

AN ABSTRACT OF THE THESIS OF

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Title: Forestry Extension & Low Power Radio: An Evaluation of the Santiam
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Abstract approved. Signature redacted for privacy.

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Keywords: Low Power Radio (LPR), evaluation, forestry education

Parameters: Trip purpose, sign visibility, listenership, message quality, demographics

Research Area/Region: Transmitter location atop Hoodoo Butte, at Hoodoo Ski Resort.

The Hoodoo Butte is located within the Deschutes National Forest.

Site Location: The transmitter located atop Hoodoo Butte is permanent. The broadcasts are played in a continuous cycling loop. The legal description of the area where the transmitter is located is:

NE 1/4, Sec. 17, T 12 (S), R 10 (E) Willamette Principle meridian & baseline .

The Oregon State University Forestry Extension Program, in conjunction with the Deschutes and Willamette National Forests, designed and implemented an educational program using the Low Power Radio (LPR) technology. LPR is a communication technique used to send information, via AM radio broadcasts, to an audience, typically through an automobile radio. This technique is used for dispensing such information as weather and road reports, car travel tours and interpretive information. The goal of this study was to evaluate the effectiveness of that program.

This study has a dual purpose, that is, it is both formative and summative. In these terms, this evaluation provides information about the use of the LPR program located on Santiam Pass and information that could contribute to the successful implementation and effectiveness of future LPR programs.

Through the use of survey tools, information regarding listener involvement and perceptions of the LPR program was drawn from two sources. A random sample drawn from the population of actual drivers across the broadcast area yielded 278 responses. Results of this descriptive study found that the dominant profile of the Santiam Pass driver is a 43 yr old, urban man with a high school education. The major reason for travelling over the pass is for recreational purposes (76%). The data reflected a 30% potential audience. That is, only 30% of the respondents were aware of the program's existence. Of the total number of respondents 8% tuned into the broadcast.

The second source, comprised of fifty individuals, was a purposeful sample of people interested in public natural resource education. Assessment of the data retrieved here showed that the demographics roughly matched the random sample in all characteristics but educational level. The dominant profile of the internal group is a 46 yr old, urban man with a college education. The major reason for travelling across the pass was for recreational purposes (56%). The majority of the respondents felt that they had learned something from the messages (84%) and that the program was useful (88%). Seventy-eight percent said they had enjoyed the program and fifty-six percent said that they would tune in again.

The demographics of the population audiences were noted and compared against other variables in an attempt to create a portrait of significant characteristics relating to use and enjoyment of the LPR program. The data were statistically analyzed to examine the hypotheses relating to : 1) Community influencing tuning in to the broadcasts, 2) Sex influencing tuning in to the broadcasts, 3) Age influencing tuning in to the broadcasts, and 4) Educational background influencing tuning in to the broadcasts. Statistical tests used to examine these hypotheses in null form did not allow for rejection in the random sample. Information regarding demographics and frequencies in that sample have proven useful to the summative scope of this evaluation. The purposeful sampling group did suggest significant relationships for questions 1 & 2 from above. Those are that urbanites considered the program useful more often than rural dwellers and that men felt that they had learned something more consistently than did women.

Forestry Extension & Low Power Radio:
An Evaluation of the Santiam Broadcast Site

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This thesis is dedicated to the late Dr. Anthony J. Lamb.

Through his unwavering belief in me, he has given me a gift that transcends time.

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Forestry Extension & Low Power Radio:
An Evaluation of the Santiam Pass Broadcast Site.

I. Introduction

The importance of forests in the United States has never been more emphasized than it is today. Forests in this country occupy about 731 million acres. Nearly every state can boast to having forest land (Ellefson, 1992). The diversity and richness of forest ecosystems create unparalleled natural resources. These resources come in many forms. The social and economic resources of forests relate to the obvious wood products, minerals and wildlife components, but also to the less obvious components of recreation, watersheds and aesthetics (Wilkinson, 1992). Historically, the professionals in American forestry have tended to specialize in the hard sciences that deal with the development, maintenance and management of forests. The plethora of real goods and added benefits derived from forest lands work to create an intricate web of management goals. This divergence of management goals can lead to conflicts. The current forest management trend seems to suggest that forestry professionals of tomorrow will need added emphasis in the sciences of human nature and politics.

The Federal Public Land System contains approximately 632 million acres. The National Forest System alone oversees 191 million acres of forest land. The great majority of that forest land, 141 million acres, is located within the eleven western-most states. Oregon is second only to Idaho in the percentage of national forest land to land area in the state (Wilkinson, 1992). One quarter of all land within Oregon is under the jurisdiction of the United States Forest Service. This creates some unique issues in that many areas of forest research and management are located on those public lands.

Recent events such as the on-going spotted-owl debate and President Clinton's Western forest conference have helped to pique the country's interest in the fates of our national forests. Management policies and their ramifications have undergone intense scrutiny. The general public, although largely unschooled in the disciplines of forest

management, is growing as a major influence in many of the political actions which can significantly affect current and future forest management practices. It could be argued that it benefits all Americans to have informed policy development, both public and professional, with regards to our natural resources.

Public education about forestry issues is one method of creating that "informed public." One of the ways in which Oregon State University (OSU) has sought to address these issues is through the work of its Forestry Extension Program. Among its many services, the OSU Extension Program uses innovative educational tools and techniques to educate and inform the general public on forestry issues. This paper will describe and evaluate one of the current OSU Extension educational projects.

Low Power Radio Program Origin

Distance education using radio has been used for a number of years. As early as the 1920's, radio played an important role as a public communication tool. This type of information sharing has been used within the natural resource fields to provide public service announcements, news, hosted shows, and feature programming (Fazio & Gilbert, 1981). Some advantages of using radio are its easy access, immediate availability, and the possibility of rapidly evolving program content. Although radio may be a powerful educational tool, it can present some problems due to its passive nature (Verduin & Clark, 1991). Overall, the relatively low implementation costs and the potentially large audiences make the use of radio as an educational tool effective (DeYoung, 1992).

Through a joint effort, OSU Forestry Extension and the U.S. Forest Service have designed and implemented a forestry educational program which uses low power radio (LPR) broadcasts to educate the general public about some key forest issues. This project, the Santiam Pass LPR Project, is a proto-type station for a network of planned LPR stations.

LPR technology emerged in the 1970's and has been growing ever since. It involves the use of a specialized AM radio frequency to broadcast messages to a limited range (DeYoung, 1992). Generally, LPR is designed to reach audiences within automobiles. A 1979 survey showed that 90% of the automobiles in the United States had radios in them (Fazio et al., 1981). The many transmitters of LPR broadcasts are quite varied, including drive-in movie theaters, highway departments, broadcasting weather and road conditions, activity listings, historic attractions, and rules & regulations (DeYoung, 1992).

The Santiam Pass LPR project has its design basis in the educational theory of the "teachable moment". That is the philosophy that more effective information transfer can occur if information is given to an individual at an appropriate moment from the learners' perspective. In this instance, the concept was to educate the motoring public about Oregon forests, focusing on current issues and service information such as permit procedures and volunteer groups, while those individuals are actually viewing the forests. In that way, the project hoped to capture a "teachable moment" in action.

Low Power Radio Program Goals

The trend towards urbanization has not neglected Oregon. Many of Oregon's metropolitan areas are experiencing population growth. This "urbanization" of Oregon's people has contributed to circumstances whereby the general public is growing increasingly detached from the dimensions of their natural resources and related issues which currently face this state (Atkinson & Fletcher, 1992). Some people may only hear one side of many controversial situations. Yet the potential to influence management policies and practices through the political process still resides within each of us. Citizens travelling through the forests and having the opportunity to gain new data may lead to more informed and knowledgeable citizens who better understand the conditions of today's forests, forest health, and management practices.

The main objective of the LPR project was to reach people in their cars at the time they are viewing the forests of Oregon and give them unbiased, research-based, educational information about forest issues. The potential for increasing the general public's knowledge about certain forest topics is present if well-designed messages combined with effective roadside advertisements are used (Atkinson et al., 1992).

The Santiam Pass AM radio transmitter was located such that it would send a broadcast that could reach drivers as they moved through sections of the Willamette and Deschutes National Forests. These transmissions are intended to reach those people driving over the Santiam Pass, at the merge of routes 20 and 126. This area was chosen due to its locale as a central travel corridor which traverses between urbanized areas, such as Eugene and Corvallis, to Central Oregon's outdoor recreational areas, as well as its route through two national forests. These areas of forest have suffered from pest problems resulting in highly visible tree mortality and could cause many to wonder about the causes of the dead and dying trees. The intent was to reach the public at the precise time those conditions were visible, and when they posed those types of questions.

Because it was assumed that there would be diversity among the Santiam Pass travellers, this educational program was designed for a broad range of ages, educational levels, and ability levels. The program is run on a self-selection basis; those individuals who choose to tune into the broadcast may do so. The period of program involvement for the learner could range from approximately three to eight minutes. Travellers are alerted to the existence of the LPR program by way of signs placed along side the highway. These signs give directions to tune in to a specific AM radio frequency for information about the forests. Naturally, the program would be limited to groups and individuals who have access to an AM radio at the time of the crossing. This program would reach aggregates of people in their cars, which would likely include family groups, friends, and business acquaintances.

The LPR program involved the efforts of approximately ten OSU extension agents, four U.S. Forest Service employees, and several others involved in the writing and production of the messages. The mechanical installation of the radio transmitter was left to the U.S. Forest Service, who purchased and agreed to maintain the Santiam Pass LPR station.

II. Literature Review

This literature review is divided into three main sections. The first looks into the history and applications of extension agencies in the conduct of informal education in the United States. The second section reviews the basics of extension program planning and implementation. The third and final section addresses program evaluation and is further divided into four subsections including evaluation basics, evaluation methodologies, sampling, and data analysis.

Extension Education: Roots and Applications

The Smith-Lever Act of 1914 established a federal mandate for the use of cooperative extension in land-grant universities. This act was a broadening of the 1890 Act of Congress which allowed for agricultural extension work in land-grant colleges. This legislation fashioned a cooperative partnership between the U.S. Department of Agriculture and the land grant universities in order to better facilitate the diffusion of *"...useful and practical information on subjects relating to agriculture, home economics, and rural energy, and to encourage application of same..."* (Sec. 1) to the general public in need of such information. This act went so far as to define agricultural extension work as the *"...development of practical applications of research knowledge..."* and of demonstrating and instructing on technologies, new or existing, which would improve the current practices or technologies (Sec. 2).

