Use of visual assessment surveys for planning in agricultural landscapes

by

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DEDICATION

This work is dedicated to the memory of Dr. Norman Dietrich, Professor of Landscape Architecture. I would never have attended graduate school without his encouragement. His life ended too early and I will truly miss his professional wisdom and guidance.

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PREFACE

Small town and rural planning was the focus of my graduate studies in landscape architecture and community and regional planning at Iowa State University. Upon finishing my course work, I knew that I wanted to develop a thesis topic that would not only increase my knowledge in this area, but also develop a method or tool that could help rural governments with limited financial or human resources.

Dr. Norman Dietrich, my landscape architecture major professor, encouraged me to research the visual assessment process. Dr. Dietrich was preparing for a studio, Landscape Architecture 463—Comprehensive Landscape Planning, where students were to develop a Critical Resource Study for Story County. He felt this would be a good opportunity to develop and test a visual assessment process that rural governments could use with little outside assistance. He felt this would not only be a beneficial tool, but also provide a good opportunity for students to work on a project that involved public participation, survey development and evaluating the process.

Two students were assigned to assist me in this part of the Critical Resource Study. They had some knowledge of photography techniques and image editing. Rich Olson used his 35mm camera and shared his abilities in photography, while Kirby Hoyt did additional research and development on image editing and used his knowledge to develop photographs where the images were altered to reflect changes in the landscape due to development or changes in agricultural practices.

When the studio completed its task in May 1995 and the Critical Resource Study was completed and presented to Les Beck, Story County Planner, I began the process of further researching visual assessment survey processes to determine if

there was any way to improve on what we did in the studio to increase the potential for use of the visual assessment process in rural planning.

ABSTRACT

There is a need for developing and testing a visual assessment survey method for rural regions with limited human and financial resources. The research began as part of the Landscape Architecture Studio 463 (Comprehensive Landscape Planning) where students were asked to develop a Critical Resource Study for Story County. Three members of this studio were assigned to a team to develop and test a visual assessment survey method.

The team established a goal of developing and testing a visual assessment survey model. Objectives established the Ballard Creek Watershed and Ballard Community School District located in southern Story County, Iowa as the study area for the model and the locations for testing the visual assessment survey. Geographically, he Watershed and the School District cover approximately the same area (the Ballard Community School District is a little larger than the watershed).

Landscape characteristics for use in the model were established using existing landscape elements from the region. Photographs were taken of each characteristic. Two methods were tested: one using black and white photographs mounted on photoboards and one using color slides. A survey instrument was developed in which respondents could rank each photograph or slide on a scale of 1 to 5, with 1 being Strongly Dislike and 5 being Strongly Like. The model was first tested in February, 1995 at the Ballard Community School District with students in Grades 6, 10 and 11.

The visual assessment survey methods developed by the team members were then tested in a county-wide workshop sponsored by the Story County Conservation Board and again for the Story County Planning and Zoning Department to study the feasibility of developing a trail along Indian Creek. There were no major complications

in either test. The results of the survey were not tabulated and ranked for the Ballard Community School test, but survey results were tabulated and ranked for the Story County Workshop and presented those attending..

All three tests of this basic visual assessment survey method suggest that model results would be effective as part of a comprehensive planning process for rural regions. The information given by respondents provided additional information for developing land use regulations and policies that focus on residents values, including those concerning visual resources.

CHAPTER ONE. INTRODUCTION

Assessing what people value in the landscape should be an important part of any planning process. Assessing a landscape involves examining features such as soils, topography, vegetation, hydrology, geology as well as the cultural and economic features that impact the landscape. Studying these features helps to determine what areas are suitable for certain types of activities. Another layer, or feature, to any landscape analysis should be the visual landscape.

What the everyday world looks like is becoming recognized as a matter of importance by public policy makers (Zube vii). During the 1960s and 1970s the visual quality of the American landscape became a topic of increased concern (Smardon 4). This concern was focused on both rural and urban areas. It was during this time that professionals began to study ways to measure the visual quality of the landscape. Landscape architects, planners, engineers, and foresters began researching and developing methods to measure people's preferences in the landscape.

Survey methods evolved which tested what elements and views in the landscape people preferred most. These surveys were conducted by professionals and involved processes that needed background and training in visual aesthetics research and methods. This type of technical approach is best, especially if the results become part of a legal conflict. However, many rural areas do not have access to this type of technical expertise or the necessary funding to conduct these types of visual assessment surveys.

There is a need to develop a basic process for a visual assessment survey that is understandable and straight-forward for those professionals and non-professionals who have some level of understanding of the elements of the landscape, but do not have access to or knowledge about computer programs for image editing or statistical analysis of surveys results.

A visual assessment survey can provide additional information that can be helpful in determining what residents prefer to view in the rural countryside in which they live. When preparing comprehensive plans for rural areas, planners can examine the visual preferences of the public when determining the location of certain land uses. One of the most difficult tasks facing planners is the 'objective' evaluation of social parameters that are 'subjective' by nature. The assessment of visual amenities of landscape types is a prime example, and the difficulties associated with an appraisal of its merits have often lead to its total neglect. Scenery is a resource which can be considered along with other resources if good planning decisions are to be made. Visual preference surveys help to quantify those subjective elements of the landscape to justify land use decisions (Wright 307).

Zoning ordinances can be written to reflect the visual values of the public by protecting certain resources identified as being "critical" or "special." Subdivision ordinances, planned unit development ordinances and mining and mineral extraction ordinances are examples of ordinances that do not always reflect visual values, but can after those "special" or "critical" are identified by the public. Special planning tools, such as overlay district zoning ordinances, can also be implemented in addition to the standard ordinances to protect critical or special natural or cultural resources in the

rural countryside. (Overlay zoning ordinances are special regulations that "lay over" existing regulations.)

One of the most difficult tasks in preserving the rural character or countryside is defining specifically which elements are most desirable and to focus on methods of preserving them (Heyer 1). Visual preference surveys can aid in determining what visual resources residents value and in turn this can lead to policies that will save resources that have value beyond the visual. For example, if residents prefer views with trees and native vegetation along streambanks, this may encourage better stream bank management. Trees and grasses are not only important visually, but also an integral component in managing erosion along stream banks and filtering out chemicals from industrial and agricultural activities.

Visual preference surveys also provide another means for public input. Local residents or visitors to a region would have an opportunity to express what aspects of a particular landscape they find appealing. The surveys become part of the public process of planning and developing policies for land use. This gives decision-makers an opportunity to understand what the residents want and will accept.

If the public is given the opportunity to become involved in the decision-making process, it may remove the perception of a political process that is unfair. A major purpose of public involvement programs is to ensure visibility and equality of access to the decision-making process. When decisions are controversial, public involvement is a means of demonstrating the equity of the decision-making process to the public (Creighton 25). By using visual preference surveys as part of the public involvement process, people can voice what they prefer to see in the landscape so that the political

actions taken to preserve, enhance, or design areas that will not be in conflict with their values.

There are factors that need consideration when developing and administering visual preference surveys. The methods in this research involve a survey of the public, who may have limited knowledge of the landscape. Their responses are influenced by the content and formal qualities of the landscape they are viewing, their relationships to the landscape, and the general setting and visual relationships of the objects in the landscape. In other words, their values in relationship to the landscape will influence what they prefer visually in the landscape (Schauman 105). For example, a farmer may prefer to see fields of row crops more than large areas of trees and grasses because that is how he/she makes his/her living, his/her landscape values are built on his/her economic values. A person who enjoys bird watching will place higher values on landscapes that enhance wildlife habitats. Their values are based on many things; their experience, history, culture and knowledge, which affects what they understand in the landscape.

Another limitation is the amount of additional time this process can take in the larger context of an overall planning process. It takes time to determine the specific goals of visual assessment surveys, assess the landscape and determine what photographs are necessary, prepare the survey instrument, conduct the survey, analyze the results of the survey, and decide how the results can be used in the planning process. It is reasonable to ask whether or not the value of the information received from the public justifies the additional time and expense (Creighton 20). This has been an ongoing debate about the value of public involvement. Many times

planners and decision-makers place greater value on efficiency and cost than discovering resident's values through public involvement.

Another answer to that objection is that public involvement is expensive and that no one said democracy is cheap, just better than the alternatives. The costs of public involvement are at least in part the costs of beginning to establish a new social consensus (Creighton 20). It may add cost, but it provides an essential function that broadens the base of obtaining information for planning purposes.

The benefits of visual assessment surveys in the planning process exceed what costs there may be by providing additional opportunities for public involvement and building a firmer foundation for land use regulations that preserve and enhance the countryside's natural and cultural resources.

CHAPTER TWO. LITERATURE REVIEW

Introduction

Three areas were examined during the research and development phases of the visual assessment survey project for use by local agencies and volunteers:

1) Role of public involvement in visual assessment surveys
2) Methods for visual assessment surveys
3) Value of visual assessment surveys for landscape assessments in comprehensive planning

Most of the following research and literature review was conducted after development and testing of the survey. However, work done by Sally Schaumann, Carolyn Adams, and Gary Wells was studied extensively before the survey was written and photographs were taken of the Ballard Creek Watershed area. This research is discussed in "Chapter Three. Methods."

Public Involvement

Determining people's visual preferences in local and regional landscapes can and should be an important part of a community's or county's overall planning process. Understanding people's visual preferences can enhance planning efforts by adding the element of aesthetic values to those local values that affect land use, economic development, housing, and infrastructure. Visual assessment surveys can aid in determining people's visual preferences, and they are also another method of involving the public in the planning process.

Public involvement should be a key element in any comprehensive planning process. Visual assessment surveys are another tool that can be utilized in developing comprehensive plans. They can add another layer of information to the decision-making process of local and regional governments and help planners to organize our surroundings in more generally satisfactory ways. Public involvement should also be part of the developing and administering of the visual assessment survey.

Landscape assessment is primarily a function of planning. Its primary reason for existence is to aid in the solution of problems in the "real world." The usefulness of landscape assessment as a tool depends on what is being assessed and for whom. The landscape must be assessed not only in terms of human-environment relations, but also human-human relations. Human senses are what ultimately determine whether or not an environment is desirable or livable (Zube 68).

The first and most difficult task in preserving and enhancing rural character is to define very specifically which elements of the community's rural character are most desirable and to focus on methods of preserving or enhancing them. Which characteristics should be preserved or enhanced? Obviously, these will vary from community to community. Some might include distant views, rolling topography, country roads, open space, tree lines, barns and silos, ponds, and other specific attributes that people value. The idea is to distill the general goal of preserving and enhancing rural character into its most basic and specific elements. The compilation of this "wish list" is not as simple a task as it might first appear. As part of the comprehensive plan process, these goals are often given short shrift. To be truly effective, these goals should be carefully studied and debated (Heyer 1). One way to effectively do this is through public involvement.

What is public involvement? Public involvement is called many different things:

- Public participation;
- Citizen participation;
- Community participation

For the purposes of this thesis, the term 'public involvement' will be used to represent the process that informs, as well as solicits values and ideas from people. The term 'public', for purposes of this thesis, includes the legal residents of a municipality, district or region that will be impacted by changes in policies due to updating or developing a new comprehensive plan (Creighton 4). They are not only voters and taxpayers, but also members of many different local groups, agencies and organizations. They are also known as stakeholders, the people who will receive benefits or pay the costs due to changes in land use regulations and policies.

James Creighton (3) addressed public involvement by defining it as a process by which interested and affected individuals, organizations, agencies, and government entities are consulted and included in the decision making by a government agency or corporate entity. Zimmerman (726) also defines it as involvement in any organized activity in which individuals participate without pay in order to achieve a common goal.

Zimmerman's definition refers to those voluntarily participating, those that are not paid for their expertise and time. There are times when participants in public involvement activities may receive compensation for participating in public meetings. Professionals may use compensation to increase attendance or response rates to surveys. Compensation may be monetary or some type of gift.

People's interest in land use regulation and policy is nothing new. People throughout history have been motivated to control their environment. The political

discussions of the founding fathers of the United States centered around the role of local participation. The New England Town Meeting at which attendance was expected and where each citizen could voice his or her opinion was a model expression of local public involvement To solve problems Americans traditionally formed groups to rally around an issue. At first, elected officials conducted the day-to-day operations for local governments. This resulted in widespread corruption which led to a call for reform of local government. The good government movement called for professional managers to replace elected officials in the running of the local governments. This resulted in the separation of citizens from the decisions about their local environments (Hester 42). In the late 1940s and during the 1950s a body of literature distinct to community development began to emerge. It was at this point in history that community development was defined as a movement designed to promote better living for the whole community and the active participation on the part of the community. This continued into the 1960s (Phifer, et al. 28)

Increasingly, during the Civil Rights Movement of the 1960s, public involvement became an important part of the plan development process. When local governments involved residents in assessing local conditions, it broadened the understanding at the community level of the factors involved in the planning and decision-making process (So 84).

Another outgrowth of this era was the widespread understanding of the benefits of public involvement. Some of the benefits include the following: 1) improves the social suitability of plans, 2) supports democratic principles, 3) builds self-esteem, 4) educates citizens and designers, 5) empowers citizens, 6) creates environmental justice, 7) builds a sense of community, 8) creates visionary social change,

9) encourages stewardship of place, (10 shares the joy of creating, (11 introduces innovations, and (12 provides health benefits (Hester 46).

The key to public involvement is to consider the impact of land-use actions beyond the immediate. There should be a systematic thinking process in local problem solving to increase awareness of the implications of local choices to the environment (Hester 51) Adding the visual assessment survey to comprehensive planning can enhance the decision-making process on land-use issues.

Usually, comprehensive planning is done by professionals. These professionals, through research and public meetings, try to determine local values. Most local governments need professional assistance in developing guidelines, but residents should participate as well, to ensure that design professionals are not simply codifying their own tastes (Stokes 162). However, the professionals and local residents will have differences because professionals perceive the landscape differently than do local residents. Professionals examine the issues, but do not share the acute emotional attachment that residents may have for certain elements of the local landscape. People will often value even rather common instances of nature. At the same time, certain rare, non-natural elements may not be valued at all (Kaplan 246). Professionals may express concern over the rare while ignoring what may appear to be the mundane, even though the mundane may be very important to the security of the local residents (Kaplan 246).

The fact remains that professionals, often without realizing it, do not see the world the way others see it. While professionals are invaluable resources when used appropriately, they are a dubious source of "objective" judgment as to what people care about in the landscape (Kaplan 246). Professionals are not always objective either.

They may have a different and possibly "more informed" view or perhaps they are just more aware due to their background of education and experience.

Public involvement is an opportunity to not only inform the public, but to solicit public response regarding the public's needs, values and evaluations of issues and proposed solutions (Creighton 4). Professionals should work with the public by providing necessary information to help them make informed judgements. The more information the public has, the better the chances are for successful decisions. No relevant groups or individuals should be excluded from being invited to become involved in the process (Stokes 5).

Not all elements of the planning process have to be complicated efforts conducted by expensive professionals. One of the most remarkable aspects of a citizens' effort happened in Honeoye Falls, New York, where the effort was almost 100 percent voluntary, with little advice from outside consultants that the town could not afford to hire. Perhaps that is why committee members relied so heavily upon simple observation and plain common sense. Led by an able local organizer, John McNall, residents began to take "the critical second look" at everything in their village, and articulated what they liked and did not like. They then examined their ordinances and the nontraditional development of recent decades. Naturally, they found a strong causal relationship: zoning really was a type of genetic code shaping all new growth. The trouble was that the current "gene pool," as expressed in the regulations, lacked many of the traits necessary for new growth to retain any "family resemblance" to the village core districts and neighborhoods. In other words, the place was on its way to losing its identity because its regulations had much more in common with generic suburbia than with the village itself (Arendt 26).

A less technical (than those previously developed) visual assessment survey method can provide local residents another opportunity to express their local values. Visual assessment surveys can fill a void in the planning process and perhaps build a bridge between professionals and the residents to create a sense of participation and ownership on the part of residents and a better foundation for professionals when making recommendations for future decisions.

Professional planners have for decades relied upon surveys to better understand what types of change local residents would prefer to see in their towns, given the fact that changes are inevitable. This has often taken the form of a written survey. In other instances, an "open community forum" or "sounding board" technique has been used, where residents are encouraged to share their hopes and fears about the future of their town. Both of these are healthy and often productive exercises, with the best results usually achieved when the atmosphere is casual and the responses candid and interactive. Perhaps there is a common sense way to combine what we now seem to know about scenic characteristics with local judgments into a defensible relatively easy to apply method for ascertaining scenic quality in agricultural landscapes (Schauman 40).

