are generally used to probe what kind of bid range may be appropriate if a referendum type survey format is envisioned (i.e. a format based on yes/no type of choice questions). For example, there is little use in asking a randomly drawn Nevada household if it would be willing to pay \$200 / year to preserve the SCNA, if 99.9% of the population would answer "no" to such a question. A well designed - and thus econometrically efficient - bid range should result in a high percentage of "yes's" for the lowest bid, and a small, but not zero, percent of "yes's" for the highest bid. The cost for focus groups generally ranges from \$3000 - \$6000 / session, depending on the logistics and travel involved in conducting a given session.

The second step in this survey process requires deciding on a survey implementation format and designing the survey instrument ("questionnaire"). As in the active use case discussed above, if subtle or complex quality changes are considered within a given policy context, multiple survey version may be required. In addition, different sets of respondents may be presented with different quality bundles and bid amounts to assure efficient econometric analysis. It is crucial that such quality scenarios are well designed and efficiently distributed across survey versions. This design process can take up a considerable amount of the analyst's time.

Popular survey implementation formats include a phone-mail-phone approach, and a multi-step mail approach. In the first case, randomly selected households are contacted and asked if they would be willing to participate in the survey. If they agree, they receive the actual survey pamphlet via mail. A second phone contact is then made to either remind households to complete the survey, and / or to add a few additional survey questions that are best administered via phone. The multi-step mail approach comprises a pre-announcement to alert households that they have been selected to participate in the survey, the actual questionnaire, a reminder card, and up to two additional rounds of replacement mailings to non-respondents. Often times, a final phone call is added to induce survey participation.

If the policy scenario is a relatively straightforward "all-or-nothing" case, and the target population is already familiar with the site or resource asset under consideration, reasonable response rates (ideally in the 60% - or higher range) may be achieved with a generic multi-step mail survey. If the policy context is more complex, and / or the target population has little knowledge about the resource asset under consideration, phone contacts may be required in addition to mailings. In either case, the expected response rate and desired final sample size (i.e. the number of completed and usable questionnaires) will determine the required number of initial contacts. For most applications, initial contacts are in the 1500 – 3000 range. Approximately 500-700 usable observations may be sufficient for an all-or-nothing scenario. Multi-version surveys may require usable samples of 100-200 per version, which can easily amount to a requirement of 1000 – 2000 completed questionnaires in total.

Depending on the nature of the policy question and the definition of the relevant stakeholder population, a general population survey may be feasible with a modest budget of under \$50,000, but may absorb funds of \$200,000 or higher for more complex scenarios and broader populations.

There are several natural areas and sights in and near Spring Valley that are likely primarily associated with non-use values and thus would likely require a general population survey to elicit their economic value. These include the wetlands discussed in Moeltner (2006) (i.e. the SCNA and SPNA),

but also sites of cultural or historic significance such as Tunnel Canyon Pictographs, Loties Canyon Pictographs, and Windy Peak Petroglyphs.

### Flexible Approaches

It should be noted that the two examples given above describe "standard" valuation scenarios and popular sampling approaches. However, we want to stress in this final note that there does not exist a "cookbook approach" that fits any valuation context. Each application is unique, and the researcher needs to custom-tailor elicitation approaches to fit the resource type, policy context, and stakeholder definition at hand. For example, it is well possible that a given active-use valuation project may call for the combination of on-site sampling and general population surveying. By the same token a non-use application with subtle quality changes may require the implementation of larger group sessions with one-on-one survey facilitation instead of a standard general population survey. The field of non-market valuation is evolving and growing rapidly, and every year new elicitation approaches and econometric analyses are proposed in the empirical literature.

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