Modern extension services cater to a great many people with varying needs. Extension serves to help the community (and individuals) identify and assess needs and resources, discuss methods and alternatives for overcoming problems, and design and implement programs which will help solve and prevent the recurrence of problems (OSU pub. #3, 1989). The service has specialized its faculty to accommodate these varying

demands. Program management extension service includes administration, specialists and county extension faculty or agents. The administration is responsible for program and personnel management as well as budgetary and evaluation accountability. While states vary in approach, specialists primarily work as liaisons (and educators) between actual research and the county agents, as well as acting as subject matter consultants (OSU pub. #2, 1991). The county extension faculty members integrate information to practical use by educating and interacting with the members of the community. These parts working together create an institution capable of delivering necessary and pertinent technical and research information to community members (OSU pub. #1, 1989).

Oregon State University Extension Service has taken the legislation one step further. OSU Extension is dedicated to helping Oregonians manage resources prudently by furnishing research-based, objective information. OSU Extension is recognized as a primary source of informal education for the communities in Oregon. The Extension Service has outlined educational goals of promoting economic development, human development, natural resource conservation and management, and leadership development. The members of the OSU Extension Service seek to respond to and reflect local as well as state needs by initiating citizen advisory councils, county planning processes and state policy education programs (OSU pub. #5, 1991).

Program Planning

Program planning is an integral part of any educational enterprise. Cooperative Extension places great importance on effective program management. Historically, there have been two dominant program planning models used in Extension education, research-transfer models and adult education models. Both of these models offered adequate transference of information on some levels but lacked the kinetic adaptation, that is a continual evolution to suit the audiences, needed to satisfy all parties involved. Current trends look toward a new interdependence model.

Interdependence models describe two things; (1) roles, operations, and products of the Extension teams and related agencies, and (2) the continuous mutual dependence needed to resolve public issues and client needs (Bennett, 1992). This model includes contributions made by the private sector, accounts for role sharing by various entities, places great importance on networking, and delineates the differences between information transfer and education. The diagram on the following page (Figure 1.1) attempts to outline the model.

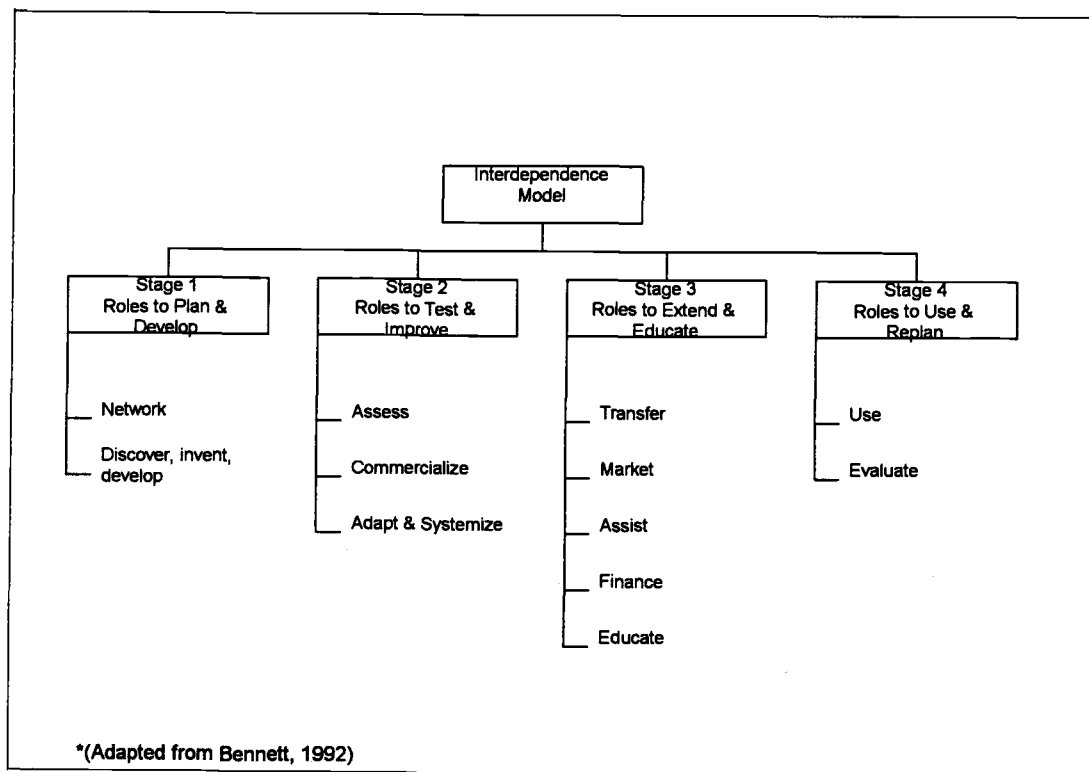


Figure 1.1 Bennett's Interdependence Model

The interdependence model is broken into four stages, each of which has subsections. Stage one involves roles to plan and develop. This stage stresses the importance of *networks* to appraise, acquire resources, and implement programs.

Discover, Invent and Develop follow and these deal with discovering a basic principle of the situation, inventing plans or technologies and developing those into practices.

Stage two discusses roles to test and improve. These would be to *assess* technologies and practices, *commercialize*, and *adapt & systemize* practices/technologies to meet the needs of the various individuals.

Stage three moves to the roles to extend and educate. In this stage the *transfer* (which indicates free information) or *market* (which can be done for profit) of the practices and technologies occurs. In this stage *assistance* with application and *finances* also is discussed. The last sub-stage is *education* by helping individuals to generate problem-solving abilities. Stage four, the final stage, details roles to use and replan. This final stage looks at actual end-user *usage* of practices and technologies and the *evaluation* of program impact. Current thought claims that use of this model will account for the special relationship which exists between Extension, research and the community (Bennett, 1992).

The OSU Extension Program Planning Model works toward an integration of the inter-dependency of agents, specialists, administration and community needs in developing plans. This model uses six concentration areas with each having several feedback loops to other areas. The six areas; trend analysis, issues identification, priority setting, program design, implementation, and evaluation and accountability, circle around a core of communication networks and resource allocation. These areas, with dynamic feedback loops and open communication networks, produce an evolving interactive model for program planning (OSU pub. #4, 1991).

Planning programs after tensions have polarized issues requires a slightly different tactic. Heimlich and Winkle (1993) have proposed an intervention process strategy which borrows from group process and Gestalt therapeutic processes. This strategy was used with a community and a proposed landfill project. Pre and post-testing combined with non-threatening discussion of ideas, and successful redirection of negative comments created a forum by which attitudes changed. This type of plan may forestall problems when Extension agents are placed into a situation which is emotionally charged.

Refocusing aggression and validating members' opinions help in easing tensions and shifting attitudes (Heimlich et al., 1993).

A key element of accountability for public funds addresses the evaluation of program outcomes, including diagnosis of program failures. Ineffective results can occur due to inappropriate content, inadequate implementation, or lower than anticipated outcomes and their analysis may be used to make adjustments in programs (Decker, 1990). Impacts are not the exclusive determinants of program failure or success. Four questions that should be asked when assessing unsuccessful programs are:

- 1) Was the program model at fault?
- 2) Was implementation at fault?
- 3) Were expectations realistic?
- 4) Was evaluation (of success/failure) appropriate?

Each of these areas can be partly or wholly responsible for program failure and each should be assessed first individually and then as part of the whole before attributing the failure to any one. Inadequate program implementation is often the cause of unsuccessful programs. It is best to evaluate during implementation so that adjustments and adaptations can be easily accomplished. Using these measures in a concerted effort to assess the evaluation of programs should provide solid and worthwhile program evaluations (Decker, 1990).

Program Evaluation

Evaluation Basis

In order to discuss the finer points of evaluation for this paper, an overall definition will be helpful. Webster's (1991) defines evaluation as, "1. An act or instance of evaluating or appraising," and evaluate as, "2. To determine the significance or quality of;

assess." In short, evaluation has to do with the use of information (or *evidence*) to ascertain the value or worth of a program (in essence to pass *judgement*) (Sawyer, 1990).

There are several reasons for doing evaluations of programs. Some of the basic justifications would be; improved decision-making, increased understanding, motivation, developing effective programs, and accountability (Bryk & Light, 1981). Understanding of these factors is an important component in the successful implementation of useful programs.

Among the ways to describe program evaluation are identifications such as internal and external. Internal (program management) works to create a self-checking evaluation system. This system works from the inside to the outside. External is a movement towards accountability from outside the program. Both of these methods should be used together to create the most effective programs possible (Sawyer, 1990).

What should be evaluated? This is a key question which can sometimes be overlooked. The Joint Committee of Standards for Educational Evaluation (1981) points to four questions which should be answered before beginning an evaluation. Those are questions of:

- a.) Evaluation usefulness?
- b.) Evaluation practicality?
- c.) Fairness & ethical implications of an evaluation?

and finally;

- d.) Accuracy of an evaluation?

If the answers to all of these questions are constructive then the evaluation project is a workable one. Once these basic guidelines are covered the real task of setting up an evaluation occurs. Specialists have delineated a checklist of steps to go through (Joint Committee, 1981):

- i) Select which program to evaluate
- ii) Decide why to evaluate and the purpose behind it
- iii) Identify evaluation audience

- iv) Determine level of evidence needed
- v) Decide criteria & how evidence will be managed
- vi) Determine resources needed
- vii) Develop measurement tools
- viii) Conduct measurement
- ix) Analyze data
- x) Report

These steps are similar to any in a scientific report but according to L. Forest (1977)

"Measurement for purposes of evaluation is not a science, it's an art and rests on the beliefs and abilities of individuals." Evaluation of programs also presents some specialized criteria. Number four on the checklist, levels of evidence needed, gives a range of viable options dependent on the desired strength of the final assessment. This is generally shown as various levels of a hierarchical scheme as on the following page, Figure 1.2 (Bennett, 1977). The higher up on the scale correlates with a higher evidence of impact and a strengthened assessment of the program.

It is helpful to identify the levels of evidence desired to be attained for the evaluation prior to evaluation planning. *Inputs* relate to the amount of resources, time, and costs that go into creating the program. *Activities* are those actions which deliver the program and publicize it. *People Involvement* consists of the number of people involved with the program, as well as the individual characteristics, the frequency and intensity of interactions. *Reactions* are concerned with the degree of interest generated and the like or dislike of the activities. *KASA Change* is an acronym for changes in: Knowledge, Attitudes, Skills, and Aspirations. These relate to the effected changes in the program participants. *Practice Change* views the changes in adoption and application of KASA changes as a result of the program. *End Results* define the social, economic, environmental, and individual consequences of the program.