The visual assessment survey provides the pictures, or vision, of what a community wants and what it does not want on its land. The images are not arbitrary; they are not unreasonable. They are a product of a public process. They represent public consensus from people who have experienced the place. They provide insight and reasoned responses. They represent a consensus vision. It is planning and design by democracy. Now there must be the will to translate this vision into a

comprehensive plan and ordinances. It is only through implementation that the public's vision will become the new reality (Arendt 29).

Although survey techniques can provide valuable information unobtainable in any other manner, they provide no solid basis for evaluating the one element of new development of concern to all: its physical appearance, and the way it relates to the existing town and surrounding landscape (Arendt 29). It is sometimes difficult for the people to perceive the future visually. They cannot visualize what that new development will look like in the wooded area west of town.

To address this imbalance in survey information, Professor Anton Nelessen of Rutgers University employs a visual preference survey "as a technique to facilitate public involvement in the process of determining the desired spatial and visual features of both current and future development within a community" (Arendt 28). For example, comparisons between various types of developments, cluster housing vs. traditional subdivision design can be compared by using photographs of various types of housing developments.

An assessment approach based on the preferences of the general public is more practical and appropriate. The concept of 'landscape quality' requires human perceptual and judgmental processes, preferably those of the general public. The conceptual basis for the public preference approach to landscape quality assessment views design or the assessment processes as a function of the characteristics of the environment, the actions of designers and managers, plus the needs, demands, and perceptions of the observing public and/or users. This is in contrast to the descriptive approach which assumes that aesthetics are inherent in the landscape so that a description of landscape characteristics can presumably provide an evaluation of its

aesthetic quality. Descriptive approaches typically rely on the standards of trained experts and do not assess the perceptions of the public (Smardon 168).

The public involvement approach explicitly incorporates the viewpoint of the public. More importantly, it provides a double feedback where management actions produce changes in the environment which elicit perceptions and judgments of the landscape from the observing public. These perceptions and judgments then constitute feedback to the manager regarding the landscape, thus affecting future designs and plans. In addition, there is a similar feedback system where the actions of the public produce certain environmental effects which then influence the managers' perceptions of environmental capacities and constraints. The managers then reach the public through education and communication regarding the environmental consequences of users' behavior, thereby affecting their behavior. This model, which explicitly and overtly incorporates the actions, perceptions, and judgments of the public in the design or assessment process, forms the conceptual basis for the landscape quality assessment methods (Smardon 168).

Of course the pubic involvement method described above is the ideal. In reality, if often does not reach the planner's or resident's ideal. Planners do not always do what the public desires and in turn the public does not always change its behavior through information provided by planners.

There are several reasons why a conceptual link is needed between users and observers of the landscape, designers and managers, and the landscape itself. First, understanding the interaction between people and environments is important, regardless of whether immediate applications or requirements exist. As with other

areas of basic science, the study of this interaction may yield useful information or lead to unexpected gains in more utilitarian applications (Smardon 169).

A second reason is legal. There may be instances where use of a more complex method of visual assessment surveys will better serve the needs of the public. The National Environmental Policy Act of 1969 and other legislation addressing specific actions or agencies require the evaluation of the aesthetic effects of most land management decisions. Evaluation of scenic consequences is often done by landscape professionals, but the addition of user-based landscape quality assessment may be advisable. Legal challenges of management decisions are commonplace. Systematic assessment of the public's perception of scenic effects of landscape management and design potentially enables more informed planning decisions, provides important communication and educational messages for the public as well as professionals, and may help to circumvent costly legal battles (Smardon 169).

Public lands are held in trust for all citizens and should be managed with their best interests in mind. User-based assessment of perceived landscape quality is therefore one way of obtaining public opinions that may be used in the formation of policy or in environmental planning decisions. Participation of the public has been mandated legally; for the responsible planner it is also an ethical mandate (Smardon 169).

Private land should also be included in the above statements by Smardon. They may not be used by the general public, but are viewed by the people who use transportation corridors and the public lands bordered by private land. It may not be deemed a legal mandate, but it should be an ethical mandate to include all lands. By including all lands, public involvement can focus on working with rather than for people,

of getting the public involved in the planning process. It is another way for people to work together to improve their situation (Smardon 169).

There are also times when the public goes beyond just residents and information about people's values should be sought outside of the local public. In areas where tourism is a factor affecting economic development and growth, users, both residents and visitors, should be surveyed. Visitors opinions should also be included during comprehensive planning in regions where tourism is a factor in economic development to determine their values about the natural and cultural resources of the place they are visiting.

A study by Peterson in 1974 indicated that wilderness managers in the Boundary Waters Canoe Area had attitudes, perceptions and motivations that were quite different from those of users of the area. Craik has argued that there is reason for expecting that environmental decision makers will differ from their clientele in perception and evaluation of the environment. There may even be instances when local values will differ from visitors values. When this happens, those making the decisions will have to weigh both sides and determine what is best for the environment, residents and users (Buhyoff 256).

Natural resource planners and managers seek to maintain a flow of benefits to people while protecting the resource. In recent years, scenic amenity values have emerged as an important element in this stream of benefits, particularly in public sector resource management. Concurrent with the growth of awareness of the visual aspects of resource management has come the need for greater involvement in decision-making by those for whom the service is provided. Public involvement is especially important in areas where the benefits are as subjective as they are in visual

environmental management. In response to a felt need for tools with which to assess landscape preferences of the public, numerous research efforts have been undertaken. Therefore, if there is a desire to "plan for people", some information gathering must take place. For example, who are the people who make up the relevant client groups, since the opinions of potential users are missed in a survey of current visitors to the area? To what extent should public planners and managers be in a responsive rather than a leadership position in matters where they have been trained (Buhyoff et al 255)?

> People who can not choose together can not act together. That is common sense, but the process of making a difficult choice requires a particular kind of conversation among people. This involves sitting down and carefully and deliberately identifying the various options and weighing the advantages and disadvantages of each, without settling on a single option before taking action, as well as consulting people whom we trust and respect. Public talk is about making decisions and arriving at tangible results and outcomes. It is an exercise in moving from opinion to judgment. Legitimate public opinion results from the interactions that citizens have with one another. Working to shape opinions collectively renders them legitimate, genuine and authentic. It is only when people engage one another--face to face, in what can be a terrible struggle--that they find out what they are going to do, because the crucible of that exchange, the blending of different perspectives, eventually causes us to see things differently (Matthews 402,403).

Clearly, design criteria must in some way embody the values and norms of the prospective users or the design outcome will be at best less than satisfactory. Mismatches between initial values and ultimate plans/designs usually result from the void between designer/planner and the user. The human environment systems are mutually dependent and have mutual effects upon one another. Variance exists between those who make policies concerning the environment, and those who actually live within the environmental context for which the policy is being made (Kopka 732, 733).

Methods

Literature review for this research focused primarily on the work of landscape architect Sally Schauman. Schauman developed a method for local residents to assess the scenic value of the area where they live which combined existing tools with their local judgment. The framework for her methods was developed by the Soil Conservation Service, now the National Resource Conservation Service (NRCS). NRCS believed it was possible to develop a scenic assessment process usable by local citizens, with some technical guidance (Schauman 3). NRCS completed a study where they could apply a visual assessment process in Whatcom County, Washington. The hypotheses for this study was that local residents could consistently identify and rate certain scenic factors (that professionals have suggested, account for visual quality) that a local group could choose from among the array of professionally-derived factors those factors which make common visual sense within the setting; the chosen scenic factors could be combined by laypersons into an equation for evaluating, inventorying and mapping scenic quality; and the resultant mapped quality areas would correlate with local scenic preferences (Schauman 4).

The NRCS method is based on a conceptual framework developed earlier by Schauman and another researcher, Pfender, in 1982. It is based on four assumptions: most of the scenic value of an American countryside can be attributed to one or a combination of seven indicators (described on the following page), local preferences will change the choice, mixture and weighting of these indicators; professionals should become facilitators guiding local groups to judge scenic landscape values rather than becoming judges of local scenic values; and research methods and personal

computers could be used in common sense ways for scenic planning in rural areas (Schauman 5)

Most of the visual assessment processes done prior to Schauman's 1986 research did not focus on agricultural landscapes, but on wild lands and forested landscapes. There was little research done on American agricultural landscapes (Schauman 5).

When examining preferences in wild lands or forest landscapes, people often relate to the amount of human activity and its compatibility with those natural surroundings. The countryside is a meld of human-modified and natural landscapes (Schauman 5). Very little land in the Iowa landscape can be classified as natural. The Iowa landscape is very cultural. Agriculture and transportation systems have not left much of the land untouched. Efforts are made to preserve and conserve areas along rivers and streams, forested lands, and open spaces. Schauman addresses the difficulty of segregating what people perceive as "natural" and the difficulties in assessing scenic value in the countryside (Schauman 5).

Schauman used a framework with seven indicators to measure the three common characteristics of landscape: space, pattern and content. Six of the indicators were derived from a combination of landscape architectural practice, preference research, and common sense. A seventh indicator, "meaning", was used based on the belief that array alone does not explain human reactions to scenery (Schauman 7). The research for this process was based on these seven indicators. The indicators were the following (Schauman 7):

1) Character--visual congruency in terms of form, line, color, texture and scale.
2) Uniqueness--special landscape conditions from "rare" to "ordinary".

3) Fragility--the capacity of the landscape to visually absorb human changes.

4) Fitness--landscape evidence of human care or dereliction.

5) Structure--the spatial characteristics of the landscape from "completely open" to "closed".

6) Information--the amount of data provided by the landscape from "none" to "chaotic".

7) Meaning—a cultural interpretation of landscape value either by individuals or as a community—history, symbolism and education.

Schauman developed four hypotheses for the Whatcom County study. The first two were that local preferences could be used to select, calibrate and weigh indicators. She explains this by saying that because there is no research evidence that any feature of scenic quality is more important than any other in agricultural settings, one indicator may be more important than another in a local situation. The third hypothesis, combining scenic factors, relates to the first two in that if scenic factors could be identified and chosen by local residents, then it is logical to believe that these factors could be arranged in an equation that makes local visual sense (Schauman 7). Schauman's final hypothesis was that professionals must adhere to an old-fashioned, but timely notion that planners work best when they facilitate rather than dictate (Schauman 8). If research methods, specifically preference testing, were used in common sense ways with local citizens to investigate scenery, would the resultant process identify actual visual quality in rural areas (Schauman 8)? Schauman's study consisted of five major steps (Schauman 9):

1) Dividing the study area into landscape units;

2) Selecting and calibrating indicators;

3) Developing a scenic rating system;

4) Mapping the study area according to the rating system; and

5) Testing the mapped areas as to public preference.

The results of Schauman's study seem to support her four hypotheses indicating that professionally-derived scenic indicators can be modified and calibrated to fit local situations in a public participatory process where the professional guides rather than directs results (Schauman 19). She goes on to say that it seems possible to incorporate photo preference testing into planning for many purposes (Schauman 19). The participants in the process felt as though this was truly a product of local values and that the methods used were not exotic or cumbersome (Schauman 19).

Carolyn A. Adams, Gary Wells, and the NRCS also completed a research project on assessing scenic quality in countryside landscapes. Their research and techniques were developed in November of 1985 and, like Schauman, focused on the need to assist local communities, groups or other interested citizens in understanding the importance of their surrounding countryside (Adams et al. 1). They produced a field guide that "is a technical and planning tool to help decision-makers recognize a wide range of landscape values in the countryside" (Adams et al. 1).

The first step was to develop a general description of countryside. Countryside is a geographic concept tied to the physical landscape (Adams et al. 1985 1). The following definition by Sally Schauman was developed for general use and understanding of their field guide: "Countryside is a recognizable landscape unit containing a predominance of agricultural patterns and activities and defined by both cultural interpretations and the physical setting (Adams et al. 1)." There are many terms used loosely to refer to the countryside such as rural, agrarian, agricultural,

vernacular and pastoral, but they often bring nostalgic images to mind and are not individually helpful when studying how people react to the countryside (Adams et al. 1).

The next step for this group of researchers was to get organized. They decided on the following five steps which would build the foundation for the assessment process (Adams et al. 3):

1) Understanding the assessment process
2) Understanding "people" roles
3) Setting the study objectives
4) Determining the assessment product
5) Developing a plan of work.

By dividing the public into groups of leaders, doers, decision makers and the general public, Adams and Wells have developed a team that should include a broad representation of the public. There should be leaders, doers and decision makers in all sectors of the public, whether they are local leaders, farmers, environmentalists or interested citizens who may not belong to any group or organization, but possess skills useful in developing and administering a visual assessment survey. There should be no racial, economic or social barriers when choosing members of the public to become part of the visual assessment survey team.

Adams and Wells defined the assessment process as a participatory way to evaluate the quality of countryside landscape by focusing on the agricultural land use patterns and activities occurring on the land. This consisted of three parts (Adams et al. 3):

1) A hierarchical classification which categorizes the landscape into areas (called landscape units) according to the visual appearances of land use

and the influences of other visual elements such as vegetation and landform.

2) Selecting a set of evaluation indicators which are characteristics used to judge the visual quality of the landscape units.
3) An assessment method which is the final assemblage of information where the landscape units are evaluated for scenic quality as revealed by the indicators.

If the people conducting the assessment process understand the components of this first step it will lead to a plan of work that will include all the necessary steps to meet the study objectives (Adams et al. 3).

Adams, Wells, and the NRCS felt that public participation and the public's input was very important to assessing the countryside's visual value. Because of this, they wanted to make sure they understood the people's role. They considered the following (Adams et al. 5):

1) Who are the community leaders?
2) Who should be the project advisors?
3) Who are the "doers"?
4) Who will actually do the work?
5) Who are the decision makers
6) Who is the public?.

By dividing the residents into groups and asking residents to fill roles for developing and administering visual assessment surveys, it may appear they do not think the United States is a pluralistic society. It is my assessment that they do understand the diversity of skills in our society and that using those diverse skills by

assigning people to fill roles for completing various steps of the method provides opportunities for people to share those skills and enhance the visual assessment survey as well as the comprehensive planning process.

After everyone understands the assessment process, the next step were the following (Adams et al. 5):

1) Setting the study objectives.
2) Determining the final product.
3) Formally investigate the study.

Identifying landscape units was the next phase of the assessment process. This was done in a descriptive manner so that project participants could agree on what was in the landscape and ultimately, set up a framework to compare the relative values of units. The landscape unit identification step had several component parts:

1) Understanding Landscape Units. A landscape unit is an area or zone of land uses or classifiers (Adams et al. 9).
2) Classifiers are basic visual subdivisions of agricultural activity or land use that appear distinctive. (Adams et al. 10).
3) Visual modifiers are prominent landscape elements which appear along with, but not necessarily adjacent to, a classifier subdivision and substantially contribute to one's visual understanding of the countryside (Adams et al. 13).
4) Delineating Unit boundaries which are defined as: Areas where the combination of classifiers and modifiers shift or change enough to create a visually different countryside pattern; i.e., the transition zone between two countryside patterns (Adams et al. 16).

5) Using Cognitive Mapping (Individually) This involves using local residents to help map and identify the public's perception of landscape units and to locate areas of particular cultural significance. The team may ask the participants questions like the following:

    a) Please describe your county to someone who is unfamiliar with it.

    b) Please describe what your county looks like and what kind of activities take place there.

    c) Please describe which parts of your county are usually similar. Describe in what ways they look alike.

Participants recorded their responses directly onto a copy of the base map (Adams et al 19). They combined the participants survey maps onto a single large size map so that all information could be transferred as accurately as possible. This aid in identifying landscape units and in some cases could be the sole method to identify those landscape units. The final step was to compile the information from the use of classifiers, modifiers, and cognitive mapping to identify the final landscape units. A field check may be needed to verify or adjust boundaries where needed (Adams et al. 20).

After the landscape was objectively classified and divided into visual/cultural management units, these were set aside and the study group began to determine qualitative values through the use of evaluation indicators.

Adams et al. used the same indicators as Sally Schauman in her 1986 Whatcom County assessment process. However, Adams et al. provided clearer

definitions for each of the indicators. The indicators and their definitions were the following:

- Character - a measure of the harmony (which is a value) of the various elements in a landscape, judged by size, shape, line, color and texture. Various levels of character can be defined by determining how well the elements work together to make a memorable scene (Adams et al. 24, 25).
- Uniqueness - is a measure of the relative quantity and distribution of landscape elements or conditions. It must incorporate comparisons (Adams et al. 25).
- Fragility - is a measure of a landscape's ability to absorb change (additions or deletions) without diminishing the visual quality of either the existing landscape or of the additions. It deals specifically with change, and will not be appropriate for all visual assessments (Adams et al. 26).
- Fitness - is a measure of the degree that the landscape exhibits tending or care by the people who occupy it. It not only evaluates the landscape, but to some degree, the people who care for it (Adams et al. 27).
- Structure - is a measure of the spatial qualities of the landscape. The landscape can be looked at as an outdoor room where vegetation, hills or structures form the walls (defined spaces) (Adams et al. 27).
- Information - Information is a measure of message quantity and quality provided by a landscape to human observers, or simply stated, how interesting or dull landscapes appear (Adams et al. 29).

There is no magic 'right or wrong' number of indicators; but these researchers' field experience, to date, has shown that three indicators are relatively understandable

and have produced reasonable results: character, structure, information (Adams et al. 29).

The next step is to determine the range of landscape evaluation indicators that exist in the study area and to determine people's preferences for identified levels of indicators. One method is to conduct preference surveys using photoboards. Preference surveys are conducted to find out what type of scenery people prefer. It is a tool to learn more about people's values and attitudes (Adams et al. 30).

Evaluation indicators that represent local landscape dimensions are selected, photographed, and placed on a photoboard. People are then asked to rate photographs according to selected criteria and mark their opinion on a survey form (Adams et al. 30).

Photographing the scenes to represent the indicator levels was very time consuming. The more familiar the study group is with the landscape, the simpler this task becomes. It is best to photograph many, many, scenes on one field visit, rather than take many trips to shoot a few selected photos. It is also more efficient to assign at least two persons to complete this item so that a dialogue and more comprehensive understanding of the scene occurs. The photography team should keep records about camera type, lens used, film type, photographs, frame number, date, time, direction, weather or sky conditions, indicator level, location, purpose, and description (Adams et al. 30).

Adams suggested using black and white film to take photographs. Though some visual assessment literature contends that seasonal conditions can affect public preference, field testing to date has not supported this contention. Rather, preference testing of the same scenes, one set in color and one in black and white, produces

nearly identical results. Also, the use of black and white photographs significantly reduces the effect of sky or weather on preference results. Sky tones photographed with black and white film are more consistent than those taken with color film. Color shifts in the blue tones of the sky can be dramatic with color film even if all the scenes are photographed on the same day with the same sky conditions (Adams et al. 32).

After using both color and black and white, neither was preferred over the other by the team members. We did use color slides for the Story County survey which, in my opinion, showed some of the scenes more clearly. When showing photographs of rip rap or of wetland vegetation that has been flattened by snow it appeared that the color scenes were easier to view and determine the detailed content of the photograph. If further research is conducted on this method, my recommendation would be to use color, unless it was during the fall season where foliage turning from green to fall colors may influence preference ratings.

Adams indicates that indicators can be represented by individual photographs. Structure, however, is a spatial concept and is best represented by pairs of photographs. This more closely represents a person's natural angle of vision and thus, will more accurately represent the indicator (Adams et al. 32).

Adams recommends that landscape scenes be photographed with the ground plane near the middle of the scene and at eye level. This will most closely represent the normal viewing angle (Adams et al. 32). Each photo should represent only a single level of an indicator. The photographer should avoid mixing close-up shots with long-distance shots when testing indicators. Also, human-made objects which evoke emotions should be generally omitted from photos. The prime objective is to isolate dimensions of an indicator; therefore, the purest shots are most desirable.

Large prints (4" x 6" or 5" x 7") of the photos were helpful. The larger size photographs were much easier to view than the standard photographs when pasted on a photoboard (Adams et al. 34). Adams suggests that each photoboard should contain no more than twelve photographs. Larger numbers would take too long to survey and would tend to be too confusing for participants. Use a separate photoboard for each indicator. Field experience has shown that four samples of each indicator level is a practical number. The photos should be arranged randomly and on a neutral colored board such as grey or brown. A transparent overlay showing the indicator and level of indicator can be helpful in the analysis stage (Adams et al. 34).

After the materials are prepared for the survey, the next step is to choose the site for conducting the survey. The study team should decide whose opinions will be most valuable considering the purpose of the assessment. After this is done, a site(s) where the audience is most likely to be should be selected (Adams et al. 36).

Now the study team was ready to conduct the survey. Adams suggests that the photoboard should be propped up or placed on an easel to reduce glare on the photos and allow the greatest number of participants to take the survey simultaneously. Each participant should be provided a clipboard and pencil with the survey form attached. Adams also says that an assessment team should try to survey at least 50 persons per indicator board. She stated that social scientists do not agree on the needed number of surveys needed for a given population; however, results of the survey will be more statistically significant if there are a greater number of participants.

Dillman, who *wrote Mail and Telephone Surveys - The Total Design Method*, states that a sample cannot be considered representative of a population unless all members of that population have an equal chance of being included in the sample

(Dillman, 41). He goes on to state that it is almost impossible to gain access to a completely representative sample of the general public...some segments of the population are over-represented; others are under-represented. Knowing this, the researcher must be concerned that those omitted do not differ significantly from those actually selected, or that the over-represented portion does not skew the sample data (Dillman, 44).

There is seldom a definite answer about how large a sample should be for any given study. There are many ways to increase the reliability of survey estimates and increasing sample size is one of them. It should be noted here, that there are three approaches to deciding on sample size that are inadequate. Specifying a fraction of the population to be included in the sample is never the right way to decide on a sample size, a particular sample size is the usual or typical approach to studying a population also is virtually always the wrong answer, and finally, it is very rare that calculating a desired confidence interval for one variable for an entire population is the best way to decide how big a sample should be (Fowler 35).

The purpose of this thesis research was to develop a process for non-professionals or professionals not trained in conducting surveys or technical equipment needed for complex surveys. It focuses on developing a process that local people can do with little or no outside assistance. Because of this, those conducting the visual assessment survey will most likely be familiar with the sample population and should make a concerted effort to have an equal representation as possible of the various groups, agencies, organizations and of residents from all geographic areas. A larger sample size may not give a higher confidence interval, but it does provide an

opportunity to increase public involvement and develop greater awareness during the comprehensive planning process.

After the survey was completed, Adams' team began compiling the data. They assigned a numerical value to each preference answer. Simple statistical methods were applied to the data. They used a computer with basic social science statistical software to save time, but they contended that it was not absolutely necessary.

Several conclusions were drawn from displayed statistical data results. The photographs which received the highest average score were the most preferred scenes and those which received the lowest were the least preferred (Adams et al 37). It could be interesting to compare what the study team thought would be the most preferred scenes, based on their research, compared to what the public actually preferred (Adams et al 37).

After the public's attitudes were analyzed, the next step was to develop the assessment criteria. So far in the process, indicators were used and analyzed as separate, independent dimensions. But for indicators to be useful in determining "quality", it was necessary to sort out their interrelationship in the landscape (Adams et al 39). For example, if the public preferred medium structure over high structure and high character over low character the public would prefer a scene with medium structure and high character. Likewise, the least scenic category would include high structure and low character. All indicators used in the assessment survey needed to be sorted out. After this was completed the scenes needed to be assigned to a quality category with vernacular descriptors. Adams used the following categories and descriptors:

1) Most Scenic - "Beautiful"

2) Scenic - "Pleasing", "Nice"

3) Average - "okay", "Nothing Special"

4) Below Average - "Unattractive", "Eyesore".

The vernacular descriptors are used to simply provide commonplace terminology for defining the categories (Adams et al 39).

The last step in the visual assessment process was to map the visual quality. The mapping could be tailored to fit project objectives, budgets, documentation needs and personal abilities. There were many methods of mapping. The overlay method, grid cells, use of symbols, lines and patterns or a combination of two or more of these can be used to map visual quality (Adams et al. 46).

Sally Schauman contributed a chapter in the book, *Foundations for Visual Project Analysis*. In this chapter, she speaks about the reason for doing a countryside landscape visual assessment. She states that, " the federal government admonishes us to save prime farmland, advertisers use quaint scenes of farm life to sell their products, and interest groups form national coalitions to conserve countryside life and land." She goes on to say that thousands of people have moved to rural areas in the past decade and this population shift has resulted in growth and change in areas which had changed only slightly in the past. Rural subdivisions, shopping centers, bypass roads, single family dwellings on small acreages, and other developments are changing landscapes that where only crops were grown in previous years. Clearly, the countryside is a landscape that is always changing and will look differently in the future (Schauman 104).

Schauman also points out in this chapter the importance of the local residents' participation in dealing with visual change in countryside areas. The main purpose of a

visual assessment is not the professional planner's evaluation, but the local residents' increased awareness of their visual environment and its probable future appearance (Schauman 104). "Even when people live great distances apart, they may consider themselves neighbors within a community. People in small towns expect to be involved" (Schauman 104). She quotes Penning-Rowsell as saying that, "We need to identify what people believe are the facets of landscape value, rather than what the researcher, the historian, the landscape architect and planner think they believe." The only time Schauman feels that professionals should conduct the visual assessment is when the results will be used in litigation. "In these cases, the visual assessment resembles research and the measurement methods must be reliable, valid and generalizable" (Schauman 104).

Even if the results may not be used in litigation, there are other times when a visual assessment survey should be done by professionals. If there is a known potential for controversy over the results of the survey due to a particular local issue, residents may find it beneficial to have a third party develop and administer the survey. That third party may be professionals with expertise in developing and administering visual assessment surveys, landscape architecture or planning. Involving professionals in developing and administering the survey may prevent residents from contesting the results if those results appear to favor a particular group or issue.

A need for professional assistance may also occur if the landscape in the region includes very unique features. An example of this is the Loess Hills located in western Iowa. During the development of the Loess Hills Scenic Byway, Mimi Askew (National Resource Conservation Service) spoke with residents and found that many did not recognize the value of the landscape where they lived. It was not until professionals

began researching and developing the Loess Hills Scenic Byway that they were made aware of the uniqueness of the region known as the Loess Hills. Without the expertise of professionals in this instance, planning efforts may not have focused as much on preserving and enhancing the delicate natural environment of the Loess Hills (Golden Hills Resource Conservation & Development 27).

Additional Research and Literature Review

After completion of the visual assessment process in southern Story County, other methods of visual assessment studies were researched. Looking at other methods helped determine the effectiveness of the process used in Story County. If a visual assessment survey process is used again for planning in Story County, adjustments can be made based on additional research.

One of the visual assessment processes examined after the Story County visual assessment survey was the Visual Impact Assessment (VIA) process developed by Craig Allan Churchward. He is a Landscape Architect with the Environmental Studies Unit of the Minnesota Department of Transportation (Mn/Dot).

This study involved the visual impacts of roads and highways. This did not deal directly with planning for the rural countryside, but the VIA method could be applied to local planning practices to protect the visual quality of rural areas.

Mn/Dot was required to do a visual impact study on their projects because the National Environmental Policy Act (NEPA) required that visual quality impacts be evaluated for all federally funded projects. The VIA was intended to assist Mn/Dot in anticipating and mitigating the adverse visual impacts caused by highway projects. It was also intended to assist Mn/Dot in recognizing and utilizing the opportunities the

proposed project would have on improving the existing visual quality of the project area (Churchward 51).

The VIA process developed by Mn/Dot had six steps and each step answers a fundamental question. The steps and questions were the following:

1) Identify the affected visual resources.

   "What visual resources of the natural, cultural, or highway environments would be affected by the proposed project?"

2) Identify the affected population of neighbors and travelers.

   "What do people like and dislike about the existing scene?"

3) Define the existing visual quality of the project area as perceived by the affected population.

   "What do people like and dislike about the existing scene?"

4) Analysis of the impacts the proposed project would have on the visual quality of the existing scene.

   "What will people like and dislike about the changes the proposed project would cause to the existing scene?"

5) Summary of the visual impacts for each alternative. Identify visual benefits afforded by the proposed project.

   "What visually, are the relative advantages and disadvantages between alternatives?"

6) Determine measures which would mitigate adverse visual impacts.

   "How can adverse visual impacts be avoided, minimized, or compensated". And, it also answers the question, "How can beneficial

impacts, the opportunities for improving the visual quality of the existing scene, be assured inclusion in the proposed project?"

There are similarities between the VIA used by Mn/DOT and the studies by Schauman and Adams et al. All three look at the visual, natural and cultural resources of the environment. However, Mn/Dot focused on the transportation corridor environment. Mn/Dot did not use the indicators that Schauman developed, but instead looked at the objects which compose the environment and how they were affected if they were in the viewshed of the proposed highway. Mn/Dot defined natural resources as being composed of the topography, surficial geology, flowing or placid water, vegetation, wildlife, and skylight both during the day and at night (Churchward 52). The visual resources of the cultural environment were composed of a community's public, commercial, and residential architecture, open spaces, monuments, and civic art (Churchward 52).

The visual resources of the highway environment were composed of the highway's geometrics, pavement, structures, signs, lights, buildings, rest areas, and commemorative markers. They were documented, dependent on the complexity of the project, using either an inventory, a map, or photographs. An inventory was defined as a list of those visual resources which are in the viewshed, a map illustrates the location of the affected visual resources, and photographs identify visual resources and their setting (Churchward 52).

The second step employed by Mn/Dot answered the question, "Whose views would be affected by the proposed project?" The affected population are the people whose views would be affected by the highway project. The two major groups were neighbors and travelers. Neighbors were defined as people who own or use the

property within the viewshed of the proposed highway and travelers were people who use the highway. Neighbors were divided into viewer-groups based on land-use and were divided into residential, commercial, industrial, retail, agricultural, recreational, and civic neighbors. Travelers were divided into viewer-groups based on their purpose for traveling and may be divided into commuting, hauling, touring, and exercising travelers.

In this step, the documentation was done using maps, population and traffic statistics, and inventories of viewer-groups, based respectively on their land-use or on their purpose for traveling (Churchward 53). The third step of the VIA process defines "existing visual quality." The visual quality of the existing scene was documented, dependent on the complexity of the project, using a descriptive narrative, an annotated map, photographs, or a statistical survey. The narrative was a description of the existing visual quality as seen by the affected population. It included the perspective of both neighbors and travelers. The narrative description of visual quality expressed the emotional quality of the existing scene. It illustratively described, not just the objects, but the composition of the objects which form the scene. Churchward stated that it was important that the alternatives be viewed or imagined in different times of the day and during different seasons. Supplementing the narrative with photographs was useful (Churchward 57).

Summarizing the narrative as an annotated map was effective. Adding descriptions, photographs, or drawings to the map helped clarify the visual issues associated with the project (Churchward 57).

A statistical survey of viewers can also be used in very complex or controversial projects. A survey can determine what the affected population considers important visual resources or flagrant eyesores in the project area (Churchward 58). There was

no mention in this step of what specifically the survey would cover or how it would be administered.

Larry Canter wrote *Environmental Impact Assessment* as a text book for courses dealing with the Environmental Impact Assessment process and as a reference book for practitioners responding to legislation controlling environmental issues. Part of the environmental assessment process in his book dealt with the prediction and assessment of visual impacts with the meaning typically related to visual quality and potential project impacts. Canter defined aesthetics as that which is concerned with the characteristics of objects and of human perception which determines if the object is pleasing or displeasing to the senses. He defined an aesthetic resource as those natural and cultural features of the environment which elicit one or more sensory reactions and evaluations by the observer (Canter 467). And he defined visual character as a landscape that is formed by the order of the patterns composing it and their interrelationships. The elements of the patterns are the form, line, color and texture of the landscape's visual resources. Form refers to the perceived aggregation of elements in which there is a consciousness of the distinction and relation of a whole to its parts. Line refers to a thin mark, such as a boundary or border, a division between conditions. Color elements of visual patters are the hue, or color, and value, lightness or darkness, of the light reflected or emitted by an object. And finally, texture refers to the parts of any material, such as wood, metal, and so forth, its structure and composition (Canter 468). Much like Schauman, Canter examined the landscape for its components, or parts, to evaluate and determine visual value.