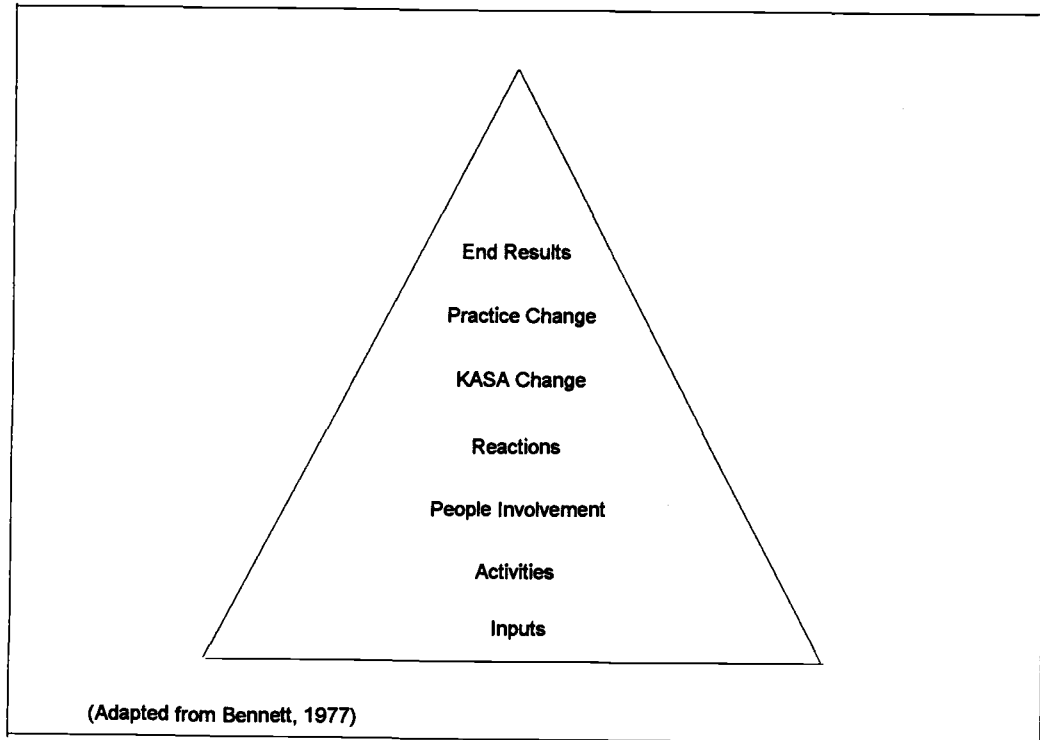


Figure 1.2 Levels of Evidence

Educational programs hope to result in some, or all, of these types of evidence. These levels of evidence are used as a criteria for ascertaining the productiveness or effectiveness of the program. Costs of attaining the evidence of program impact rise along with the levels, although evaluations are strengthened by assessing several levels of the hierarchy (Bennett, 1977). Ideally, an evaluation would seek to ascertain evidence to demonstrate the end results of an educational program. This study, due to limitations and constraints, has been limited to attaining information and assessing up to the reaction level.

In every discipline there arise some tenets which seem to apply in most circumstances. In an evaluation study, it is helpful to remember these next four sentences. Measurement does not equate with evaluate. Personal biases are a constant in any

evaluation. Program size will affect evaluation methods. And finally, any good evaluation will hinge on how the evaluator deals with these rules (Forest, 1980).

Preparatory work in beginning an evaluation of an extension program can be confusing. To assist in the early stages Forest (1977) has put forth nine questions any evaluator should consider before beginning an evaluation.

a.) *Do you need data at all?* An interesting question which might easily be overlooked. Forest suggests that no empirical studies have been conducted which prove that data are a necessity. In any case, it is supremely important that an evaluator knows what he or she wants to do, or decide, with the data well before data collection. These basics will expedite any subsequent statistical manipulation and reduce the burden of data collection by omitting unnecessary information.

b.) *What is measurement?* Understanding that measurements are generally a simplistic abstraction of the total situation can aid in the direction of the evaluation. Measurements can numerically standardize information. This allows the data to be used to verify, predict & explain the situation through numbers (Forest, 1977). The use of measurements can be a tremendous service in the consequent analysis of information. The next question should be which scale to use. Scale correlates directly with the type of data gathered. There are four main scales of measurement; nominal, which relates to counted data, ordinal, which relates to ranked data, and ratio/interval, which both deal with measurement data (Courtney, 1991d).

c.) *Are you concerned about proving Extension's contribution?* The question of a cause/effect relationship is difficult to prove in many educational designs. Due to the informal composition of many extension educational programs that relationship becomes even more obscure. There are still avenues of recourse. The evaluation can use different measures. Forest (1977) outlines the following three;

Table 2.1 Evaluation Designs

Design type	Result
1) Quasi-Experimental	Approximates designs & controls
2) Regression & multiple correlation statistics	Identifies program effectiveness variables
3) Documentation & observation	Documents associations

These types of designs can overcome some of the difficulties in assigning cause/effect relationships by using other measures such as effectiveness and associative variables.

d.) *Can you organize your measurements to make them more descriptive and meaningful to the users?* This step allows for a smoother evaluation and analysis. In any report, clear understanding by all parties involved provides more reliable information.

e.) *What data do you need?* The question again recounts the importance of appropriate data collection. One rule to remember in an evaluation is to adapt measurements to the program. This requires considering all feasible possibilities, as well as using combinations of measures.

f.) *How much data do you need?* Once the needed data are defined, in relation to ideas and subject matter, it becomes necessary to determine quantities. This question alludes to sampling strategies. If possible, it is best to use randomly chosen representative data. Be aware of constraints such as time or duration of the evaluation data collection, as well as people who participate in any respect.

g.) *What measurements are you going to use to collect data?* Methods of data collection are varied. Be aware of any existing data which may be helpful, but also consider various other methods. These may include such things as: observation, rating scales, check lists and logs, or surveys (personal, phone & mail). Ad hoc evaluation (review panel) committees can also be a valuable source of information.

h.) *Have the risks of getting and interpreting reliable and valid data been*

considered? In the final analysis, data need to be consistent, representative & unbiased to be considered for valid statistical testing. Problems can occur even with this type of data. Results can be misconstrued in a variety of ways. "Pointless precision" can occur when consideration for reliability and precision in the evaluation design goes far beyond that which is needed to answer the question. In many cases results may seem to show no progress. In a "worst case" scenario, evaluation results could even be threatening or misinterpreted. And as with any research project, the data collected may not be construed as credible or relevant to the project.

i.) *Have you considered setting standards? What is enough?* What is the criteria of a successful or unsuccessful extension program? The final analysis may bring little information in answer to that question. Forest creates a neat checklist of evaluation questions. These same types of queries are echoed throughout the literature on evaluation. The underlying message seems to indicate that forethought and planning can certainly reduce the risks of ineffective, invalid or unused evaluation studies.

Methodologies

The process of evaluation begins with some key concepts and questions. The purpose of considering these concepts is to derive a greater understanding of the reasons behind evaluation and the various types of evaluation methods. According to Forest (1981), one of the premier questions is "Are program reviews a social political process or a scientific one?"

The criterion for determining which category a program review, or evaluation, falls into are related to underlying reasons for the review and some strict scientific definitions. The political aspects search for a situational good while the scientific approach searches for generalizable truths. For a review to be considered scientific it must fulfill the criterion for (1) the search for truth, (2) generalizability, (3) use of controlled situations, (4) objectivity, (5) reliability, and (6) validity (Forest, 1981). In most cases all of these

standards cannot be attained so most comprehensive program evaluations are political in nature, this study notwithstanding. Political considerations range from policies backed by legislation to the motives of the participants. When assessing the political nature of an evaluation there is a two-part representative set; the setting & the process. This two-part set can be outlined as follows:

I. The Setting

- A. The System- Patterned relationships in which influence is exercised.
- B. The Size- Evaluations become more political as program size grows.
- C. Conflict, Pressures, & Competing Values- Resolution of conflict.

II. The Process

- A. Articulation of Interests- The basic making of a demand.
- B. Power Play- Use of evaluation information to adjust program.
- C. Decision-Making- Political process leads to consensus.

Understanding the motives and character of evaluations leads to a more complete understanding, and therefore, a more effective evaluation. There are two basic approaches to evaluation, according to Huffman (1978), *ex post* and *ex ante*. *Ex post* uses statistical tests for meaningful relationships between resources and results. *Ex ante* predicts future advances in technology and predicts expected results. Extension programs place a large emphasis on intermediate ends and takes a more sociological approach to *ex post*. There are limits placed on the value of the extension approach as it detracts emphasis from the returns to the investments. Huffman (1978) also argues that there are some important areas which should be considered when trying to address the effectiveness of extension agency programs. These areas include:

- ◆ Determining the types of interaction between educational levels & the extent to which they complement or substitute for one another.
- ◆ Determining the extent of differential effects of extension.
- ◆ Determining the effects of extension on outputs.
- ◆ Determining the extent to which private agencies can substitute for public.

Evaluation data come in two broad categories, quantitative and qualitative. Typically, the hard sciences make use of old scientific paradigms which work from acquired models and look for normative world views. Use of this methodology assumes quantitative data which are generally appraised by experimental design, multivariate, parametric, and statistical analysis. Social and behavioral sciences are dominated by this hypothetico-deductive paradigm. This method is not necessarily suited to qualitative data. The alternative methodology, holistic-inductive, aims at an understanding of social phenomena and relies on qualitative data, holistic analysis and detailed descriptions (Patton, 1982b).

To decide which methodology suits which evaluation, it becomes necessary to understand the nature of qualitative data. This type of data is open-ended and consists of descriptions, observations, direct quotations, and case documentation. Once established, this alternative method uses naturalistic inquiry (investigation of phenomena within and in relation to their naturally occurring context), inductive approach, and a holistic view to create a dynamic model of evaluation. The ideal method for evaluating qualitative data is a holistic-inductive research through naturalistic inquiry (Patton, 1990) .

Evaluation through observation is one of the techniques used to gather qualitative data. Although inherent biases can cast doubt on the validity of observational data, trained observers can overcome much of this problem. In the collection of observational data there are some variables which should be considered like; overt v. covert observing, duration of observation, sensitizing concepts, program setting, program activities, informal interactions, non-verbal communication, and unobtrusive measures like the participants reactions to the evaluator. All these factors plus creativity and the style of actual field work will work together to create a valid evaluation of qualitative data (Patton, 1990) . These observational techniques shall be integrated into the data collection process and the data analysis processes which will be employed in this evaluation study. There are many other types of evaluation methodology. Some of the major approaches to evaluation are outlined in the following table.