Canter (470) used a process developed by Richard Smardon, which is also very similar to that used by MnDOT. He too has six steps for a visual impact assessment:

1) Identification of types of visual impacts from proposed project/activity;
2) Preparation of description of existing visual resources for the study area;
3) Procurement of relevant laws, regulations, or criteria related to impacts and /or conditions;
4) Prediction of the impacts of the proposed project/activity on existing visual resources;
5) Assessment of the significance of the predicted impacts; and
6) Identification and incorporation of mitigation measures (470).

Canter (467) claimed that these six steps would suffice for the majority of aesthetic-impact prediction and assessment studies. This six-step method is more detailed than MnDot's. The process developed by Schauman is also evident in these steps. For example, the second step involved describing the existing visual resource by conducting an inventory of visual resources to establish community values, policies, and priorities related to existing visual resources. In Smardon's suggested visual-inventory process, he includes public participation using the following steps (Canter, 474):

1) Notify the public of the proposed inventory process and its purpose.
2) Conduct a survey of local resident/viewer perceptions by identifying positive visual attractions and visual detractions, or misfits in the landscape.
3) Conduct public meetings to inform residents of the public's perceptions and values regarding its visual resources.
4) Adopt the municipal visual resource inventory

5) Formalize community visual standards through creation of sign ordinances, architectural board of review's adopted standards, or other appropriate techniques.

Canter did not describe survey methods that might be used in a visual assessment for an environmental impact statement.

In *Foundations For Visual Project Analysis*, Joanne Vining and Joseph J. Stevens discuss surveys and questionnaires in the visual assessment process. They state, "Surveys and questionnaires have been a very popular means of assessing the opinions, attitudes, and perceptions of the general public and can be very useful for probing complex management options or issues." They examined Dillman's methods and state that "Sampling is a critical issue for users of surveys and questionnaires. It must be determined in advance which people will be the appropriate respondents." They felt that those people who will receive direct benefits from a project affecting visual resources should be included and of course, as Dillman disucusses, the participants need to be identified in advance and should have an equal chance of being included in the survey sample (Vining et al 170).

Vining and Stevens state that the goal of perceptual preference assessment is to measure environmental quality judgments more directly. They used photographs and slides and asked subjects to indicate their preference for each landscape. They noted that one critical issue in visual assessment surveys is the manner in which the landscape is presented. Because the environment is represented with photographs or slides (the color slide is most commonly used) the landscape representations should be restricted to a reasonable range of environments and they should be sampled well. The validity of the landscape representation in slides or photographs generally

increases the number used to represent the region's environment. Vining and Stevens also stated that the color slide is most commonly used in visual assessment surveys and that several studies have examined the validity of the color slide representation of landscapes and it appears that color slides provide good examples for landscapes, especially if they are relatively homogeneous (Vining et al 175).

Another issue that Vining and Stevens addressed was the measurement of the response. They stated that the measurement method should be guided by the complexity and statistical treatment needed to interpret the measurement (Vining et al 178). It can be something as simple as ranking landscape scenes and using the mean scores. In contrast, it could involve more complex methods requiring more detailed knowledge of visual preference research and methods such as those developed for agencies like the U.S. Corps of Engineers and U.S. Forest Service. They conclude that the method used in a visual assessment survey should be carefully designed and executed. People developing the survey, as well as participants, should be critical of the quality of the information and the criteria established to obtain the information. They concluded that the participation of the observing public can contribute to wiser resource use and more effective and intelligent planning of future landscapes.

Visual Assessment

Public involvement and landscape assessment and their importance in the planning process directed my attention to the value of the visual assessment survey. Many landscape architects, sociologists, psychologists, foresters, and conservationists have discussed or written about assessing the visual environment to determine how it impacts people's lives. The research and literature review for this thesis focused on

landscape assessments that directly related to land use planning and visual assessment surveys.

A statement by Sally Schauman (48) from her paper *The Countryside Visual Resource* that "the American countryside is a major national asset" best explains the focus of this thesis. She best expressed concerns about the future of the countryside when each day people mine, drill, divide, flood, pave or plant some part of the countryside landscape. She states that before people take any of these actions, they should first understand the countryside's resources. But, as evidenced by the current countryside landscape, seldom do people fully understand. So, before people choose to change the countryside, they should consider the scenic values of the countryside landscape. *Unfortunately, people almost never do* (Schauman 48).

Schauman (48) defines visual resources as "the consistently definable appearance of the landscape and may be described by the measurable visual elements; topography, water, vegetation, sky and structures and the patterns of interaction among these elements." Visual resource quality is an evaluation that follows the objective definition of the resource. An evaluation of visual quality is not a simple matter for it occurs within the arena of perception (Schauman 48)

Schauman (51) goes on to say that "the American countryside changes rapidly before our eyes, but beyond our consciousness and attention. There are many factors causing this change; urbanization in suburbs, transportation systems, industry and mining, and agricultural production and technology." It is important to assess the landscape and the changes imposed on it by varying factors of development which in their potential for changing the visual resource in terms of extent, magnitude and degree of permanence. For example, residential structures may be built on only a

small area, but they greatly change the visual and physical impacts over a large area. Mining activities may make major changes for a short time on vast areas, but may be returned to their original appearance (Schauman 51).

Carolyn A. Adams and Gary Wells, also with the NRCS, agree with Schauman that people overlook the complex value systems and personal attachments associated with agricultural landscapes (Adams et al 1). David Pitt wrote on methods of landscape assessment research and planning where he defines the assessment of visual resource values in landscape planning as an investigation of a fundamental relationship between an observer and a landscape being observed. He goes on to say that Litton suggested that people's aesthetic responses to the landscape are produced by the interaction of three factors occurs (Pitt et al 227):

- Characteristics of the observer - viewing or use expectations;
- Characteristics of the landscape being observed; and
- Physical and behavioral context in which the observation.

John B. Jackson, in his essay titled *Historic American Landscape*, asked how people could identify the main visual resources of the landscape, how to create them as well as how to preserve them and know that they have served a good purpose. He went on to say that there is equal concern about the role society plays in this kind of judgment. The history of the American landscape is in large measure the history of the social forces that have controlled it. A human-made landscape does not evolve according to some natural law; it changes as our social philosophy changes, sometimes very radically. Yet, Jackson says, every landscape, no matter how it has been determined, has a capacity for beauty and for giving joy. It is at a time like the present, when we are becoming aware of the changes taking place (Zube 4).

It is the impact of these changes that Ian Laurie (102) writes of in his essay *Assessment Factors in Visual Evaluation* when he states that the need for visual quality landscape assessment in the planning profession is commonly accepted as a product of the increased pressure for change in the landscape and of a growing need to protect the scenic qualities of the landscape as a resource in limited supply. Laurie states in this 1975 essay that assessments have risen in the last ten years from the needs of planners to solve new and more urgent problems affecting the landscape. Those assessments can be either purely philosophic and aesthetic; or they may be quantitative and use applied measurement techniques in the fields of geography, planning, environmental psychology, economics, and landscape design (Zube, et al 102).

He defines landscape assessment as "the comparative relationships between two or more landscapes in terms of assessments of visual quality"; in this context, assessments are the "process of recording visual quality through an observer's aesthetic appreciation of intrinsic visual qualities or characteristics within the landscape (Zube 102, 103).

The passage of the National Environmental Policy Act of 1969 also brought an increasing pressure upon planners to fully consider aesthetics in their decision-making processes. NEPA stated that all federally related activities consider the environment in terms of "aesthetically pleasing surrounding...(one) which supports diversity and variety of individual choice" (Public Law 91-190) (Buhyoff 255). Buhyoff states concern in this article over the term "visual environment". He states it is misleading because, although it is the environment that we see, its assessment involves human perceptions. These, in turn, involve all of our sensory experiences plus other cognitive factors such as past

learning experiences, emotions, attitudes, and expectations. These perceptions vary between and within individuals. Planners in the past have used their own judgments in making decisions about people's preferences in the landscape based upon instinctive criteria—viewers prefer variety in landscape; unusual landforms enhance preference; difficulty of access and ability to absorb people without damage to the environment are prerequisites for people's preferences of wilderness landscapes. Other authors, such as Craik in 1970, have argued that there is reason for expecting that environmental decision makers will differ from their clientele in perception and evaluation of the environment (Buhyoff 256).

Buhyoff and Hull, when writing about the reliability of landscape assessments, stated that the assessment of visual quality of natural landscape scenes is growing in productivity and popularity. They argued that individual observers who participated in landscape assessment studies were reliable in their assessments of a landscape's aesthetic quality. That is, their aesthetic judgments did not change with time—they were consistent. The purpose of their study was to examine the long term reliability of individual raters from public panels (Buhyoff et al 68). Their article gives validity to the visual assessment survey process as well as the visual assessment. They conclude that results of group data should be used to make decisions when at all possible and that the data is stable is over a moderate length of time (Buhyoff et al 70).

Laurie substantiates their conclusion when he states that the need for assessment is based on the assumption that aesthetic standards are held and sought after, and that they are an important cultural facet of our society. Whether held by a minority or a majority, and whether articulated or not, is of lesser importance than the

knowledge that aesthetic standards do exist and are beneficial to the individual and through him to society at large (Zube et al 106).

Conclusion

Because people do have aesthetic standards about the landscape and what they value as beauty in the landscape, an assessment by local residents allowing them to manage their landscapes for visual quality appears to be an essential ingredient in the planning process. Among authors represented here, there is great support for local input in the planning process and value in visual assessments of the landscape.

There has been an awakening that the landscape was becoming increasingly ugly and abused, both in rural and urban areas. This awakening was significant because attention was directed to the ugly rather than to the beautiful and satisfying and because primary attention was directed to the impact of humans on the landscape rather that to natural landscapes (Smardon et al 12). The purpose of this research project was to develop a simpler method than that previously used so that even those entities who do not have the resources to hire professionals to conduct visual assessments or visual assessment surveys can determine local visual aesthetic values. By providing a simpler means of assessing the visual environment, those governing the rural countryside can address the "ugly" whether existing or potential and preserve the "beautiful".

CHAPTER THREE. VISUAL ASSESSMENT SURVEY METHODS

This thesis research builds on a project in Iowa State University's Comprehensive Landscape Planning Studio, LA 463 in the Spring of 1995. The studio project was done in cooperation with Les Beck, Story County Planning and Zoning Director. The purpose of the project was to assess residents' values of the landscape, explore various methods for mapping, and determining critical resource areas. Students in the studio were divided into groups to research soils, vegetation, cultural elements, economics, watersheds and streams, visual resources, watershed management, and workshop and interviewing methods.

Dr. Norman Dietrich was the professor for the studio. He invited me, knowing of my interest in planning and visual resources, to participate in the research being conducted by the studio students and perhaps use this information in my graduate research. The students were allowed maximum latitude to explore different value systems and methods. Kirby Hoyt and Rich Olson volunteered to become part of my team and assist me in researching visual resources and how to conduct a visual assessment.

The team began their work by studying the research of Sally Schauman on countryside visual resources and Mimi Askew's work in the Loess Hills. We examined Schaumann's methods for developing and conducting a visual assessment survey. Mimi Askew also visited the studio and gave a presentation on her visual assessment and perception studies for the Loess Hills Scenic Byway. We also examined work done by Carolyn Adams and Gary Wells. All of these individuals conducted their

studies for the U.S. Department of Agriculture's Natural Resources Conservation Service.

Our next step after initial research, was to develop our own goals and objectives for the studio research project. Our goal was the following:

- Develop a visual assessment model.

We had four objectives:

- Conduct visual resource inventory and record information with photography.
- Develop a survey.
- Test the model.
- Increase public awareness of environmental and cultural visual qualities.

To develop a model based on the landscape in all of Story County would be difficult because people living in one part of the county may not have the same landscape features and types as people in another part of the county. The team decided to examine a smaller geographic and political unit to allow for a more manageable and thorough inventory.

Watershed and school district boundaries were selected because people living in these small regions would have common bonds and ties to the landscape. Because my home is in Huxley (a community located in the Ballard Creek Watershed in southern Story County) and Dr. Dietrich was very familiar with the watershed area, the Ballard Creek Watershed was selected for the visual assessment study. The Ballard Creek Watershed was also selected because it had many different landscape types and offered opportunities to experiment with photography and image editing. The Watershed contains Ballard Creek and its tributaries, a forest preserve, trail system, wetlands, wooded areas, croplands, and rural residential lots and subdivisions along

with small rural communities. The Watershed's boundaries are also very similar to the boundaries of the Ballard Community School District, which is named after Ballard Creek. A map of the Ballard Creek Watershed and Ballard Community School District is in Appendix A.

After establishing the location of the study, the next step was to develop a method for evaluating the visual resources of the Ballard Creek Watershed that would require little, if any, outside professional assistance from the Story County planning staff.

Resource Inventory

The first objective involved examining the landscape in the Ballard Creek Watershed and photographing scenes representative of the cultural and natural features. Criteria, based on Schauman's research, were established to determine which scenes to photograph. We used visual assessment methods developed by Sally Schauman and adapted for use in Mimi Askew's Loess Hills research. We also discovered that earlier research by other landscape architects dealt primarily with wildlands and woodland/forest landscapes. The landscape in the Ballard Creek Watershed has been impacted by human activity and there are no areas untouched by humans. However, in discussing our project with other classmates, we decided that people living in rural areas still feel that part of that cultural landscape has "natural" characteristics. Streams and wooded areas are often referred to by locals as "natural". Schauman's research agreed. She (5) stated, "the countryside is a meld of human-modified and natural landscapes, it is more difficult to segregate the factors perceived as "natural" in the countryside. Wild land/forest visual resource research provides

clues, but no real answers and the results of forest wild land visual resource research cannot be directly translated to agricultural landscapes Schauman 5)."

Schauman refers to studies by other landscape architects for terms to describe landscape characteristics. She was not surprised to discover the terms used were space, pattern, and content—terms familiar to and often used by landscape architects (Schauman 6). To measure these three common characteristics, Schauman developed seven indicators. Adams and Wells also used these characteristics and indicators in their work. After re-evaluating our needs, we decided that the method devised by Schauman was too complex for non-professionals or professionals with limited knowledge about visual assessments. However, we felt that some of the indicators Schauman developed were useful in choosing landscape scenes to photograph.

After completing our research, we developed a list of the natural and cultural features of the Ballard Creek Watershed. Askew's research was helpful in developing this list, because her work was also done in Iowa. The following list was developed:

- Roads
- Streams
- Fields
- Trails
- Traditional Farmsteads
- New Cultural Features
- Rustic Cultural Features

For those landscape elements that dealt with spatial features; such as roads, streams, fields and trails, we decided to take three photographs of each element to represent feelings of high enclosure or structure, moderate structure, and openness, or

no structure. For example, we took a picture of a roadway with trees on both sides which would give the motorist a feeling of enclosure as he/she drove down the road. Then we took a photograph of a road with some trees on either side or just one side, and then of a road with no trees on either side--only open fields. Samples of the photographs used in the visual assessment survey are in Appendix B.

It is important to note that because of the class schedule, the photographs were taken in early February. There were no leaves on the trees and the ground cover was brown and low due to the weight of earlier snows. There were no crops growing in the fields; they were barren. The water in the streams was not frozen, but due to snow melt the streams were flowing with moderate amounts of water. The importance of seasons in this process is discussed in the next chapter. It is important to discuss the conditions of the landscape because when examining the structure, or level of enclosure, along roadways, there are times of the year when seasonal crops change the structure. Corn is an abundant crop in Iowa and reaches heights of seven to eight feet. When the road ditches are narrow and the fields are cultivated close to the road, corn crops can create a tunnel feeling for motorists and completely alter the visual structure of a roadway. For our purposes, we felt that in Iowa crops are not visually significant for eight months out of the year and, because crops in fields are rotated, the condition of the visual structure can change from year to year. We did not take into account the effect that crops would have on roadway structure when we took our photographs.

Next we decided whether we were going to use prints or slides and whether they would be black and white or color. Because we had several opportunities to test our research, we decided to prepare both print photographs on boards and slides.

Black and white photography was used for the boards and color was used for the 35mm slides. There was no particular reason for the choices we made. In discussing with Askew during her studio visit the virtues of black and white vs. color, she stated that her research, of other visual assessment survey methods, indicated there was no significant difference, so she used black and white. She did state in her written report that the reason for using black and white was to remove any bias from viewer's responses due to foliage and sky color (Askew 11).

Because we wanted our testing of the scenes in both black and white and color to be consistent, we took both photos at the same time, from the same point, using one camera with black and white film and the other camera with color film. Both were 35mm cameras and had the same capabilities for adjusting light and focus.

All the photographs were taken eye level. Studio team member, Rich Olson, took all the photographs. We did not use a tripod due to time constraints. In order to get photographs of all the elements representing southern Story County, we did photograph some of the elements with structures in them outside the Watershed, but still in the School District. We took three sets of photographs to make sure that we captured the elements we wanted and to insure high quality photographs for the testing.

Image Editing

After the photography sessions were completed and the film developed, Kirby Hoyt used a few of the photographs for image-editing. He used software (*Adobe Photoshop*) developed to alter the images on a photograph by adding or deleting features. Because of the time restrictions of working in a studio setting, the photographs with altered images were not developed well enough to be included in the

testing. However, it was beneficial to see the capabilities of the software and to see altered images of the landscapes we photographed. A list of the equipment and software used for image editing is included in Appendix C.

Survey Development

The team worked together to write a survey instrument that would solicit responses from participants to quantify their visual values of landscape features shown in the photographs. We also were aware that this instrument would be tested by children and needed to be easy to use by people of all ages and abilities. An opening paragraph explained who was conducting the survey, thanked the participants, and briefly explained how to complete the survey. A page was also included that requested demographic information. A copy of the survey form, including demographic questions, is included in Appendix D. It was decided, that for the purposes of this studio, the demographic information portion of the questionnaire would not be used, because it was not relevant to determining a process for conducting a visual assessment survey. We did ask the elementary students to fill out the second sheet containing this information, but it was disregarded when tabulating the results.

The black and white photographs were attached to a black foam core board and each photograph was assigned a number and labeled to coincide with the numbers on the survey form. The slides were numbered and placed in the carousel tray in that order. They were assigned the same numbers as the black and white photographs. This was done to make an easier comparison of results between the two methods.

Testing the Model

With the photography complete and the survey developed and written, the team was ready to test the model. The model was tested at two sites on February 24, 1995. The first test was held at the Ballard Senior High School in Huxley. The participants were in Grades 10 and 11 and students in an English class. We introduced ourselves and briefly explained the purpose of our project and thanked them for participating. Survey instruments were distributed to the group and we explained that they were to indicate their preference for the scene in each slide by circling the number on the survey that corresponded with their preference. We asked if anyone had questions and there were none. We then let the students view all fifteen slides, in sequence, before beginning the actual survey process. We then showed the students each slide again and let them respond by marking on the survey instrument as each slide was shown. The entire survey process took approximately twenty minutes. Following the survey we asked the students if they had any comments. Those comments are discussed in Chapter Four.

We felt that allowing the students to preview the slides before they filled out the survey would give them an opportunity to establish a basis of comparison thereby reducing the potential for confusion. For example, if they rated the first slide with a 5 and then they felt the second slide had a higher preference, they could not give a higher rating. One way to potentially eliminate establishing a preliminary basis of comparison may be by telling the respondents to rate the first slide with a 3, or whatever mid-level rating system is used, and use that first landscape scene as their base point and all following landscape scenes would then receive a higher or lower rating.

Both color slides and black and white prints were tested with Grade Six at Ballard West Elementary School in Slater. This testing was done in two classrooms. Olson and Hoyt conducted the survey using color slides with one group and Magnuson conducted the survey using black and white photographs on the photoboard with the other group. Hoyt and Olson used the same process with their group as we had done with the high school class. Directions were given to the students on how to complete the survey instrument using the photoboards. Because there were three photoboards, so the class was divided into groups of six. The groups rotated between the photoboards as they finished marking their preferences for the photographs on each photoboard. The photoboards were placed on the floor leaning against the wall or furniture. The children gathered around the photoboards on the floor with their survey instruments. They were asked not to discuss what they thought about the photographs and they were very good about quietly observing the photographs and marking their preferences. After they had completed indicating the preferences they were asked to fill out the second page of the survey instrument which asked demographic questions. The process took about twenty minutes in each classroom and there were no difficulties in conducting the survey in either classroom.

Following the testing at both the high school and elementary schools, the studio team tabulated the results. A copy of the tabulation sheet is included in Appendix E.

Testing the Model at the Story County Conservation Center Workshop

Part of the studio research included preparing for and conducting a workshop to present the entire studio's research and findings on critical resource areas in Story County. Our method for a visual assessment survey was also included in the agenda for this workshop.

Steve Lekwa, Story County Conservation Board Director, invited residents he knew from Story County to participate in a Critical Resource Workshop. Fifteen residents attended this workshop. The participants all appeared to have interests in environmental concerns. The survey was conducted in a room with auditorium-type seating and a large viewing screen. The visual assessment survey was conducted after the introductions.

Because this workshop was conducted in May, new photographs of the scenes for this survey were taken on April 14, 1995. We felt that the February scenes may remind people of cold weather rather than scenes that reflected the current weather conditions. The snow was gone and the grass was green; however, there were still no leaves on the trees and the fields had not been cultivated. The day we took these photographs was very windy, making it difficult to hold the camera steady. Participants commented that the scenes in some of the slides were somewhat fuzzy. We also increased the number of slides in this testing from 15 to 20. A copy of this survey instrument is in Appendix F.

After we were introduced, lave a short description of a visual assessment and some background on the testing we had done at the Ballard Community Schools. Participants were then given survey instruments and instructed how to fill them out.

This survey instrument was similar to the one used at the Ballard Community Schools, except that this instrument provided for the additional slides and no demographic information was requested.

Twenty new slides were selected for inclusion instead of the fifteen used at Ballard Community Schools, using the same list of cultural and natural features as for the first set of photographs. As in the first survey, the participants were allowed to preview all of the slides before recording their responses. There appeared to be some confusion regarding how to determine their preferences for the landscape scenes. One participant felt it was difficult to determine how to select a preference, but after two or three slides were shown, participants seemed to grasp the idea and became comfortable with the process.

Scenes for this survey varied slightly from the first survey in the Ballard Community Schools. Because this survey was done later in the semester, the team had time to review what they had done at the Ballard Community Schools and determine how they could improve the process. They decided that more photographs could be used, especially because this group consisted of adults and also because we knew we would have more time. A new list was developed of landscape features for the survey as shown in Table 1.

The tabulation sheets prepared for this survey were the same as used at Ballard Community Schools. There was one tabulation sheet for each slide. The numerical value placed on the scene in the slide by each respondent was multiplied times the number of total responses for that value. That total was then divided by the total number of participants indicating a mean numerical value the group placed on that particular scene. This mean numerical value for each slide allowed the scenes to be

ranked. This is the same process as used in the first testing at the Ballard Community Schools. Dr. Dietrich suggested we use this method because it was easy to tabulate and would result in a ranking based on the responses of the participants.

The results were tabulated while the workshop continued. At the end of the session, the slides were rearranged and shown to the participants in order of preference with least liked being shown first. After the results were shown, the participants provided constructive comments in a workshop evaluation on how the process might be improved.

Table 1 Landscape elements photograph list.

Landscape Element	Characteristics
Streams	1) Stream bank rip rap - trees in background grasses bordering rip rap
	2) Low vegetation - channeled waterway
	3) Moderate vegetation - grasses on both banks trees on one bank, meandering streambed.
Roads	4) Low vegetation - roadside grasses
	5) Moderate vegetation - roadside grasses, some trees
	6) High Vegetation - grasses, trees on both sides, heavily wooded
Trails	7) Low vegetation - grasses only
	8) Moderate vegetation - grasses, some trees
	9) High vegetation - grasses, trees both sides, heavily wooded
Rural Development	10) Rustic - abandoned barn & silo
	11) Traditional farmstead
	12) Contemporary farmstead (high production)
	13) Rural residential - new housing development, non-farm
Fields	14) Cultivated - open, no fencerow vegetation
	15) Cultivated - moderate enclosure, grasses and few trees in fence rows
	16) Cultivated - high enclosure, heavily wooded around field periphery
"Potholes"	17) No vegetation - in cultivated field, visible water
"Wetlands"	18) Vegetation, not cultivated, no visible water

As participants were leaving the workshop, one of them approached me and expressed concerned that if respondents favored wooded landscapes over his farm fields, his fields would be threatened. He said that Iowans like trees because we don't have many and that because most of the landscape consists of corn and bean fields anything with trees in it would rank high and his bare fields would rank low. He went on to explain that although his fields may not be visually pleasing to people living in the survey region, they may be pleasing to farmers because they are their livelihood. His comment was well received and taken into consideration during studio team evaluations of this method.

This workshop concluded the research and testing on the visual assessment survey as part of the studio class. A written report of the entire studio's research and findings was prepared and presented to Les Beck and the Story County Planning and Zoning Commission in June, 1995.

Indian Creek Visual Assessment Survey

After the Story County Workshop presentation, Les Beck approached Dr. Dietrich and me to ask if the same process could be used on Indian Creek from Highway 30 in central Story County to Highway 210 in southern Story County. He suggested that this would be a good opportunity for the County Auditor's office to test new voting machines by placing voting machines in the libraries at Nevada and Story City (both located in Story County) and give library patrons an opportunity to participate in a visual assessment survey. He felt that it would also provide beneficial information to Steve Lekwa and himself about the possibility of locating a hiking trail along Indian Creek.

A meeting was arranged for the three of us so we could discuss their goals for the visual assessment survey, the location of the study area and needed photographs, and how to conduct the survey at the libraries.

During our meeting, we determined that the primary goal of the process was to test the ease of using the new voting machines and that the survey should be developed for that purpose. It was also decided that the banks along Indian Creek had potential for trail development and the results of the survey may prove beneficial in determining the feasibility of trail development along this stream corridor.

My assignment from this meeting was to develop a list of landscape characteristics to be photographed for the survey (Table 2). After this list was developed, another meeting was scheduled with Les Beck to review the list. He agreed, but expressed concern that all of these landscape characteristics might not exist. We agreed that as many as possible would be located and photographed for the survey. Steve Lekwa then mapped out where these landscape characteristics might be located in the study area.

For this survey, a panoramic camera was used instead of a 35mm camera. It was suggested by Dr. Dietrich that this camera may capture a better view and include a more complete photograph of landscape characteristics than the normal size photograph. Color slide film was used for the photographs.

Taking the photographs was a challenge. Most of the locations mapped by Steve Lekwa were views from roads and bridges. These were located several feet above the stream and the views were looking down at the stream instead of views that hikers or bicyclists would see. However, the vegetation was very tall and had holes and objects like barbed wire fence which made it unsafe to take pictures at that level. So,

for safety's sake, the photographs were taken from bridges unless it was safe to walk down the embankments near the bridges (which was not usually the case). Photographs were taken of the Indian Creek stream corridor beginning at Highway 30 and continuing south to Highway 210 using a 24-exposure roll of color slide film.

Table 2. Landscape Characteristics of Indian Creek

Landscape Characteristic	Description
Meandering Narrow Stream	1) Tree canopy on both banks 2) Tree canopy on one bank 3) No tree canopy on either bank 4) One or both banks denuded by grazing 5) Cultivated land to stream bank (one or both banks)
Channeled or Straight Narrow Stream	6) Tree canopy on both banks 7) Tree canopy on one bank 8) No tree canopy on either bank 9) One or both banks denuded by grazing 10) Cultivated land to stream bank (one or both banks)
Meandering Wide Stream	11) Tree canopy on both banks 12) Tree canopy on one bank 13) No tree canopy on either bank 14) One or both banks denuded by grazing 15) Cultivated land to stream bank (one or both banks)
Channeled or Straight Wide Stream	16) Tree canopy on both banks 17) Tree canopy on one bank 18) No tree canopy on either bank 19) One or both banks denuded by grazing 20) Cultivated land to stream bank (one or both banks)

down the embankments near the bridges (which was not usually the case). Photographs were taken of the Indian Creek stream corridor beginning at Highway 30 and continuing south to Highway 210 using a 24-exposure roll of color slide film.

After the film was developed, eight photographs were chosen to use for the survey. Instructions were written and both the photographs and instructions were reviewed and approved by Les Beck. The photographs were photocopied in color, trimmed and placed on a black backing. The photographs and instruction sheet were then placed in clear plastic sheets and bound in a folder. One set was placed at the Nevada library and the other at Story City. Black and white copies of the photographs used in the survey are included in Appendix G. I never had the opportunity to see the voting machines or how the folders were displayed. The voting machines and folders were in the libraries for a period of two weeks. There was a notice in each community's local newspaper that this survey was being conducted using the voting machines. There was no way to monitor who filled out the surveys or if a participant completed the survey more than once using the voting machines.

Les Beck developed the survey instrument that respondents used in the voting machines. A copy of the of the survey instrument used with the voting machines is included in Exhibit H.

After this survey was completed, Les Beck contacted me by telephone and said that he felt the goal of testing the voting machines was successful. He said that the County Auditor felt this offered people an opportunity to become familiar with the voting machines. He also felt that the results would be beneficial in future studies on trail development along Indian Creek.

CHAPTER FOUR. RESULTS AND DISCUSSION

The primary purpose of developing a visual assessment survey model for this research was not to determine what landscape scenes people in southern Story County preferred, but rather to develop and test a method for conducting a visual assessment survey that was practical for use in rural areas with limited human and financial resources.

The results of the surveys conducted in the pilot test at Ballard Community Schools, the Story County Workshop and the public libraries for Indian Creek were not analyzed to determine specifically which landscapes people in Story County preferred. Rather, they were analyzed to determine if the information could be useful in the comprehensive planning process for rural areas. After pilot testing the method at Ballard Community Schools and the Story County Workshop, the studio team and instructor Dr. Dietrich felt this was a good start.

Pilot Test

Results

The Ballard Community School pilot survey results indicating landscape preferences were not tabulated and ranked. Instead, the studio team evaluated our methods and discussed what improvements or changes we might make in preparing the survey for the Story County Workshop.

After the pilot survey was administered, we asked the high school students for comments. Some of the students said they liked trails with trees, but the slides showing trails had a lot of signs in them which had a negative effect on their preferences.

It should also be noted that both the elementary and high school students were very cooperative and took their role in pilot testing our methods very seriously. They appeared to study the photographs and slides very intently and marked their preference with deliberation.

After the elementary students completed the visual assessment survey, we asked them for comments or suggestions. Some of the students commented that they did not like looking at vegetation in the winter and, as mentioned earlier, they did not like the photographs with signs because they cluttered the views (even though the view was of a wooded trail). The elementary and high school students did not comment on the survey instrument.

Discussion

Two different methods were used in the pilot testing: color slides and black and white photographs mounted on black foam core. The same survey instrument was used for both methods. Use of the slides for administering the survey was easier. Everyone viewed one image at a time and the next slide was not shown until everyone had sufficient time to mark their preference rank on the survey instrument. The photoboard was awkward in group settings. Only three or four people at a time could view the photographs mounted on the photoboards. After a group completed filling out their preference ranking on the survey instrument the group exchanged places with another group to view the next set of photographs. Some of the children exchanged ideas on where they thought the location of the scene was in the photograph. This seemed to distract others in the group trying to concentrate on viewing the photographs and fill out the survey instrument. The children were reminded to be as quiet as possible, but they were excited about participating in our research and it was difficult for

them. However, as stated earlier, they took the pilot test very seriously and seemed to give their best effort.

Because of the observations made in the photoboard testing, the studio team decided to use only slides in the next testing. Photoboards would probably work best in a setting similar to the one used by Mimi Askew (in developing the route location for Loess Hills Scenic Byway). Askew used photoboards at county fairs, a regional rodeo, an art fair, an antique show, various amphitheater performances and a weekend display set up by a historical society. In these cases, people could come at their leisure, view the photographs on the photoboards and fill out the survey instrument (Askew 10). Slides worked well for our studio team in the setting where the respondents were gathered together for the specific purpose of testing the method and participating in a workshop. This type of setting would be similar to a public meeting organized as part of a comprehensive planning process.