Table 2.2 Evaluation Methods

Model	Major Audience	Assumes Known	Methodology	Outcome
Systems Analysis	Economists, managers	Goals, cause/effect, Quantified variables	Linear programming, cost-benefit analysis	Efficiency
Behavioral	Managers, Psychologists	Specified objectives, Quantified variables	Behavioral objectives, Achievement tests	Productivity, Accountability
Decision-making	Administrators	General goals, Criteria	Surveys, questionnaires, interviews	Effectiveness, Quality control
Goal-Free	Consumers	Consequences, criteria	Bias control, logical analysis	Consumer choice, social utility
Professional Review	Professionals	Criteria, panels, procedures	Review by panel	Professional acceptance
Case Study	Client, Practitioners	Negotiations, activities	Case studies, interviews, observations	Understanding diversity

(adapted from House, 1980, p.23)

There are no precise rules and regulations concerning procedures of observation and collection of qualitative data. The situation will dictate the form and style of the collection processes. Conduct while gathering observational data does have some mandates though. These include precise descriptions and records, gathering a variety of information from different perspectives, cross-validating patterns, and clearly separating description from interpretation. The study should bring together a holistic and sufficiently detailed picture of what has been observed (Patton, 1990).

Sampling

An important aspect of most research projects is sampling. Samples represent a part of the entire population. The use of a subset of a research group to gain information of the whole attempts to balance the value of increased information with the costs of gathering data. A well-defined sample will closely resemble the entire population and extrapolation can occur from the gathered information (Courtney, 1991d).

Initially, the population of interest must be defined. This will give the units of analysis for the research. These units, in turn, define a type of data collection, analysis focus, and levels of information. "The key issue in selecting and making decisions about the appropriate unit of analysis is to decide what it is you want to be able to say something about at the end of the study" (Smith, 1980).

Once the population is defined and units of analysis identified the next step is choosing a sampling design. There are two categories to choose from, probabilistic (random) and purposeful. Random samples are where each member of the population has an equal chance of being in the sample group. This is usually used when studying a large initial population group. There are two main types of random sampling, simple and complex. Simple requires that each member of the population be identifiable and then randomly chosen. When this is unfeasible, complex strategies must be used. Purposeful sampling uses selected subgroups and identifies information about those groups.

According to Smith (1980), there are six different types of purposeful sampling:

- 1) Extreme or Deviant Units - This studies the best and worst case groups.
- 2) Typical Units - This method attempts to analyze a few "typical" groups.
- 3) Variant Units - This method chooses cases for their variability.
- 4) Critical Units - These cases are those that exemplify a important variable.
- 5) Politically Sensitive Units - Most use out of the least resources.
- 6) Convenience Units - Studying the most convenient units.

Sample size is also a problem to be reconciled. Considerations to take into account when determining sample size are things such as the size of the total population and the amount of known error the researcher is willing to tolerate. These will affect the confidence levels used during the statistical testing of the data. Also consider the number of expected responses. Sudman (1976) gives a guideline of estimating a 75-80% response rate. Also be certain to factor in the expected rate of deadwood, that is, those contacted who are no longer members of the original population. Lastly, it is important to factor in the amount of available resources. Again here estimates can be effective. When allotting time and resources, estimate .33 for data-gathering, .33 for analysis, and .33 for report writing.

An accepted guide is to have a sample size large enough that there are 100 or more units in each major category and 20-50 in the minor ones (Sudman, 1976). These figures can be modified dependent on what types of confidence levels are required. There are also various sample tables which can facilitate determination of sample size. One method of simple random sampling is *systematic sampling*, which requires a sampling interval and a random start. There are three types of complex random sampling; *area sampling* requires random sample from geographic areas, *stratified sampling* requires stratification of initial population and sampling between those stratifications, and *multiple matrix sampling*, which entails asking sub-samples of the population sub-samples of the questions.

Defining a sampling frame, that is, a list of the population elements, can be a serious problem. Hoinville & Jowell (1978) have made an inventory of five minimum criteria which need to be fulfilled for a satisfactory list. Those are;

- i) Is it composed of the same kind of population elements as the survey population?
- ii) Is it complete? If not, what is the estimate of the number and types of missing elements?
- iii) Are any elements listed more than once?
- iv) Do all elements belong?
- v) Is the information current?

Other unavoidable ingredients in any research study are error and bias. There are three main sources of error; sampling variability, sample bias, and response effects. These effects are sometimes extremely difficult to pin-point. These biases stem from a number of variables relating to the respondent. Response effects generally have the largest amount of influence (Sudman, 1976).

Data Analysis

Defining appropriate types of data is helpful. These should emphasize feasibility, usefulness, and believability. Major considerations are validity, that is, the degree to which an instrument appears to measure what it is supposed to measure, and reliability, the ability to measure consistently (Courtney, 1991a).

The evaluation data analysis should focus on the types of questions asked and the types of data obtained. Tally and group data by relevant sections. Percentages and frequencies are an appropriate and sufficient measure for many evaluations. Statistical significance determines the probability of a chance happening. Valuable tests to use in these analyses include chi-squared, t-tests, paired t-tests, t-tests for unmatched means, and analysis of variance. Tests differ relating to the level of measurement intended. These can be applied to either *categorical data*, grouping variables, or *continuous data*, which includes ordinal and interval data (Pratt, 1991).

III. The LPR Evaluation Approach

Evaluation Purpose

There are multiple reasons behind the evaluation of this low power radio educational program. The primary reason that this study has been established is to begin to build a body of knowledge on the evaluation of low power radio as an educational tool. This study will also attempt to present information which can be utilized in the refinement and/or operation of other LPR sites within Oregon State University's Forestry Extension network.

This evaluation was conducted under the request of the OSU Extension LPR Team. As one of the last phases of a typical extension educational project, there was a need to conduct a follow-up evaluation study. Certain factors of this project made a prompt evaluation very valuable. Those factors related to the novel educational approach in use, as well as the difficulties in attaining feedback from participants. This evaluation is intended for use by stakeholders including program staff, federal forest agencies, Oregon Forestry Resource Institute, and academic researchers. The scope of this evaluation has both aspects of being summative, in that it examines a complete operational LPR site, and formative because the results and information gathered here will be used to refine other LPR sites.

This paper will work towards evaluating the educational aspects of using LPR broadcasts for distance learning in a non-traditional educational setting. This phase of the project will be concerned with addressing the following goals under the overall theme of program effectiveness.

Goals of the Santiam LPR Evaluation-

- A) Understanding learner usage
 - 1) Comprehension of messages
 - 2) Enjoyment
 - 3) Likelihood of repeat usage

B) Addressing sponsor wants/needs

- 1) Public involvement - An evaluation of how much of the general public is involved with the use of the LPR transmissions.
- 2) Conveyance of message - An evaluation of the educational success of individual messages.

Through a series of qualitative and quantitative questions, information collected during this study will be analyzed in order to address several different specific objectives.

These are:

- A) To assess effectiveness of roadside signage.
- B) To determine active listenership of the LPR program.
- C) To compare some demographic characteristics of listeners and non-listeners.
- D) To determine increased listener knowledge of broadcast material.
- E) To determine listener enjoyment.
- F) To determine listener value of the program.

Scientific inquiry demands that certain types of research questions, or hypotheses, should be stated (Courtney, 1991b). This evaluation, although qualitative in scope, will attempt to address some specific research questions. These hypotheses are stated below in the null hypothesis form and will be specifically addressed in the statistical analysis of the data gathered.

Hypothesis₁ -There is no significant correlation between the community type of the respondents and whether or not they tune in to the program.

Hypothesis₂ -There is no significant correlation between individuals tuning in and their age.

Hypothesis₃ -There is no significant correlation between individuals who see the advertisement sign and their age

Hypothesis₄ -There is no significant correlation between educational levels and tuning in to the broadcast.

Further analysis of the data in an inquisitive context will seek to find correlations between any other aspects. These research questions will be asked to ascertain if there are any significant characteristics of listeners or non-listeners and use that information to detail new programs to specific audiences.

This evaluation was conducted under various restrictions which acted to reduce its possible scale and impact. Some of these restrictions were research oriented, such as the lack of much background research on LPR informational program evaluations, others involved limitations of time and money. These limitations specifically involved seasonal time limitations and monetary restrictions on the types of research feasible to use in this study.

Evaluation Design

This program came inherent with certain challenges including a non-traditional teaching style, a leisure setting, and a mobile target population. Evaluating this program first required some way of contacting recipients. That is, it was necessary to determine some way of reaching those individuals who were driving across the Santiam Pass.

Sampling a population in-transit gives rise to many problems. Some of the specific challenges entailed in this study are listed below.

- ◆ The most obvious of these challenges is the logistical problem of attaining a random sample of people travelling in vehicles at speeds of up to sixty miles an hour.
- ◆ After attaining a random sample, what information can be effectively drawn from those respondents is also an issue.
- ◆ This study had the additional problem of time lapse between LPR program implementation and individual contact.

This study addressed these issues by designing this study in two phases. The two phases, labeled external and internal, will focus on different aspects of the evaluation. The external phase will look into LPR as an educational tool, and the internal phase will examine recreational and educational content of the broadcasts.

Methodology

This evaluation uses surveys as the primary methodology. Some individual opinions and feedback are also included. Survey design was chosen due to the qualitative and personal experience type of information needed to assess this educational program. This design allows an evaluation to attain structured information but still permits individual feedback.

This methodology does contain some limitations of design. That is, there are biases inherent in the construction of the survey itself, as well as in implementation methods and respondents. These factors may also act to limit the responses from individuals. An attempt was made to curb biases by constructing a short survey of priority issues with questions as neutral as possible. These questions dealt primarily with objective points such as asking the respondent forced-response, and mutually exclusive questions. These types of questions ask for specific information about the core questions (Orlich, 1978).

Beyond biases, this evaluation methodology also had some unavoidable confounds. These related to time differences between program implementation and survey implementation. This unavoidable pause put certain constraints on the amount of contextual information individuals could be expected to have remembered. In an attempt to minimize this recall bias, phone interviews were done as soon as possible after the individual drove over the pass and the phone survey questions were limited. In order to gain more information on the program, a second part of this evaluation used focus-groups in lieu of the actual population members.

Survey Design

Initial survey design called for tools to be divided into three types corresponding to the implementation techniques used. These surveys were designed for self-implementation, interview over the telephone, and personal interview. These surveys and implementation procedures evolved through processes of respondent feedback, peer review, and survey success. Although surveys remained the primary method data gathering, the types and sites evolved through a trial and error process. An attempt was made to implement the first three-survey design process but the results were unsatisfactory. Low response rates and lack of participation necessitated revamping the design process.