Story County Workshop

Results

After the survey was administered at the Story County Workshop, the survey results were tabulated and ranked (Table 3). After the other workshop exercises and reports had concluded, the slides were again shown to the respondents in the order that they ranked them. Only one slide (the one with concrete rip-rap on the stream bank) received a ranking higher than was expected by the studio team. The studio team asked respondents why they indicated a higher preference for that photograph. They said that rip-rap may not be aesthetically pleasing, but it indicated an attempt to control stream bank erosion and they felt that was important. This is a good example of elements in a photograph that may elicit a response that might not be what planners

expect. The photograph of rip-rap on a stream bank is included in Appendix B as Photograph No. 8 in Story County Workshop survey.

The results of the survey are shown in Table 3. Mean ratings were rounded to the nearest tenth. In some cases, two or three photographs received the same mean rating. The photographs with the highest rating were of streams with woody vegetation, rustic cultural features (old barn and windmill) and a pothole with wetland vegetation.

Table 3 Survey Results from Story County Workshop. (Photograph numbers correspond with photograph numbers in Appendix B).

Preference	Photograph Number	Mean Rating
Most Liked	17	4.9
	3	4.9
	7	4.6
	20	4.6
	5	4.2
	1	4.1
	14	3.9
	19	3.9
	12	3.9
	15	3.47
	16	3.4
	8	3.3
	13	2.7
	18	2.7
	2	2.7
	6	2.7
	11	2.6
	9	2.6
	10	2.3
Least Liked	4	2

Photographs receiving the lowest rating included a road and trail with little vegetation, a modern farmstead, and new rural residential development.

The participants in the Story County Workshop were asked for general comments and suggestions after the survey was administered. They stated that the

purpose for their participation in the visual assessment was not clearly explained. They felt the slides were shown out of context and it was difficult to give a preference without knowing what was in the surrounding landscape of the scene being shown. They also said that they understood they were a biased focus group (not representative of all County residents) because of their common interest and concern about planning and environmental issues.

Discussion

Due to comments from students in the pilot test, when new photographs were taken for the Story County Workshop, the studio team was careful to not include elements that would distract respondents from the scene they really wanted them to view and rate. However, the studio team felt that if the purpose of the survey is to assess visual resources, elements such as signs and utility lines should be included. Those features in the landscape should not always be excluded simply because it may disturb the respondents. Those features (along with many other features that may not be aesthetically pleasing to many people) are very much a part of the rural landscape and should be evaluated along with meandering woodland streams and tree-lined trails that the respondents ranked high in the pilot test and this workshop.

This group could not be considered representative of Story County's population because of their strong interest in environmental issues. In a typical setting, there should be a more representative group of individuals with diverse interests, such as farmers, subdivision developers, local officials, youth and so on.

Demographic data was not included in this survey instrument. Dr. Dietrich again felt that it was unnecessary because our emphasis was developing a method. He also knew that this was a select group and was not a representative sample of Story

County, so demographic characteristics from this group would not be useful to the results.

If this were being conducted as part of a comprehensive plan, demographic information would be very important to the results of the survey. The demographic data could be used to determine if particular groups (age, occupation, length of residency, land ownership, affiliation with organizations, income or other information) had different preferences from the entire sample or from other groups. The survey could also be given to special interest groups, or clusters, such as farmers, developers or organizations affiliated with environmental issues. A cluster analysis could determine the values of groups and compare those to other groups. A cluster's values of visual resources could also aid in land-use decisions to determine if there may be potential conflicts with a group or between groups. For example, if a developer wanted to purchase a tract of wooded land for rural residential development and an environmental group wanted to preserve the wooded area and the visual resources associated with the area, planners would become aware of the conflict from the survey results. This would provide an opportunity to work with both groups to arrive at a workable solution that would allow the developer to build housing, perhaps by using cluster housing, and the environmental group to preserve and enhance the resources, including visual, of the wooded area.

Indian Creek Visual Assessment Survey

Results

The Ballard pilot test and the Story County Workshop provided an effective basis to develop a survey instrument for the Indian Creek trail study. Based on our

previous experiences, it was relatively easy to determine what landscape characteristics needed to be photographed and included in the survey instrument.

Results of the Indian Creek Survey indicated that respondents preferred views with tree and canopy cover on the stream banks and did not prefer views that were more open and had stream banks with little or no vegetation. Results of the Indian Creek Visual Assessment Survey conducted at the public libraries in Story City and Nevada are shown in Tables 4 and 5. Numbers in the tables are frequencies.

Table 4 Story City—Indian Creek Visual Assessment Survey Results

Photograph No.	Preference - Like	Preference - No Preference	Preference - Dislike
1	7	1	1
2	3	3	3
3	7	2	0
4	6	2	0
5	6	2	0
6	7	2	0
7	3	3	3
8	2	2	5

Table 5 Nevada—Indian Creek Visual Assessment Survey Results

Photograph No.	Preference - Like	Preference - No Preference	Preference - Dislike
1	35	19	9
2	30	16	16
3	35	16	11
4	37	17	9
5	39	11	11
6	45	11	4
7	29	22	11
8	28	19	13

Discussion

The method used to administer this survey worked very well; however, it asked for limited demographic information which made it difficult to determine if there was a representative population sample. There were also no measures in place to prevent an individual from completing the survey more than once.

Using a voting machine ballot for the survey instrument had its limitations. The number of choices for indicating the level of preference, or rank, was limited to only three. In contrast, there were five choices for preference in the Ballard pilot test and Story County Workshop. There was also a limit to the number of photographs because only one page could be used. Les Beck added the demographic questions concerning age and gender as part of testing this method on voting machines. He also added questions regarding use of the voting machines by respondents because the goal for conducting the Indian Creek survey was to provide an opportunity for citizens to become more familiar with these voting machines. Again, the ballots limited not only the number of photographs, but the number of questions that could be used to obtain demographic characteristics of the respondents.

Respondents indicated that the voting machines were easy to use. In Story City, 100% of the respondents indicated that the voting machines were easy to use and in Nevada, 78% said they were easy to use, 6% said they were not easy to use and 16% did not answer this question. Most respondents said that even though the machines were easy to use, the space limitations of the survey instrument for photographs and demographic questions, along with fact that there was no way to control the population sample, suggests that this is not an appropriate tool in the comprehensive planning process.

CHAPTER FIVE. CONCLUSIONS AND RECOMMENDATIONS

Developing and administering visual assessment surveys for use in rural regions in a classroom setting had its limitations, but it was a beneficial exercise for determining its potential for planners and residents. It also offered an opportunity to evaluate existing visual assessment survey methods and assess what improvements could be made for the visual assessment surveys used in comprehensive planning or for other land-use decisions.

This chapter includes conclusions and recommendations about methods for preparing and administering a visual assessment survey:

- Understanding the local landscape;
- Photography methods and preparing the survey instrument;
- Selecting the population sample;
- Analysis of results;
- Application of results; and
- Uses for visual assessment surveys.

Understanding the Local Landscape

Conclusions

Having an inadequate knowledge about the landscape and landscape elements may perhaps be the biggest obstacle for professionals and non-professionals in developing a visual assessment survey. Taking an inventory of landscape characteristics and elements should be the first step after determining the goals. The inventory process is a good review for those preparing the survey. A thorough

knowledge of the region's landscape would be helpful in choosing landscape characteristics to photograph.

When developing a list of characteristics and choosing locations for taking photographs, those involved in this part of the process need to be aware of their own values and not interject them in the survey. This is especially true if those preparing the preparing the survey are residents. They would have biases simply because of their familiarity with the region and may interject those while determining which landscape scenes and features to photograph.

Recommendations

Because of my previous knowledge of the Ballard Creek Watershed, choosing landscape characteristics and locations to photograph them eliminated the need to take an inventory. This saved the studio team considerable time. However, a concern was expressed by other members of the studio team that there may be bias in the landscape scenes chosen to photograph because of my previous familiarity with the local landscape. Because of this team members, Hoyt and Olson were given every opportunity to offer suggestions and photograph scenes they thought should be part of survey. Preparing the survey should be a team effort. More input from various sources, such as planning officials, residents, land owners and so, during the preparation of the survey should decrease chances for bias. There is always the risk that a particular type of landscape scene or feature could be a target for or against protection and land use regulation.

Another issue for those preparing the survey is that photographs could be taken in such a way that detracts or attracts attention to certain features. An example of this would be a photograph of a meandering stream with extreme erosion along its banks

that also contains a rustic windmill in the background. Respondents may rank this high because of the cultural feature. The severe erosion and lack of vegetation along the stream bank may go unnoticed due to the feelings nostalgia created by the windmill. It is important to have a complete list of what landscape characteristics should be photographed and to capture only these characteristics in the photographs, unless it is otherwise impossible to do so.

Photography Methods and Preparing the Survey Instrument

Conclusions

Because Story County has a landscape that is diverse enough to include several different landscape characteristics, it was it simpler to select and photograph those characteristics. If a region does not have many different landscape characteristics to make comparisons, it would require traveling to different locations to photograph various characteristics to use in a survey.

The photography itself can be done with any good 35mm camera. The 35mm panoramic camera does increase the size of the view and captures more of the landscape scene; however, it is not enough of a difference to warrant saying that this is preferred over the views we photographed with the 35mm cameras. We did not test whether participants in the surveys preferred viewing the panoramic photographs (3-1/2 x 10 inch) or the standard 35mm photographs (3-1/2 x 5 or 4 x 6 inch).

The survey instrument prepared for the pilot test and the Story County Workshop was easy for respondents to use. There were no negative comments about the survey instrument. Some of the photographs were difficult for respondents to see because they were not clear or not in focus, but the quality did not prevent them from viewing the photograph and rating the landscape.

Recommendations

The people developing the survey should be very cautious and take care in photographing landscape characteristics outside the study area. For example, to photograph a large lake for use in a visual assessment survey for a region that could not economically or environmentally support a lake would not be practical. Or taking photographs of landscape characteristics in a topography that is very hilly for use in a region that is relatively flat would not represent what could feasibly be developed to visually enhance the region where the survey is being conducted. Again, a thorough knowledge of the region's landscape characteristics will help avoid taking inappropriate photographs for the survey.

If photographs are used, they should be mounted on foam core board or some other type of material that can be propped up against a wall or placed on an easel. Each photograph should be clearly numbered on the board so it is easy to complete the written survey instrument. If slides are used, facilitators should remind respondents of the slide they are viewing with the corresponding number on the survey instrument. Instead of slides, photographs could mounted and numbered on 8-1/2 x 11 sheets of paper and respondents could each have their own set, like a deck of cards, in which they would place them in the order of preference and then indicate that order on a survey instrument. If the public involvement does not involve a public meeting, survey instruments and the photograph "deck of cards" could be mailed to the sample population.

Whichever way the photographed landscape scenes are presented, every effort should be made to have high quality photographs. We did not use a tripod on the day we photographed landscape scenes for the Story County Workshop. It was very windy

that day, making it difficult to hold the camera still. Using a tripod probably would have produced higher quality photographs.

As stated in Chapter Three. Methods, we did not include questions on demographic information in the survey instruments. If this survey were being conducted as part of a comprehensive planning process, it would be beneficial to have information about each respondent's residence (for example, if it is urban or rural), how long they have lived there, age, gender, occupation, and so on. Demographic information can assist in determining why certain landscape characteristics are more favorable or if the respondent sample is not representative of the region's population. For example, when the method was tested at the Story County Workshop, most of the participants indicated a strong interest in environmental issues. They were invited to the Workshop by Steve Lekwa, Story County Conservation Director. He knew these people from their involvement in groups or activities focusing on environmental issues in Story County. Demographic information would show whether the participants are a representative sample.

Selecting the Population Sample

Conclusions

As described in the previous section, selecting respondents who are representative of the population is an important element in this process. Having a diverse group of participants in age, gender, income, occupation and location of residency is important when using the results to justify decisions in land use issues. If the respondents are not a representative sample, the validity of the results can be questioned or challenged.

Recommendations

Choosing a population sample can be difficult for this type of survey because people have to be present to participate, unless the survey is conducted using the method in the Indian Creek survey. Several ways to notify residents about meetings and workshops include notices in local newspapers, announcements on posters placed at local businesses, or postcards mailed to all registered voters. Local groups and organizations can also be asked to help spread the word at their regular meetings. Another method would be administering the survey by mail. Photographs and a survey instrument could be mailed to randomly chosen residents. Lists for mailing surveys can be obtained through companies offering that service, using telephone books, voter registration lists, driver's license lists and so on. There is no way to guarantee a representative sample, but every effort should be made to see that everyone has an equal chance to participate. Regardless of actual participation, demographic information about respondents should be considered in analysis and reported as part of the survey results.

Analysis of Results

Conclusions

Because of the focus on developing and testing the visual assessment survey, the analysis of the survey results is the weakest area in the development and testing of the models for this research project. Results of the survey were never emphasized in the research. Survey results were summarized using the formula on the Tabulation Sheets for the Story County Workshop. It was easy to calculate mean ratings and rank order the scenes for this small group. These results were shown only to the

participants in the Story County Conservation Workshop and included in the final report prepared for the Story County Conservation Board staff and Planning and Zoning staff.

The mean rating tabulation formula for this model was very easy to calculate and use to put scenes in rank order. It is a model where nothing more than a standard calculator is needed to calculate frequencies. The information could also be entered into a statistics software package such as *SPSS, SAS or MINITAB,* the software could be used to produce findings of statistical significance, although this model does not require use of statistical software to compute frequencies and rank order the respondents preferences.

Recommendations

Because the Story County Workshop involved only 15 respondents, it was easy to tabulate and rank the results without software. If there would have been several hundred respondents (or more), it would take more time to count the responses for each photograph. In this case, the data would have to be entered manually into a statistical software package so there would be really no practical difference in the amount of time the manual tabulation sheets take over a computer program. After the data is entered into a computer software program, software commands and functions do the calculations. Using the tabulation sheets requires doing the math with calculators and entering the results on the sheets by hand. However, this requires only common math skills which can be done by most people.

Application of Results

Conclusions

After the results of the respondents' preferences are tabulated and ranked, the information can be used with other information gathered during the comprehensive

planning process. Information from exercises and discussions in other surveys, public meetings and workshops, along with the visual preferences determined by respondents in the visual assessment survey can be the foundation for establishing residents' values.

Recommendations

These values can then be used to set goals to guide land use decisions, especially those concerning preservation of the rural landscape. Caution should be exercised when using the results of the visual assessment survey for establishing regulation and policy for land use. If respondents indicate they prefer landscapes with woodlands, policy makers should not immediately decide to turn fields into forests. Instead, the focus of preservation and enhancement efforts should go to preserving the existing woodlands that contributes to the visually pleasing landscape and where conditions permit, additional trees can be planted to produce more landscapes with tree cover.

There is a familiar saying, "Beauty is in the eye of the beholder." Some respondents may look at a photograph of a landscape and indicate a higher preference for what they perceive as natural beauty, while others may see beauty in the economic value of the land or beauty in the fact it has been in the family for generations. Because the judgment used for determining visual preference of landscapes is in the eye of the beholder, this process should be only one of several parts of the planning process used to discover the value that resident's place on their region's landscape.

Visual Assessment Survey Model for Comprehensive Planning

Conclusion

The Ballard Community School and Story County Workshop visual assessment survey models can be adopted for use in the comprehensive planning process. The team members for those models did not involve the public in the development process. Residents should be included in developing and administering the visual assessment survey when developing a comprehensive plan.

Recommendations

A possible model to increase public involvement when developing and implementing a visual assessment is as follows:

- Planner and facilitator for comprehensive plan should identify potential candidates for committee to develop survey. These candidates should be selected for their leadership skills, knowledge about the region and ability to work with others. Other considerations could be those who have photography skills and equipment and special interests in the planning process.
- Committee members should be selected and formally organized.
- Committee should develop goals for the visual assessment survey. They should ask, "Why are we doing this?" and "How can we use the results?" "What type of survey instrument will be used?"
- Committee should work with the local planner and determine the region to be included in the visual assessment survey.
- Committee members should travel the countryside and identify the landscape elements in the region.

- Committee members should determine how they will choose their population sample.
- Plans should be developed to photograph landscape elements to be included in the visual assessment survey.
- Arrangements should be made for photography equipment.
- A survey instrument should be prepared that corresponds with photographs.
- Committee members should discuss how to administer the survey.
- Final survey preparations should be made by the committee followed by administering the survey.
- Survey results should be tabulated.
- Committee members should analyze the results and include those results in the comprehensive plan.

This is a general plan of action for developing and administering a visual assessment survey. Every situation needs special consideration. Unique landscapes, development pressures or concerns of a particular group or organization may require additional steps to address those issues. These issues should be addressed when developing the goals for the visual assessment survey.

Uses for Visual Assessment Surveys

Conclusions

The goal for this research was to develop a visual assessment survey model for Story County that offered a basic method for developing and administering a visual assessment survey. It was important that the method could be used by planners and local residents who have some level of knowledge and understanding of ecological system in the landscape. This method was not intended for those planning processes

that required a higher level of documentation and analysis to meet NEPA requirements, such as the construction of federal highways or other types of federally funded projects. Those requirements need to have a visual assessment that quantifies visual resources through a detailed and documented process that could be tested in the courts. Several of these have been developed by various agencies, such as the U.S. Corps of Engineers and the U.S. Forest Service. Landscape architects and planners in private practice have also developed various visual assessment methods.

The visual assessment survey developed for this model should be used primarily for the following:

- Enhancing the planning process in rural areas--this model focuses on the needs of rural areas with limited human and financial resources so that planners and residents of rural regions and districts can have the benefit of additional public input;
- Providing residents another opportunity to voice their values as part of the planning process and include visual resources in land use decisions;
- Learning more about the local landscape; and
- Applying local values to the vision of the region.

The method developed from this research would work well as part of a comprehensive planning process. There can be other methods of administering the survey, such as placing the photographs on cards and having participants place the cards in order of preference. Facilitators can record the results of each respondent, along with demographic information which can be obtained through an oral interview or by handing the respondent a questionnaire to fill out after rating the photographs on the cards. Because every situation in a planning process is unique, an evaluation of how

to administer the survey should be done so the participants will be comfortable completing the survey and the results can be easily tabulated.

Recommendations

Each time the visual assessment survey is part of a planning process or land-use decision, specific goals should be established by the planners and local residents so the methods for developing the survey instrument and the analysis of the results will focus on those goals. They need to determine exactly what they want from the process and how they will use the survey results.

In the case of the Story County model, the focus was on helping planners in Story County define, locate, and protect critical resources areas. Using a watershed for this study seemed to be quite effective. If the planning process involves an entire county or a large region, the area involved should be divided into smaller units, such as watersheds or political districts. When using smaller landscape regions or units, the population sample should be chosen from that region. This sample will be more familiar with the landscape elements in their "neighborhood" than those in another region of the same county. For example, in Story County, the Ballard Creek Watershed is in the southwestern most part of the County. The people living in this area are not as familiar with the northern or central regions and do not face issues like flood control or hog confinement. However, people in the Ballard Creek Watershed do face increasing development pressures because of their location along two major transportation corridors, Interstate 35 and US Highway 69 between Ames and Des Moines. Use of visual assessment survey in this part of the county should focus more on developing land use regulations that focus on preventing development that threatens agricultural lands, wetlands, and wooded areas. In contrast, a visual assessment survey prepared

for central Story County along the Skunk River near Ames may focus on improving water quality, flood control and recreation opportunities.

By developing goals, through public involvement, at the very beginning of this process, the visual assessment survey provides the necessary information that can guide land use decisions and policy development toward the values determined by residents of the region.

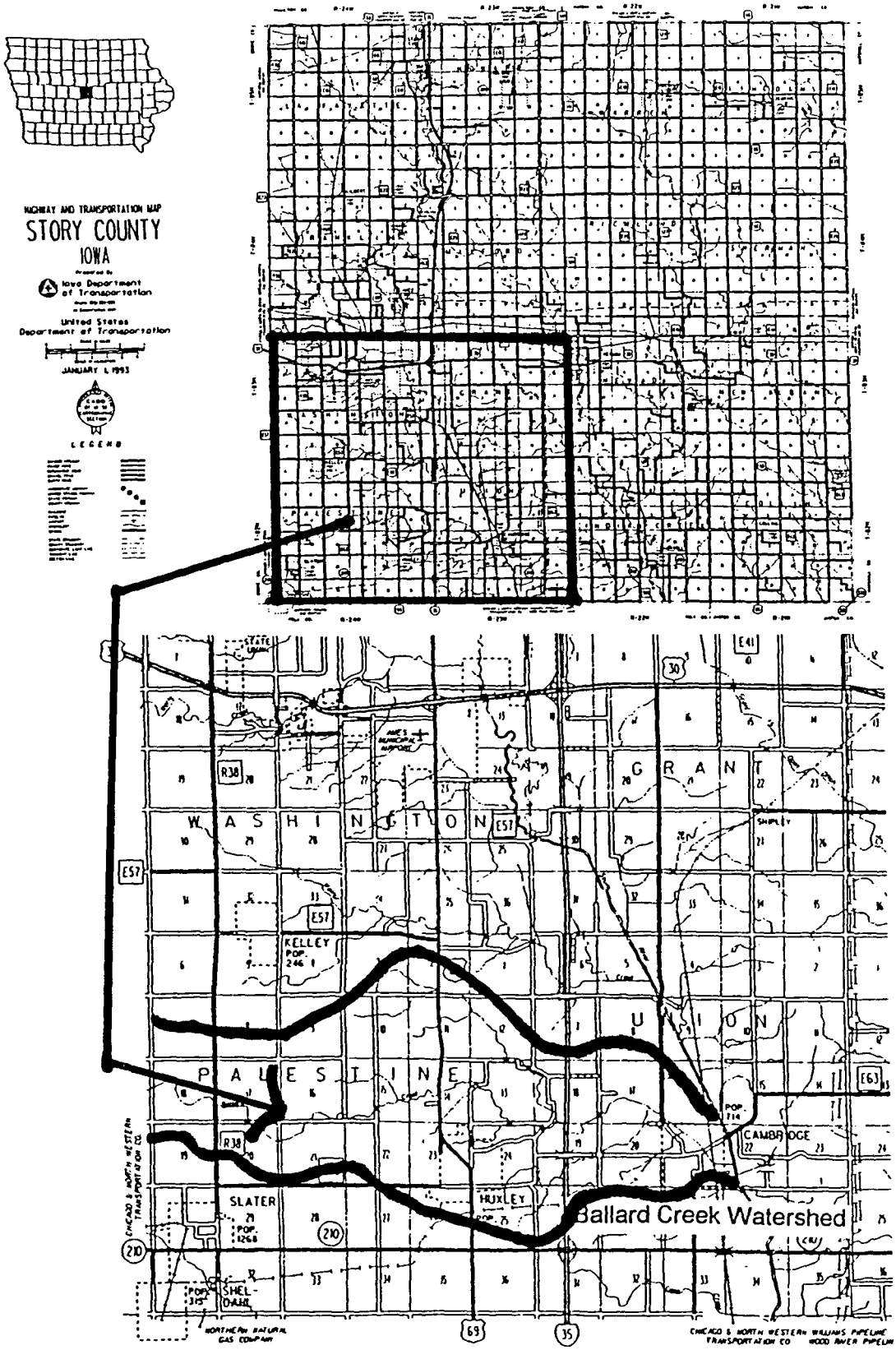
This visual assessment survey method can provide objective information concerning the visual quality of landscapes and the visual impacts of land use activities (Feimer 28). The decision-makers ability to make the right choices about developing and utilizing, or retaining and protecting landscapes depends a great deal on the public's reaction to scenic beauty. A visual assessment survey can ensure that those values are included in rural planning (Shafer 237).

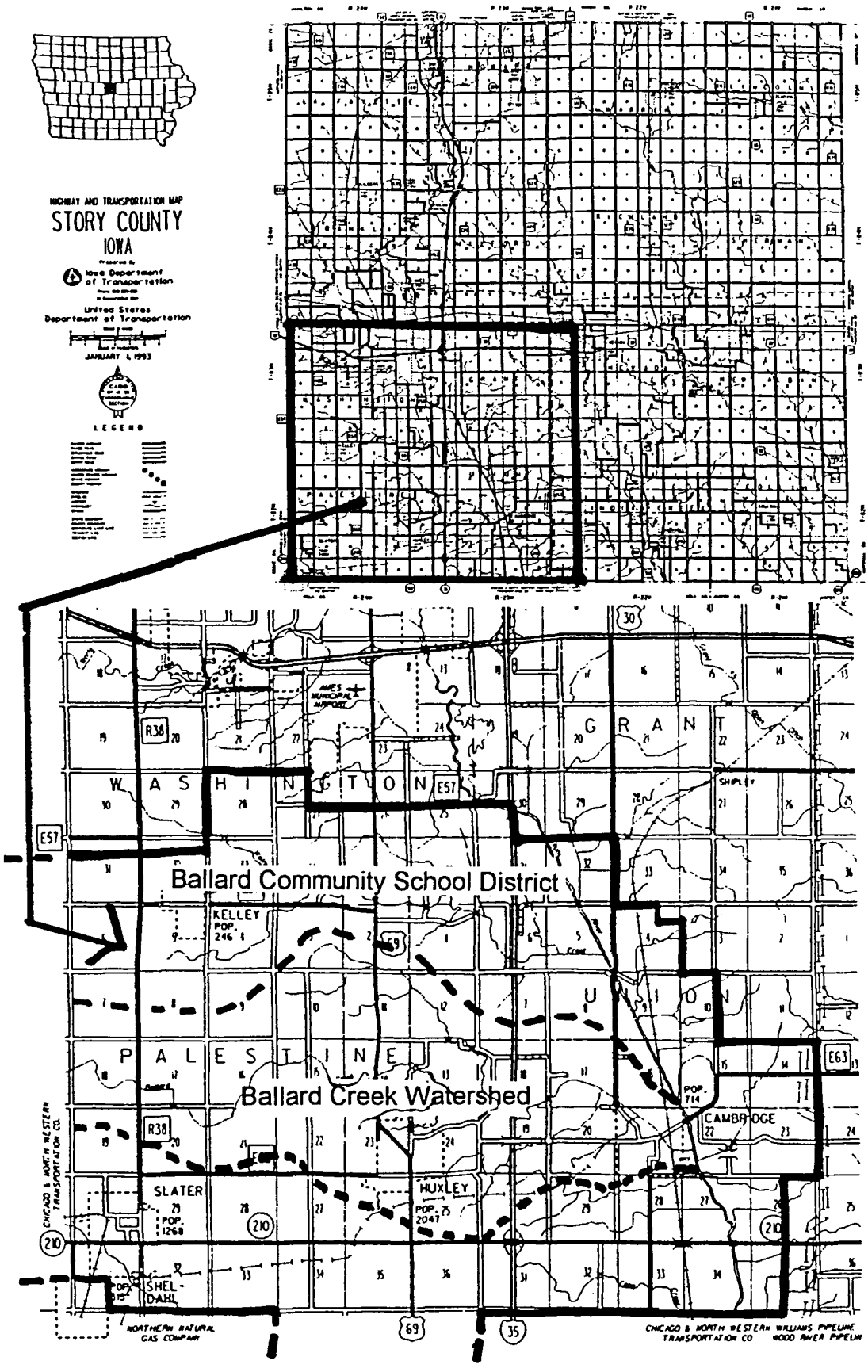
The next step in developing this method may be to develop a short manual or "how to guide" describing in more detail the development of the visual assessment survey, like landscape characteristics. A manual may encourage more planners and local volunteers to use a visual assessment survey as part of their comprehensive planning process or in any land use decision that might have a great impact on the visual landscape.

Another area of research may focus on the analysis of the values of various groups, perhaps the survey is administered to cluster groups and their responses are evaluated by comparing the values of the different cluster groups. It would be of value to know the differences in visual resource values between environmental groups, farmers, developers or companies that excavate minerals.

There is merit in using this visual assessment survey method in rural planning, but rural planners and residents should solicit input from other sources, including historical, social, economic or cultural in developing a vision for the future of their region. We need to remember that the visual landscape should not be viewed as a separate component of the total landscape. The ultimate success in protecting visual resource quality is to provide a means for protecting and enhancing all natural and cultural resources (Yuill 348). The visual landscape is not separate from the cultural, social, economic, physical environment, or political factors/issues and should be also be considered during the development and implementation of comprehensive plans.

APPENDIX A: BALLARD CREEK WATERSHED MAP AND BALLARD COMMUNITY SCHOOL DISTRICT BOUNDARY MAP


HIGHWAY AND TRANSPORTATION MAP
STORY COUNTY
IOWA
Iowa Department of Transportation
United States Department of Transportation
JANUARY 1, 1993
LEGEND
WASHINGTON
GRANT
PALESTINE
UNION
KELLEY
POP. 246
SLATER
POP. 1268
HUXLEY
CAMBRIDGE
POP. 716
SHELDAHL
POP. 315
SHIPLEY
AMES MUNICIPAL AIRPORT
NORTHERN NATURAL GAS COMPANY
CHICAGO & NORTH WESTERN TRANSPORTATION CO.
CHICAGO & NORTH WESTERN WILLIAMS PIPELINE
WOOD RIVER PIPELINE
Ballard Creek Watershed


HIGHWAY AND TRANSPORTATION MAP
STORY COUNTY
IOWA
Iowa Department of Transportation
United States Department of Transportation
JANUARY 1, 1993
LEGEND
Ballard Community School District
Ballard Creek Watershed
WASHINGTON
GRANT
PALESTINE
UNION
KELLEY
POP. 246
SLATER
POP. 1268
HUXLEY
POP. 2047
CAMBRIDGE
POP. 714
SHELDAHL
SHIPLEY
AMES MUNICIPAL AIRPORT
R38
E57
E63
30
69
35
210
CHICAGO & NORTH WESTERN TRANSPORTATION CO.
NORTHERN NATURAL GAS COMPANY
CHICAGO & NORTH WESTERN TRANSPORTATION CO
WILLIAMS PIPELINE
WOOD RIVER PIPELINE

APPENDIX B: PHOTOGRAPH SAMPLES USED FOR PHOTOBOARDS AND SLIDES IN VISUAL ASSESSMENT SURVEY MODEL TESTING.

Note: The photographs in this Appendix are shown in black and white. Where noted, the photographs used in the surveys were in color.

Landscape Characteristic: Roads. Photograph of rural road with no vegetation.

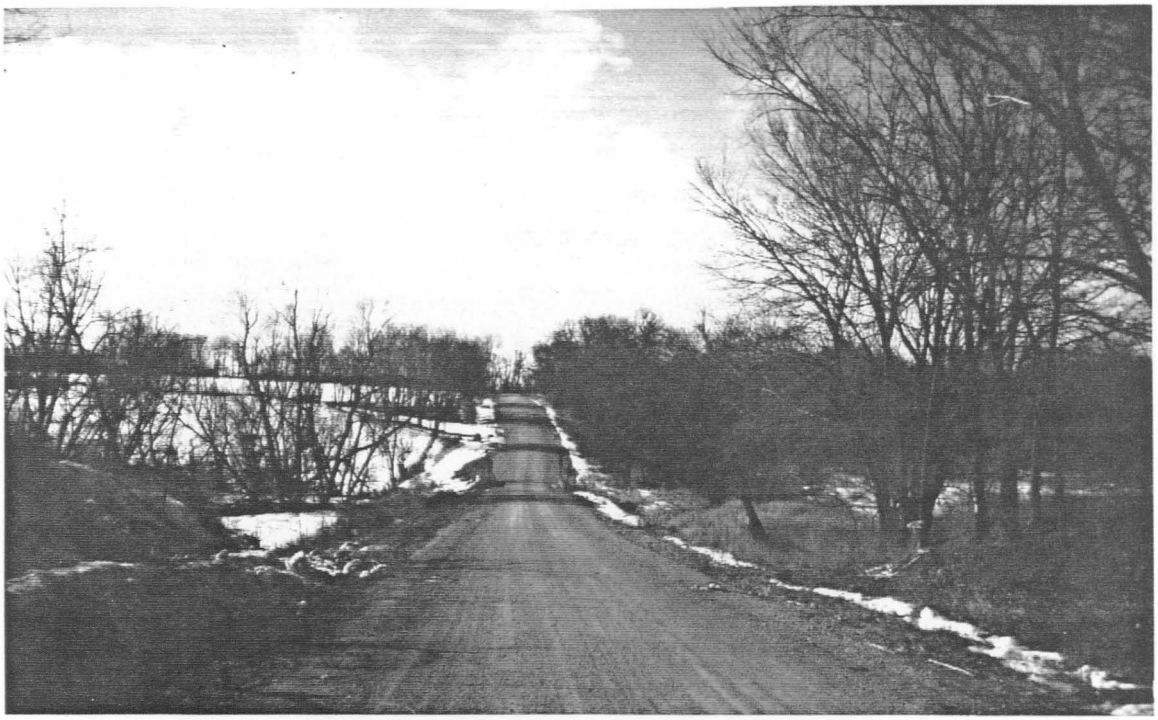
Landscape Characteristic: Road. Photograph of rural road with moderate vegetation.