The final project simplified the design. It consisted of two surveys, one for telephone interviews and the other for personal interview. This splitting of the evaluation into two different forms is due to implementation techniques. The telephone survey is designed to assess objectives (A), (B), and (C). Specifically, whether or not the general public is tuning into the broadcast. This design includes the basic questions to determine if people saw the advertisement signs and if they tuned in. The survey includes a brief section on the demographics of the motorist.

The second survey was designed for a group setting using purposeful sampling of typical units (listeners). This survey assesses objectives (C), (D), (E) and (F). Specifically, it screens the respondents, determines if they tuned in to the broadcasts, if they feel that they have learned anything from the broadcasts, and ends with a short demographics section. This sample represents purposeful sampling of typical units. The design scheme of the evaluation is such that results will allow demographic interpretation of those who did and did not tune in. The group surveys will continue with those who have listened to the broadcasts to evaluate program quality. This overall project design will allow interpretive discussion of both the mechanical means of using LPR to transmit

educational broadcasts, and the educational content of the messages themselves. These survey tools are labeled in Appendices B & C .

This project analyzed both quantitative and qualitative data. Much of the data was coded and analyzed through the use of statistical measures. Focus group survey results collected during the second phase of the evaluation were descriptive and simply reported.

These survey instruments themselves were developed through a series of professional reviews. This method of instrument validation employed was an informal DELPHI technique. This technique attempts to create valid survey tools through the assessment of the tool by professionals in the field. The survey faces review by the panel, including iterative feedback to the panel on their reactions, until consensus on the survey content is reached (Courtney, 1991a). The surveys were under scrutiny by members of all agencies that were involved in the LPR program. This technique has the advantages of clarifying issues, incorporating organizational desires, and identifying the priorities of a study (Orlich, 1978).

Data Collection Process

The external phase was to be completed by drawing a random sample of motorists travelling over the North Santiam Pass. This was accomplished by attaining license plate numbers of travelling cars and then contacting those drivers by telephone interviews. This phase addressed objectives one through three. To avert any potential memory problems with time lag between driving over the pass and survey application, this phase was constrained to researching the basic questions of listenership and advertising success.

The internal phase was to be accomplished by conducting several focus groups in various locations throughout Oregon, playing the messages and administering a survey. The data collected from this phase are subjective and descriptive data, except for demographics. These data look at message content and listener-responses.

Sampling Strategies

The external phase sampling design was set to achieve a random sample of people driving over the North Santiam Pass. This was accomplished with a systematic sample using a sampling interval of two hours with a random starting period. This sample was drawn by recording license plate numbers and using these to attain telephone numbers. The sample members were surveyed by telephone interviews. These interviews sought to ascertain whether or not the motorist had tuned in, or tried to tune in to the broadcast program and created a generalizable profile.

The internal phase is not designed to approximate the general public but is intended to establish how certain groups react to the messages. This sampling was purposeful in that these groups have shown previous interest and commitment to forestry education. This was done by sampling groups who seem to follow some of the demographic qualities of the actual travelling population and allowing them to hear the messages and evaluating their surveys.

IV. Analysis Plan

Since this evaluation was conducted as two separate phases the analysis plan will also be divided into two sections, external and internal.

External Data Collection

The collection of the license plate numbers began in July of 1993 and ran through August of the same year. This initial data collection centered on these summer months due to the June start-up date of the LPR program, as well as time constraints on the researcher.

The procedures governing the collection of license plate numbers were relatively simple. The researcher recorded plate numbers from moving vehicles going over the Santiam Pass. From stations on uphill curves located within the theoretical broadcast area, plate numbers were recorded by sight from vehicles travelling in either direction over the pass. The times data collection occurred were between 6 a.m. and 8 p.m. throughout the month of collection. The detailed sampling strategy is located in Appendix A.

Once the allotted amount of plate numbers were attained, data collection continued indoors. The next step in this phase of the evaluation required attaining phone numbers and calling motorists. Through the use of the Oregon Department of Motor Vehicles and various telephone directories, telephone numbers of those motorists who had driven over the Santiam Pass were acquired. Survey by telephone began in mid-August and ran through mid-September of 1993. Phone calls were conducted weekdays from 6 p.m. to approximately 8:30 p.m. and weekends throughout the day. Each telephone number received from one to five calls dependent upon successful completion of survey.

Internal Data Collection

Collection of data for the internal phase of the evaluation was conducted through the use of four separate groups. This aspect came about after the external phase of the evaluation was completed. This sample represents purposeful sampling of groups interested in natural resource education. In an attempt to create some uniformity through both phases of this evaluation, groups were chosen specifically to draw from groups which might have similar demographic characteristics as the respondents in the external phase. These groups were solicited through the Oregon State University Extension network & from personal contact through the researcher. The four groups consisted of; the Sisters' Area Chamber of Commerce Volunteer Group, a Lane County Forestry Workshop group, the Marine Water Safety Council, and Oregon State University students. These groups also had the added benefit of coming from four different geographic areas which use the pass, that is Sisters, Eugene, Portland, and Corvallis. In all but one of these settings, the groups had gathered for reasons other than participation in this project. One group came together for the specific reason to evaluate the LPR messages.

The implementation of the group surveys began with an explanation of the LPR program, then the broadcast of approximately four different LPR messages, and finally the handing out of the survey. All four meetings were held indoors in various locations and at various times.

External Data Analysis Plan

The data collected in this phase of the research was designed to answer some basic evaluation questions. The main question being asked here is if the program is being used by the general public. This was addressed by asking respondents for the following information:

- 1) Was the Forest Information sign seen? - In other words, was the individual aware of the existence of the program.
- 2) If the sign was seen, did the individual choose to tune in?

Secondary questions revolve around the associated significant demographics of the population, those utilizing the LPR radio program, as well as those who do not.

This discussion of the analysis plan of the survey data will begin with the definition of the type of information gathered. The design of this study is such that most of the information gathered is descriptive in nature. Descriptive research is generally distinguished by an orientation in the current, that is, focusing on the present (Courtney, 1991c). This survey also utilized primarily nominal data. This data was gathered by telephone survey. The actual survey tool is located in Appendix B. The data assembled represents the opinions and information from those respondents. The following table shows only the type of data collected and analysis procedure used for each question.

Table 4.1 Telephone Survey Analysis Plan

Survey Question #	Data Type	Data Analysis
1	Nominal	Chi ²
2	Nominal	Chi ²
2a	Nominal	Frequency Distribution
2b	Nominal	Frequency Distribution
3	Continuous	Logistic Regression
4	Nominal	Chi ²
5	Nominal	Log-Linear
6	Nominal	Log-Linear

Survey questions 2a and 2b gathered subjective data. All of the other survey questions were concerned with objective data. All of the survey answers were coded for ease of analysis. The codes, variables and definitions are located in Appendix F.

Analysis of the data began with simple statistics and frequency distribution tables. Then, where applicable, χ^2 tests and t-tests were performed. Upon completion of that step, logistic regression was performed on the continuous variable (question #3) to determine any significant pattern of response. Logistic regression works well in cases of coded survey responses because they usually prove sufficiently non-normal for ordinary t-tests. This type of regression analysis seeks to define probability in terms of explanatory variables. It was contingent upon that regression analysis as to whether it would prove helpful to perform log-linear modelling on the last two variables. In other words, determination of whether or not the continuous variable, age in this instance, had a significant relationship with other key variables through these tests, needed to be done before deciding whether or not it would prove helpful to add the extra variables.

Internal Data Analysis Plan

Information collected in this phase of the research was designed to answer slightly more complex evaluative questions. This section focused on what the respondent thought of the messages without thought of the tool of transmission. This phase is not meant to be representative of the general public but instead only pertains to the individuals participating in the group meetings. To address the personal opinions of the respondents concerning the messages, they were asked about the following information:

- 1) Did they enjoy the messages?
- 2) Did they think the program was useful?
- 3) Would they tune in to the program?
- 4) Did they feel that they had learned anything?

Here, as in the external phase, secondary questions revolve around the associated significant demographics of the population, as well as other message qualities. The design of this data analysis is much the same as that in the external phase. This survey also utilizes primarily nominal data. The actual survey tool is located in Appendix C. The following table shows only the type of data collected and analysis procedure used for each survey question (table 4.2). Each of the questions on the survey will be analyzed separately.

Table 4.2 Group Survey Analysis Plan

Survey Question #	Data Type	Data Analysis
1	Continuous	Logistic Regression
2	Nominal	Log-Linear
3	Qualitative	No analysis
4	Nominal	Frequency Distribution
5	Nominal	Logistic Regression
6	Nominal	Chi ²
6a	Qualitative	No analysis
7	Continuous	Logistic Regression
8	Nominal	Chi ²
9	Nominal	Chi ²
9a	Qualitative	No analysis
10	Nominal	Chi ²
11	Nominal	Chi ²
12	Continuous	Logistic Regression
13	Nominal	Chi ²

Table 4.2, Continued.

14	Nominal	Log-Linear
15	Nominal	Chi ²
16	Qualitative	No analysis
17	Qualitative	No analysis

The analysis of the internal data sets began with simple statistics and frequency distribution tables. As with the external data, where applicable, chi² tests and t-tests were performed. Upon completion of that step, logistic regression was performed on the continuous variables (questions # 1, 5, 7 & 12) to determine any significant pattern of response. Again, this regression sought to define relationships between continuous variables and other significant binary response variables. Contingency on the outcome of the logistic regression statistics determined whether or not to perform log-linear modelling on associated variables.

V. Results

External Data Analysis

These results provided information on the owner/drivers of the vehicles that had travelled across the Santiam Pass. The method of survey collection only focused on those individuals. These results make no note of those people who may have been passengers. The total number of license plate numbers collected was approximately 560. Of that number, there were 278 valid surveys attained. Response rates (49%) were affected by the inability to attain correct phone numbers, difficulty contacting people and individual respondent choice to answer survey questions. The simple demographic frequencies of the respondents are listed in the following table. These frequencies represent the entire sample group (table 5.1).

Table 5.1 Total Telephone Demographics n=278

Characteristic	Frequency	Percent
Female	115	41.4
Male	163	58.6
Age 18-24 yrs	14	5
Age 25-34 yrs	34	12.2
Age 35-44 yrs	76	27.3
Age 45-54 yrs	70	25.2
Age 55-64 yrs	48	17.3
Age 65+ yrs	24	8.6
Rural resident	49	17.6
2Urban resident	229	82.4

Table 5.1, Continued.

High school	166	59.7
College educ	87	31.2
Post-graduate	19	6.8
Recreation trip	211	75.9
Work trip	34	12.2
Transit trip	33	11.9

This table allows an overview of some demographic characteristics of the general population of drivers travelling over the Santiam Pass during the summer months of July, August and September.

The data showed that thirty percent of the sample actually saw the information sign and of that group twenty-eight percent choose to tune into the broadcast. Due to the large difference in sample population and the sub-sample who saw the program information sign, additional statistical tests were run on only those who were aware of the program. The following set of frequencies deal with only those individuals who were aware of the LPR program, n=85 (table 5.2).

Table 5.2 Group Recalling LPR Signage n=85

Characteristic	Frequency	Percent
Female	35	41.2
Male	50	58.8
Age 18-24 yrs	4	4.7
Age 25-34 yrs	14	16.5

Table 5.2, Continued.

Age 35-44 yrs	24	28.2
Age 45-54 yrs	21	24.7
Age 55-64 yrs	14	16.5
Age 65+ yrs	4	4.7
Rural resident	13	15.3
Urban resident	72	84.7
High school	45	52.9
College educ	32	37.6
Post-graduate	8	9.4
Recreation trip	66	77.6
Work trip	11	12.9
Transit trip	8	9.4

These numbers represent only those eighty-five people who did see the program advertisement sign. Comparisons of these tables could indicate whether poor advertisement was altogether responsible for differences in the analysis of the data. Cursory examination of the percentages show that the section of individuals who saw the sign does not significantly differ from the entire sample in demographic characteristics. Statistical testing of both samples showed this to be the case. Both data sets resulted in similar outcomes.

Chi-squared tests, with $p=.05$ confidence level, were run to test whether there was a significant difference between those who saw the sign and those who did not, as well as those who tuned in and those who did not, against both sex and community type. The result showed no significant difference in any of the tests (table 5.3).

Table 5.3 Telephone Chi-squared Tests (total)

Entire Sample	Sex	Community
Saw sign/Did not	p=0.96	p=0.49
Tuned in/Did not	p=0.58	p=0.82

Chi-squared tests on the portion of the sample population who saw the advertisement signs concurred with those of the entire sample population (table 5.4). There were no significant relationships found.

Table 5.4 Telephone Chi-squared Tests (pop. who saw sign)

Sub-Set	Sex	Community
Tuned in/Did not	p=0.62	p=0.66

The t-test performed on age versus those who saw the sign also showed no significant differences (p=0.69). The hypothesis that of those who saw the sign, there was a significant difference in the ages between those who tuned-in and those who did not was rejected with a value of p=0.61.

More detailed analysis, namely the use of logistic regression, performed on the age variable over both tuning in and seeing the sign of both the entire and sub-set populations also yielded non-significance as shown in table 5.5. This lack of significance makes the use of log-linear modelling of the trip purpose and education variables unnecessary. Since age has not been shown to explain tuning in or seeing the sign, associating trip purpose and education in a log-linear model over the continuous variable of age is unnecessary.

Table 5.5 Telephone Logistic Regression (Pearson's Chi²)

Variable	Tune in	Saw sign
Age (total samp.)	.1673	.1870
Age (sub-set)	.7036	-----

Internal Data Analysis

Group data collection was completed in four separate sessions. Those sessions were conducted on November 30, 1993, December 10, 1993, February 10, 1994, and April 14, 1994. The data consisted of surveys administered to four different groups with a total of fifty respondents. Procedures of administration of the survey were identical in all four groups. Separate frequency distribution tables for each of the four groups are located in Appendix D. For purposes of clarity and to attempt to apply some statistical relevance to the data acquired, the group data were merged into one file. The demographic frequencies of the merged data are as follows:

Table 5.6 Group Demographics n=50

Variable	Frequency	Percent
Female	18	36
Male	32	64
Age 18-24 yrs	4	8
Age 25-34 yrs	9	18
Age 35-44 yrs	12	24
Age 45-54 yrs	8	16
Age 55-64 yrs	9	18

Table 5.6, Continued.

Age 65+ yrs	8	16
Rural resident	17	34
Urban resident	33	66
High school educ	5	10
College educ	30	60
Post-graduate	15	30
Recreational trip	28	56
Work trip	4	8
Transit trip	18	36.0

Table 5.6 represents some characteristics of those people surveyed during the internal evaluation phase. A comparison of this table with the demographics of the sample drawn during the external phase shows some distinct similarities, as well as some differences.

Table 5.7 Telephone & Group Percentages

Variable	By Percent (External)	By Percent (Internal)
Female	41.4	36
<i>Male*</i>	<i>58.6</i>	<i>64</i>
Age 18-34	17.2	26
<i>Age 35-54*</i>	<i>52.5</i>	<i>40</i>
Age 55+	25.9	34

Table 5.7, Continued.

Rural resident	17.6	34
<i>Urban resident*</i>	<i>82.4</i>	<i>66</i>
High School educ.	59.7	10
College educ.	31.2	60
Post-grad educ.	6.8	30
<i>Recreational trip*</i>	<i>75.9</i>	<i>56</i>
Work trip	12.2	8
Transit trip	11.9	36

*Common majorities are in italics.

The major difference between the two data sets is in the educational levels. Sixty percent of the external group had only a high school education where sixty percent of the internal group had a college education. These discrepancies will not cause problems in the analysis of the data sets because there are no statistical tests run between the sets. They work in different aspects, the external group being a random sample and the internal group being a purposeful sample.

Chi-squared tests were run on a variety of different variables to test for any significant differences among the internal respondents in the ways they assessed program usefulness, enjoyability and knowledge gained. The criterion for significance was set at $p=.01$ due to the relatively small sample size involved. The following table illustrates which variables were run against each other and the associated p-values (table 5.8). The educational variable was compressed into high school and college levels.

Table 5.8 Group Chi-squared Tests

Variable	Sex	Community	Education
Usefulness	p=0.88	p=0.01	p=0.562
Learned	p=0.01	p=0.364	p=0.909
Enjoyed	p=0.46	p=0.253	p=0.304

The robustness of the chi-squared test and the low p-values of some of these results seem to indicate that the group had statistically significant differences in both how the different community groups valued the LPR program and with how the different sexes felt that they had learned from listening to the messages. Further examination of actual data, real and expected cell counts, will illustrate the manner in which the data differed. Table 5.9 on the following page details the data in the two significant tests.

These tables illustrate the actual cell counts over the expected cell counts. For example, the first table illustrates an actual cell count of 12 women responding that they felt they had learned something over the expected count of 15.12. The expected cell count illustrates the number of responses in a particular cell if indeed those two variables were entirely independent. The chi-squared tests compare those numbers to pre-set table values to test for independence. Examination of the data in the left table indicates that men felt that they had learned something from the messages more so than did the women in this study. The table on the right suggests that urbanites felt that the LPR program was useful more so than did the rural dwellers in this study.

Table 5.9 Chi-Squared Cell Counts

Sex v. Learned				Community v. Usefulness of program			
Frequency Expected	Something	Nothing	Total	Frequency Expected	Yes	No	Total
Female	12 15.12	6 2.88	18	Rural	12 14.96	5 2.04	17
Male	30 26.88	2 5.12	32	Urban	32 29.04	1 3.96	33
Total	42	8	50	Total	44	6	50

T-tests were performed on age versus enjoyment ($p=0.93$), value ($p=0.85$), and whether or not the respondents felt they learned something ($p=1.0$), and all proved non-significant. The hypotheses that the age of the respondents made a significant difference in any of these areas are rejected.

Logistic regression was run on the age of respondent, percentage of new material, and the number of trips over the Santiam Pass against usefulness of the program, whether or not the respondent felt they had learned something, and finally whether or not the respondent enjoyed the messages. The following table illustrates the variables on which regression tests were run and the associated p values.

Table 5.10 Group Logistic Regression (Pearson's Chi²)

Message variable	% New Material	Trips/year	Age
Learned	p=0.059	p=0.323	p=0.165
Useful	p=0.711	p=0.047	p=0.170
Enjoyed	p=0.042	p=0.365	p=0.938

Here again the small sample size suggested the determining factor of a p value of .01 for testing statistical significance. Changing the associated p-value works to create a more robust tests when dealing with various sample sizes. Upon evaluation, none of the regressions yielded significant reactions. The findings of non-significance make any log-linear modelling of any other variables (education, or purpose of trip) against these variables unnecessary.

VI. Conclusions

External Conclusions

Simple frequency statistics show interesting data about the population of summer drivers over the Santiam Pass. The dominant profile of the traveller is a 43 year old man who considers himself an urbanite. Our typical traveller has a high school education (60.1%) and is travelling over the pass for recreational purposes (76%). More detailed statistical analysis gathered from the data shows that there were no significantly different characteristics of individuals who saw the LPR information sign and those who did not. Neither were there any significant characteristics associated with those individuals who tuned in and to those who did not.

Analysis of the population who saw the sign showed that about 28% chose to tune into the broadcast. Of the 72% of the sub-set (n=85) who did not tune in, 43% (or another 37 people) simply could not tune in the broadcast, that is, they could not receive transmission of the LPR broadcasts. This data suggests 13% of the total respondents, and nearly 72% of the sub-set who saw the signs, at least attempted to tune in.

Internal Conclusions

Results from the analysis of the group data seem to indicate that the internal demographics have some similarities with the external group. The average age of the respondents was 46 years. The main reason for travelling over the pass was for recreational purposes (56%) and the majority of respondents considered themselves as living in an urban environment (66%). The average number of trips over the pass per year was 4.56. The most obvious difference in the demographics of the two phases is the

educational level. As opposed to thirty-two percent of the external batch, sixty percent of the internal group respondents had attended college.

Although the sample size for the group data is small, it did seem to indicate some significant reactions. Evaluation of the data shows that there is a significant difference between how community groups evaluate the usefulness of the program. The urban respondents considered the program useful more consistently than rural dwellers. Further analysis of the data indicate that men responded positively to learning material from the messages more often than did women. Educational background showed no statistical significance in the respondent's value, knowledge gained, or enjoyment of the messages.

The regression statistical tests show some indication that those individuals who felt much of the material was new to them also felt that they had learned something and had enjoyed the program. Another intimation of the results suggests that the number of trips over the Santiam Pass per year had an influence on whether or not the respondent felt the program was useful. These tendencies were not statistically significant considering the small sample size. This conservative assessment of the statistical tests simply suggests that there may be a relationship in a larger sample size.

Frequency assessment gives an overview of the group appraisal of the program. The majority of respondents felt that the messages were an adequate length (64%) and of good sound quality (68%). Most respondents also agreed that the program is useful (88%) and that they had learned something (84%). Seventy-eight percent of those asked enjoyed listening to the LPR messages and fifty-six percent thought that they would tune in again. These frequencies can imply an overall assessment of what the groups made of the messages and the idea of the LPR program.

Informal Descriptive Conclusions

Part of the information gathered in the internal phase of the evaluation was descriptive. These descriptive survey responses were solicited in several areas; what was

learned, overall enjoyment and satisfaction with the program, and suggestions for new topics or improvements.

The taped messages that were played for review were uniform throughout the four groups. The three messages dealt with wilderness permits, Green Teams, and an aerial survey of forest types. The message scripts for those three messages are located in Appendix G.

Virtually all participants were able to glean the major themes of each of the messages. The mean percentage of new material contained within the messages was 32.42. Of the 84% who believed they had learned something, most responses centered around the acquisition of permits and the volunteer Green Teams. Others felt that much of the material was a review of information they had previously known. Forty-two percent of those asked had suggestions for new LPR topics. A compiled list of new suggested topics is located in Appendix E.

The overall program assessment drew some interesting responses. The majority of them were very supportive. They supported the idea of public education and the material of the current messages. Of those responses which were slightly more critical most claimed that the amount of information should increase and decrease the amount of "chit-chat," that is, unnecessary dialogue. Other participants felt that the format was slightly "silly" for an adult audience. The number of entirely negative responses to the program were very few. Those seem to revolve around a lack of interest rather than a critique of the program itself.

VII. Discussion

This evaluation began with the aim to assess some measure of program effectiveness. As previously mentioned, these results were gained on the proto-type LPR site (Santiam) which has been found to be sub-standard in some mechanical aspects. Ideal conditions for the implementation of a LPR broadcast relate to area topography, soil depth and moisture content, and transmitter distance from target audience (Bondi, 1994). In all of these respects, the Santiam Pass site fell short of expected outcomes. The station is located on a butte top composed of rock and rests about a mile in from the targeted highway. The thin soil layer, low moisture content, and mountainous terrain create hostile conditions for radio transmissions. This evaluation was done under those mechanical problems which may have effected respondents' ability or desire to tune in to the broadcast. The U.S. Forest Service has since attempted to alleviate some of these problems by upgrading the transmitter ground system and optimizing the antenna power.

The results gained in this study are of two different kinds. The external phase results can be extrapolated to the general population of drivers travelling over the Santiam Pass during the summer. The internal phase results can only be associated with the specific groups that were surveyed. There has been an attempt to point out some similarities between the two phases but there are no conclusions which can be based on that.

The external phase of this evaluation has been productive in giving indications of the success of low power radio broadcasts as an educational tool. One conclusion which can be drawn from this phase seems to indicate that there is a problem with program advertisement. Publicity of the LPR program seems to be an issue. Over the entire random sample (external), it would seem that the program is only slightly successful in reaching the target population (8% tuned in). Of the respondents only 30% were even aware of the program. Of those who were aware of the program, listening response rates

were higher (24% tuned in). The data in this phase show no correlating evidence between any demographic characteristics and response to the program.

The internal phase gave insight into some program listeners' assessment of the messages. The majority of respondents seemed to enjoy the program messages and felt that the LPR program was useful. The high percentage of individuals (56.0) who said they would tune in to the program again gives a clear indication of the attitude of the groups to the messages.

Overall, these conclusions are drawn on a relatively small sample size which can affect the strength of these results. This evaluation simply provided an overview of the reception of this LPR program. The Santiam Pass LPR program shows promise with the innovative scripts and message content. The groups surveyed enjoyed them and felt that the program was a useful one. Problems with the program come from the LPR tool itself. Poor advertisement and mechanical problems with transmission reduced participation among the target audience.

VIII. Recommendations

At this point of the evaluation I would like to add some personal observations regarding reception and recommendations of the LPR program. My general feeling about the reception of the program is that it was received by the group participants very well. They seemed to enjoy listening to the messages and welcomed the idea of educating the public about forestry issues. The responses on the questionnaires leads me to believe that the content of the messages is effective in communicating broad themes. The demographic information may help to re-evaluate the target audience for the Santiam Pass site. Perhaps a thorough need-assessment of the target audience before message creation may prove useful. This could include previewing messages with focus groups before implementation.

It seems that the real issues, in terms of program effectiveness, revolve around publicity. The constraints regarding advertisement of the LPR program on-site, that is the state regulations governing roadside signage, provide little room for improvement. The highway department maintains strict control over the types of signs, colors, logos, sizes, and placement, as well as the number of signs permitted. Suggestions for circumventing this problem might be to increase off-site advertisement practices. Networking this program with other forestry education programs through multiple agencies could increase public awareness of the program. State-wide employment of the LPR programs could also increase public appreciation.

This evaluation attempted to create an overview on the Santiam Pass LPR project effectiveness. Intense scrutiny into the educational capabilities and constraints of radio education is left to future studies. Recommendations concerning subsequent evaluations of LPR programs would be to promote and use on-site surveys. The creation of way-side stations or stations at specific locations might offer a better opportunity to analyze the program in use and create a synthesized evaluation from a random sample.

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X. Appendices

Appendix A

Table A.1 License Plate Sampling Strategy

Time	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
6-8 a.m.	8	2	3	11	5	6	14
8-10 a.m.	15	24	10	18	12	20	29
10-12 a.m.	8	16	25	26	19	20	14
12-2 p.m.	1	2	3	4	5	6	7
2-4 p.m.	15	9	10	18	12	13	21
4-6 p.m.	23	16	17	11	27	28	21
6-8 p.m.	1	9	17	4	19	13	7

*Numbers in blocks represent the days spent at location. For example, the first day of sampling occurred on a Monday and took place from 12 to 2 p.m. and again from 6 to 8 p.m.

*Days divided into two-hour block

*Traffic Count = 2400 cars per day average

*Approximately 11 plates per block

-Every 18th car will be recorded

-1 hour (or after collecting about six plate numbers) spent recording eastbound traffic, then at the beginning of the next hour in the block time was spent recording plates of westbound traffic.

*Obtained approximately 550 plate numbers

*Sampling approximately two blocks per day will require approximately 29 days

*Rates of collection varied from block to block but none significantly enough to cause problems.

Appendix B

LPR Telephone Survey

* Screening question: "Have you recently driven over the Santiam Pass, where highway 20 & 126 join?"

1) Did you notice the blue "Forest Information" highway signs?

- 0 = No
- 1 = Yes
- 9 = DK/NA

2) The Forest Information sign gives you an a.m. radio station, 1610, to tune to; Did you tune into the Forest Information programming?

- 1 = Yes
- 2 = No*

*2a) Why didn't you tune in?

- 0 = Doesn't apply
- 1 = DK/NA
- 2 = No radio
- 3 = Couldn't tune in station
- 4 = Couldn't read station number off sign
- 5 = Listening to other (tape, cd, etc.)
- 6 = No interest **

**2b) Why weren't you interested?

- 0 = Doesn't apply
- 1 = Politics/bureaucracy behind messages
- 2 = Don't care
- 3 = Bad past experience with low power radio

3) Age group:

- | | |
|-----------|-----------|
| 1 = -18 | 5 = 45-54 |
| 2 = 18-24 | 6 = 55-64 |
| 3 = 25-34 | 7 = 65+ |
| 4 = 35-44 | 9 = DK/NA |

4) Community designation:

- 1 = Rural
- 2 = Urban
- 9 = DK/NA

5) Level of completed education:

- 1 = Primary school
- 2 = Secondary school
- 3 = College
- 4 = Post-grad
- 9 = DK/NA

6) Primary Purpose of trip:

- 1 = recreation
- 2 = work
- 3 = travel
- 4 = DK/NA

Appendix C

Personal Interview Low Power Radio Questionnaire

SITE _____

DATE _____

1) How often would you say you travel over the Santiam Pass per year?

TIMES PER YEAR _____

2) Generally speaking, what is (are) the primary purpose(s) of your trip(s) over the Santiam Pass?

RECREATION.....1

WORK-RELATED.....2

VISITING.....3

TRANSIT.....4

OTHER.....5 _____

DK/NA.....9

After listening to the Forest Talk messages please answer the following questions:

3) What major themes, if any, do you recall?

4) Did you find the message length too long, adequate, or too short?

TOO LONG.....1

ADEQUATE.....2

TOO SHORT.....3

5) How would you rate the production sound quality of the message; good, adequate, or poor?

GOOD.....1

ADEQUATE.....2

POOR.....3

6) Overall, do you think these messages provide a useful service?

YES.....1

NO.....2 -----If not, please answer 6a:

----> 6a) Why don't you think the service is useful?

7) Of the information presented to you, about what percentage of it, would you say, was new to you?

PERCENTAGE NEW _____
DK/NA 999

8) What would you say you have learned from the message(s)?

NOTHING.....1

SOMETHING.....2 -----If something, please describe:

9) Did you enjoy listening to Forest Information?

YES.....1

NO.....2 -----If not, please answer 9a:

----> 9a) Why didn't you enjoy listening?

10) How likely is it that you would tune in to the Forest Information program?

DK/NA.....1

VERY LIKELY.....2

SOMEWHAT LIKELY.....3

SOMEWHAT UNLIKELY....4 -----If unlikely, please answer 10a:

VERY UNLIKELY.....5-----If unlikely, please answer 10a:

----> 10a) Why is it unlikely that you would tune in?

11) Do you have any suggestions for new Forest Talk topics?

YES.....1 ----If so, please describe:

NO.....2

Here follow some personal questions which will help us in creating programs suited to their audiences.

12) What is your age group?

- 18.....1

46-55.....5

18-25.....2

56-65.....6

26-35.....3

65+.....7

36-45.....4

DK/NA.....9

13) Would you say that you live in an urban or rural setting, that is, in a city or in the country?

RURAL.....1

URBAN.....2

DK/NA.....9

14) What is your highest completed level of education?

PRIMARY SCHOOL.....1

SECONDARY SCHOOL.....2

COLLEGE/UNIVERSITY...3

POST-GRADUATE.....4

DK/NA.....9

15) You are: FEMALE.....1 or MALE2

16) What did you think of the Forest Information message(s) overall?

17) Is there anything else concerning the Forest Information program you'd like to say?

Thanks for your time. Your input will be used to help produce more effective and enjoyable public education programs.

Appendix D

Group Survey Assessment of LPR

All Four Groups

- 1) Sisters Area Chamber of Commerce Volunteers (Sisters, OR) 10 respondents
- 2) Oregon State University Students (Corvallis, OR) 16 respondents
- 3) Extension Forestry Group (Eugene, OR) 13 respondents
- 4) Marine Water Safety Council (Red Cross) (Portland, OR) 11 respondents

Table D.1 Detailed Group Demographics

<i>Demographics</i>	<i>#1 SACCV</i>	<i>#2 OSU</i>	<i>#3 EXT</i>	<i>#4 MWSC</i>
<i>Sex</i>	<i>Freq / Percent</i>	<i>Freq / Percent</i>	<i>Freq / Percent</i>	<i>Freq / Percent</i>
<i>Male</i>	5 / 50	9 / 56.3	10 / 76.9	8 / 72.3
<i>Female</i>	5 / 50	7 / 43.8	3 / 23.1	3 / 72.7
<i>Education</i>				
<i>High school</i>	2 / 20	0	3 / 23.1	0
<i>College</i>	5 / 50	10 / 62.5	7 / 53.8	8 / 72.7
<i>Avd. Degree</i>	3 / 30	6 / 37.5	3 / 23.1	3 / 27.3
<i>Community</i>				
<i>Rural</i>	8 / 80	16 / 100	7 / 53.8	2 / 18.2
<i>Urban</i>	2 / 20	0	6 / 46.2	9 / 81.8

Table D.1, Continued.

<i>Age Group</i>				
18-24	0	2 / 12.5	2 / 15.4	0
25-34	0	8 / 50	1 / 7.7	0
35-44	0	6 / 37.5	3 / 23.1	3 / 27.3
45-54	2 / 20	0	2 / 15.4	4 / 36.4
55-64	4 / 40	0	3 / 23.1	2 / 18.2
65+	4 / 40	0	2 / 15.4	2 / 18.2

Table D.2 Detailed Group Data on LPR Messages

<i>Message Info</i>	<i>#1 SACCV</i>	<i>#2 OSU</i>	<i>#3 EXT</i>	<i>#4 MWSC</i>
<i>Length</i>	<i>Freq / Percent</i>	<i>Freq / Percent</i>	<i>Freq / Percent</i>	<i>Freq / Percent</i>
<i>Too long</i>	3 / 30	8 / 50	2 / 15.4	3 / 27.3
<i>Adequate</i>	7 / 70	8 / 50	9 / 69.2	8 / 72.7
<i>Too short</i>	0	0	2 / 15.4	0
<i>Sound Quality</i>				
<i>Good</i>	7 / 70	11 / 68.8	8 / 61.5	8 / 72.7
<i>Adequate</i>	3 / 30	5 / 31.3	5 / 38.5	3 / 27.3
<i>Poor</i>	0	0	0	0
<i>Usefulness</i>				
<i>Useful</i>	7 / 70	15 / 93.8	12 / 92.3	10 / 90.9
<i>Not useful</i>	3 / 30	1 / 6.3	1 / 7.7	1 / 9.1
<i>Learn</i>				
<i>Something</i>	6 / 60	14 / 87.5	13 / 100	9 / 81.8

Table D.2, Continued.

<i>Nothing</i>	4 / 40	2 / 12.5	0	2 / 18.2
<i>Enjoyment</i>				
<i>Enjoyed</i>	6 / 60	11 / 68.8	11 / 84.6	11 / 100
<i>Did not Enjoy</i>	4 / 40	5 / 31.3	2 / 15.4	0
<i>Tune in again?</i>				
<i>Very Likely</i>	3 / 30	0	5 / 38.5	2 / 18.2
<i>Some likely</i>	1 / 10	6 / 37.5	4 / 30.8	6 / 54.5
<i>Some. unlikely</i>	2 / 20	8 / 50	2 / 15.4	3 / 27.3
<i>Very unlikely</i>	4 / 40	2 / 12.5	2 / 15.4	0
<i>Topics</i>				
<i>Suggestions</i>	5 / 50	4 / 25	10 / 76.9	2 / 18.2
<i>No suggestions</i>	5 / 50	12 / 75	3 / 23.1	9 / 81.2

Appendix E

Results from the Group survey --

Suggestions for new Forest Information topics

- 1) Water safety for boating & fishing within the forests.
- 2) Winter forest safety
- 3) General forest safety
- 4) Litter procedures
- 5) Local history
- 6) Names and sources of geographical features
- 7) Indigenous cultures
- 8) Importance of snow & rain to a healthy forest
- 9) Forests as renewable resource
- 10) Recreation opportunities in the forest
- 11) General forest science (biology, hydrology, etc.)
- 12) Alternative products from forests
- 13) Watersheds /purposes
- 14) Forest diseases
- 15) Fire management & care
- 16) Where else to go for information
- 17) Silvicultural aspects of forest management

Appendix F

1) Variable Format Form:

Table F.1 Variable Format, Telephone Survey

Variable Name	Format*	Coded?	Null?
Sex	A 1	Y	N
Sign	I 1	Y	N
Tune	I 1	Y	N
Dtune	I 1	Y	N
Interest	I 1	Y	N
Age	I 1	Y	N
Commun	I 1	Y	N
Educ	I 1	Y	N
Purpose	I 1	Y	N

Table F.2 Variable Format, Group Survey

Variable Name	Format	Coded?	Null?
Times	I 2	Y	N
Purpose	I 1	Y	N
Length	I 1	Y	N
Sound	I 1	Y	N

Table F.2, Continued.

Use	I 1	Y	N
New	I 3	Y	N
Learn	I 1	Y	N
Enjoy	I 1	Y	N
Tagain	I 1	Y	N
Topics	I 1	Y	N
Age	I 1	Y	N
Commun	I 1	Y	N
Educ	I 1	Y	N
Sex	A 1	Y	N

*Format key: A = letter, I = numeral

2) Variable Description

Table F.3 Variable Description, Telephone Survey

Variable Name	Variable Description
Sex	Sex of respondent.
Sign	Was LPR sign seen?
Tune	Did respondent tune in?
Dtune	Why didn't respondent tune in?

Table F.3, Continued.

Interest	Why wasn't respondent interested in LPR?
Age	Age of respondent.
Commun	Rural or urban community?
Educ	Educational level of respondent.
Purpose	Main purpose of trip over Santiam Pass.

Table F.4 Variable Description, Group Survey

Variable Name	Variable Description
Times	No. of trips per year
Purpose	Main purpose of trips
Length	How was message length?
Sound	How was message sound quality?
Use	Was program considered useful?
New	How much material was new?
Learn	Did respondent learn anything?
Enjoy	Did respondent enjoy messages?
Tagain	Would respondent tune in?
Topics	Any suggestions for new topics?

Table F.4, Continued.

Age	Age of respondent
Commun	Rural or urban community?
Educ	Educational level of respondent?
Sex	Sex of respondent

Appendix G

Message Scripts

1) Wilderness Use Permits

Man: "Boy, traffic was heavy tonight. I'm sure glad it's Friday and our trip into the Mount Jefferson Wilderness begins tomorrow."

Liz: "Oh, I know. Me too."

Man: "How far along did you get on packing last night Liz?"

Liz: "Not very far but I can't wait to get on the trail too. The weather looks perfect."

Man: "What's on the menu? Something good?"

Liz: "After the fiasco last year, you bet something good. How's this sound?

First night, fettucini alfredo, fresh vegetables, and maybe some fresh strawberries for desert. And the second night my famous backpack seafood stew, fresh fruit and sour dough bread. I'm bringing some fresh-baked chocolate chip cookies but I'm going to keep them in my pack."

Man: "That menu sounds great! Now let's double check the list and make sure we've got everything. Sleeping bags, water filter,..oh, remind me to get the wilderness permit at the ranger station on the way up."

Liz: "Well this time you're in luck. I already sent away for one and got it in the mail the other day. Some ranger stations have cut back on their office hours so I thought I'd just write to the local forest service office to get the permit."

Man: "Well good. We don't have to worry about that now. It still seems strange to need a permit. I'm used to the good old days when we didn't need one."

Liz: "I know. You're right, but remember the last time we were at Green Lakes and how crowded it was? I think it's about time the Forest Service did something to control use."

Overvoice: "For now, permits are only required in the Mount Jefferson, Mount Washington and Three Sisters Wilderness areas. There are no restrictions on who

can get permits. But remember, you have to get one for overnight camping from either a Forest Service office or a retail outlet that has them. Permits for day use are available at trailheads."

Message Script

2) Green Team

John: "Today we want to focus on one of the innovative programs the Deschutes National Forest is offering this summer. Let's go out to Suttle Lake and talk to Mike about the Forest Green Team"

(Pause)

"Hi Mike. What is this Green Team? Sounds a lot like the Dream Team to me."

Mike: "Welcome to Suttle Lake John. Actually the Green Team is sort of a dream team. The program gives the public the chance to get involved in the maintenance of our campgrounds. Because of current fund levels in the Deschutes National Forest, some of the jobs that need to get done just aren't getting done."

John: "This sounds like a program where people can truly make a difference. What do the volunteers get out of it?"

Mike: "Well first, they get the satisfaction of actually making a difference. The work they do will make the campgrounds a cleaner and nicer place to stay and ensure that they hold up for future generations. And second, for each task a Green Team member accomplishes, he or she receives a shoulder patch or a Green Team lapel pin and a certificate of accomplishment. It's our way of saying thanks for a job well done."

John: "It sounds like a great program. How does someone go about joining the team?"

Mike: "You can join the team as an individual, with your family, or with a group of friends. Right now, we only have the program in operation in a few selected campgrounds in the Deschutes National Forest and we think the program will grow. We have it in operation in campgrounds here at Suttle Lake and at several other campgrounds on the south end of the Forest. Stop by the Sisters Ranger District Office for locations and for more information."

John: "And there you have it folks. I hope this stimulates you to join the Green Team."

Message Script

3) Aerial Forest Tour

Sounds as though coming over an airplane speaker.

Pilot: "Good afternoon ladies and gentlemen. This is your pilot speaking. We're now approaching Eugene municipal Airport. We're descending Gradually over the Cascade Mountains. Passengers on the right side of the plane will see Three-

Fingered Jack and Mount Jefferson. On the left side of the aircraft passengers can see Mount Washington, a sharp, snow-covered peak. The three mountain peaks in the distance are called the Three Sisters. All the green down there is Oregon's famous forests and if you look closely, you'll see dark brown or black areas that have been recently logged. But you'll also see a mosaic of different shades of green. The lighter green shades are younger forests that were planted after fire or harvesting. The darker green areas are mature or old-growth trees. The different greens of the forests and meadows, interwoven by streams, fit together like parts of a puzzle. It always amazes me whenever I fly this route to see the different shades of green. Healthy young forests and old growth trees, open areas, as well as dense forests, wilderness areas and multiple use forests."

(Background)

Stewardess: "Can I take that glass for you?"

Passenger: "Yeah, sure."

(Foreground)

Pilot: "I've just received notice that we've been cleared to land in Eugene. I hoped you've enjoyed your aerial tour. We'll be starting our descent in about five minutes. Please make sure your seatbelts are fastened and prepare for landing. We'd like to thank you for flying with us and hope you have a chance to enjoy those beautiful Oregon Forests."