Landscape Characteristic: Road. Photograph of rural road heavily wooded.

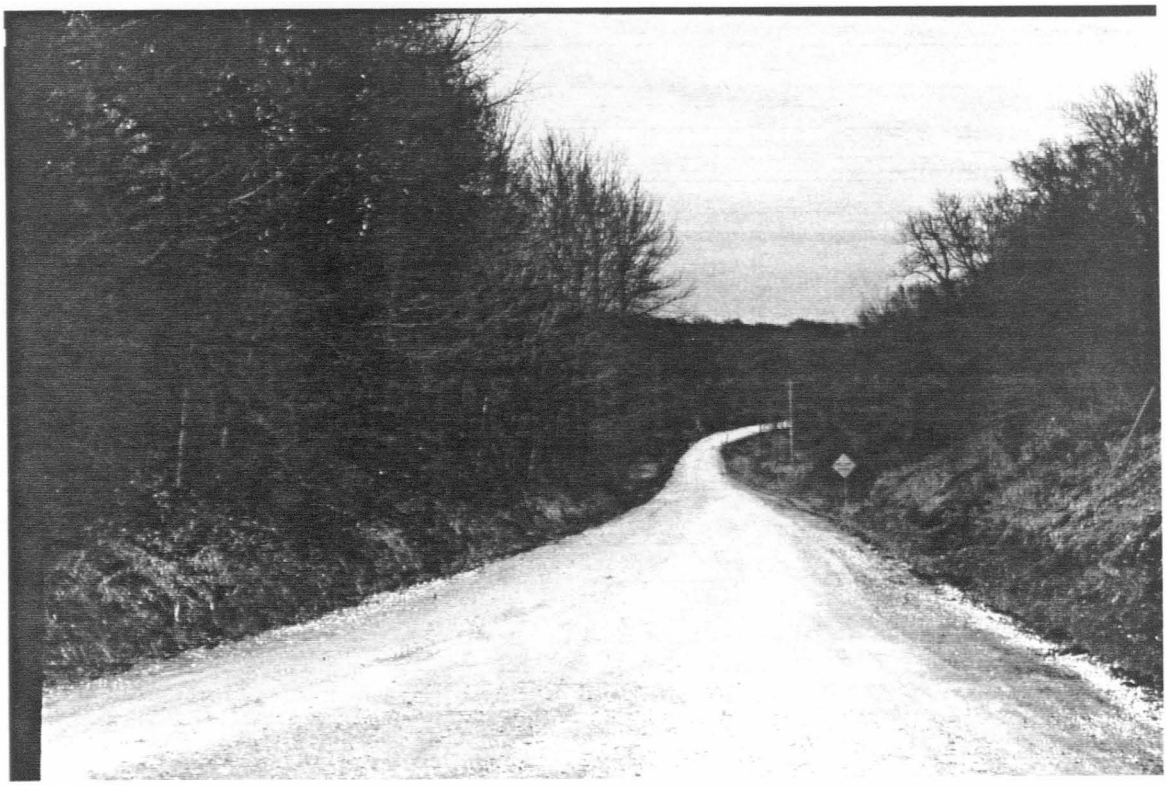
Landscape Characteristic: Stream. Rip-rap along stream bank. Photograph No. 8 in Story County Workshop survey.

Landscape Characteristic: Road. Photograph of rural road with little vegetation. Photograph No. 11 in Story County Workshop survey.

Landscape Characteristic: Road. Photograph of rural road with moderate vegetation. Photograph No. 18 in Story County Workshop survey.



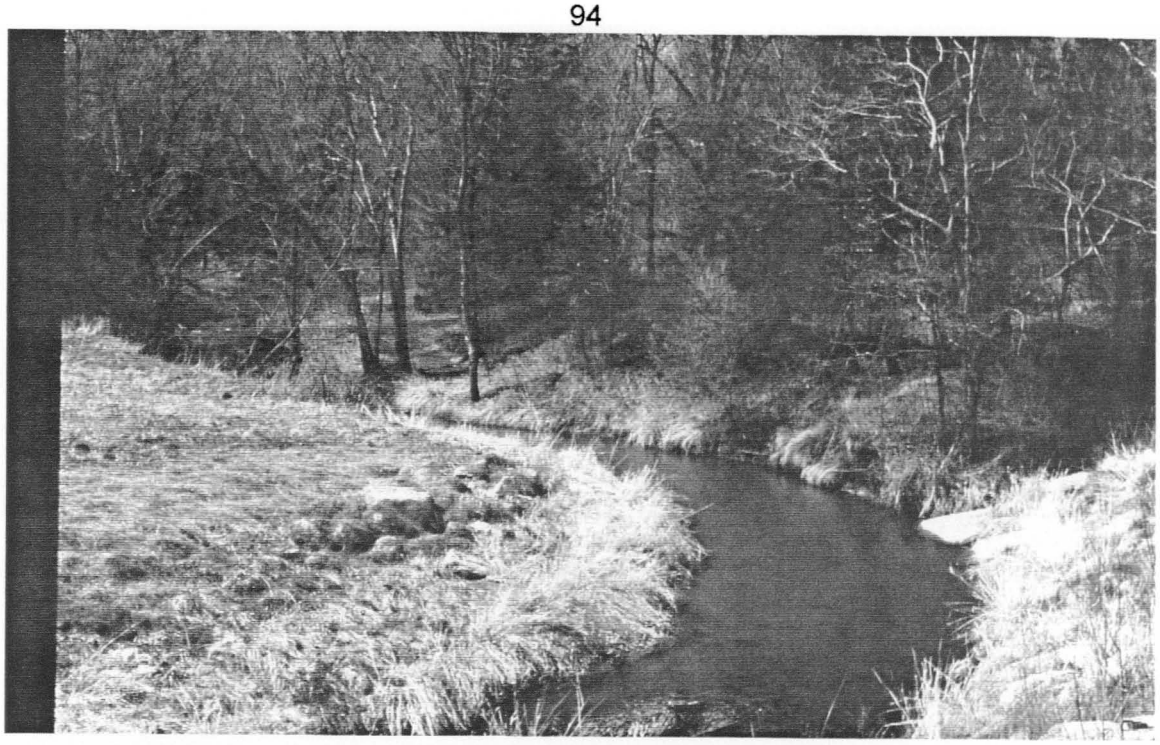
Landscape Characteristic: Road. Photograph of rural road with heavy vegetation.



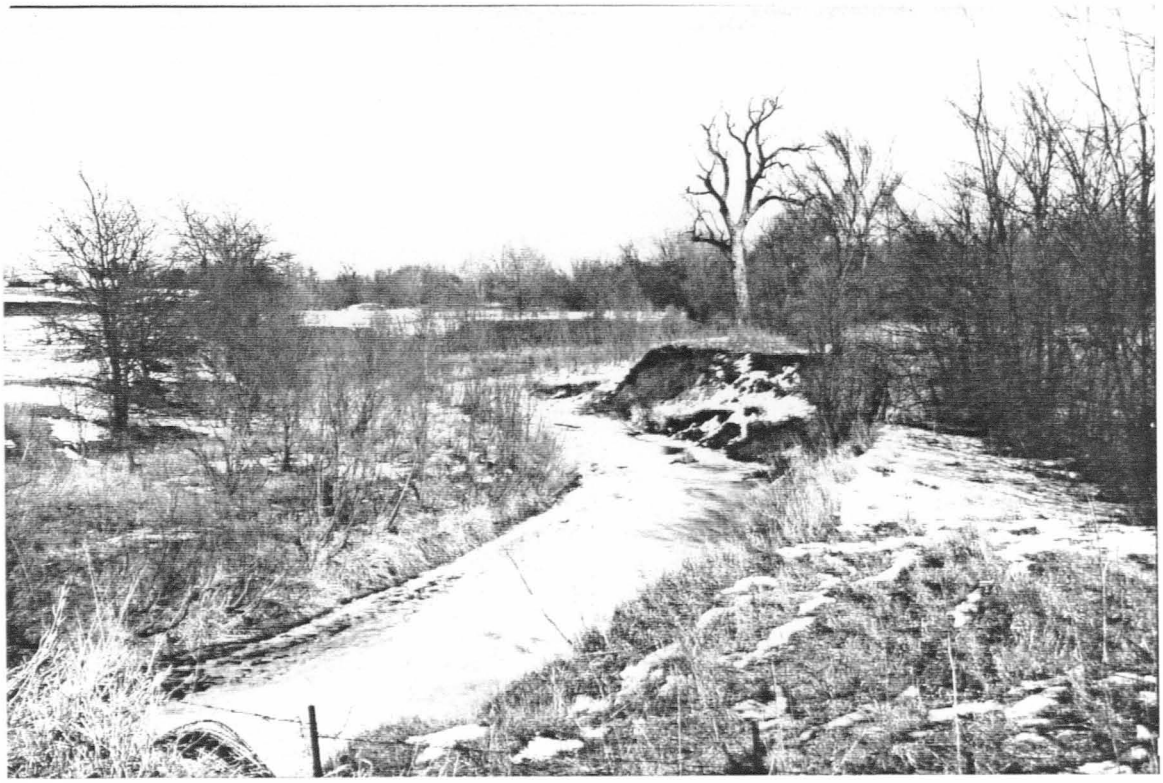
Landscape Characteristic: Road. Photograph of rural road with heavy vegetation. Photograph No. 5 in Story County Workshop survey.

Landscape Characteristic: Stream. Photograph of meandering stream with moderate vegetation.

Landscape Characteristic: Stream. Photograph of channelized stream with little vegetation.



Landscape Characteristic: Stream Photograph of meandering stream with moderate vegetation Photograph No. 3 in Story County Workshop survey.



Landscape Characteristic: Stream Photograph of meandering stream with moderate vegetation

Landscape Characteristic: Stream Photograph of wide stream with heavy vegetation on both banks

Landscape Characteristic: Stream Photograph of meandering stream with heavy vegetation Photograph No. 17 in Story County Workshop survey.

Landscape Characteristic: Stream. Photograph of channelized stream with little vegetation on banks. Photograph No. 13 in Story County Workshop visual assessment survey.

Landscape Characteristic: Stream. Photograph of channelized stream in winter with little vegetation.

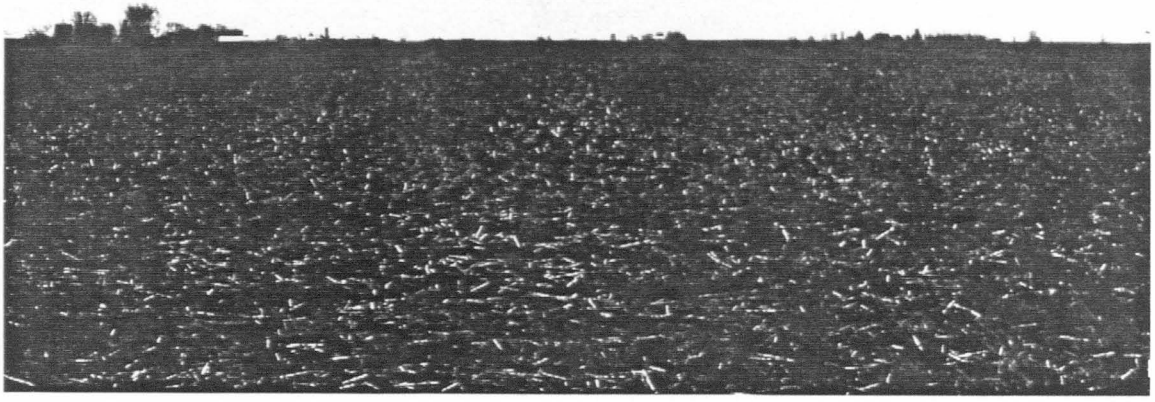
Landscape Characteristic: Field. Photograph of field with heavy vegetation on edges.

Landscape Characteristic: Field. Photograph of field with little vegetation.

Landscape Characteristic: Field. Photograph of field with heavy vegetation on edge. Photograph No. 12 in Story County Workshop survey.

Landscape Characteristic: Field. Photograph of field with moderate vegetation on edges. Photograph No. 19 in Story County Workshop survey.

Landscape Characteristic: Field Photograph of pothole in field with no vegetation Photograph No. 2 in Story County Workshop survey.



Landscape Characteristic: Field Photograph of field with no vegetation on edges Photograph No. 6 in Story County Workshop survey.

Landscape Characteristic: Field Photograph of field with little vegetation on edges

Landscape Characteristic: Field. Photograph of field with heavy vegetation on edges.

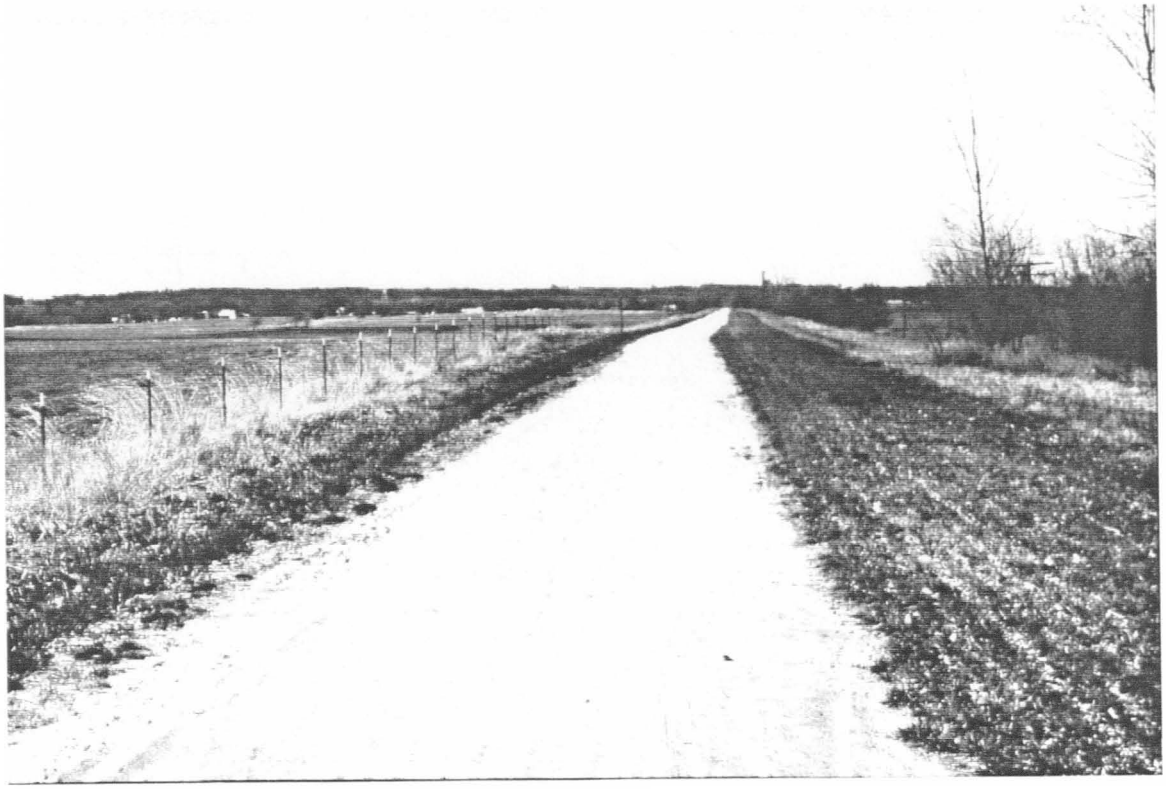
Landscape Characteristic: Field. Photograph of field with moderate vegetation on edges.

Landscape Characteristic: Trail. Photograph of trail with little vegetation.

Landscape Characteristic: Trail. Photograph of trail with moderate vegetation.

Landscape Characteristic: Trail. Photograph of trail with heavy vegetation.

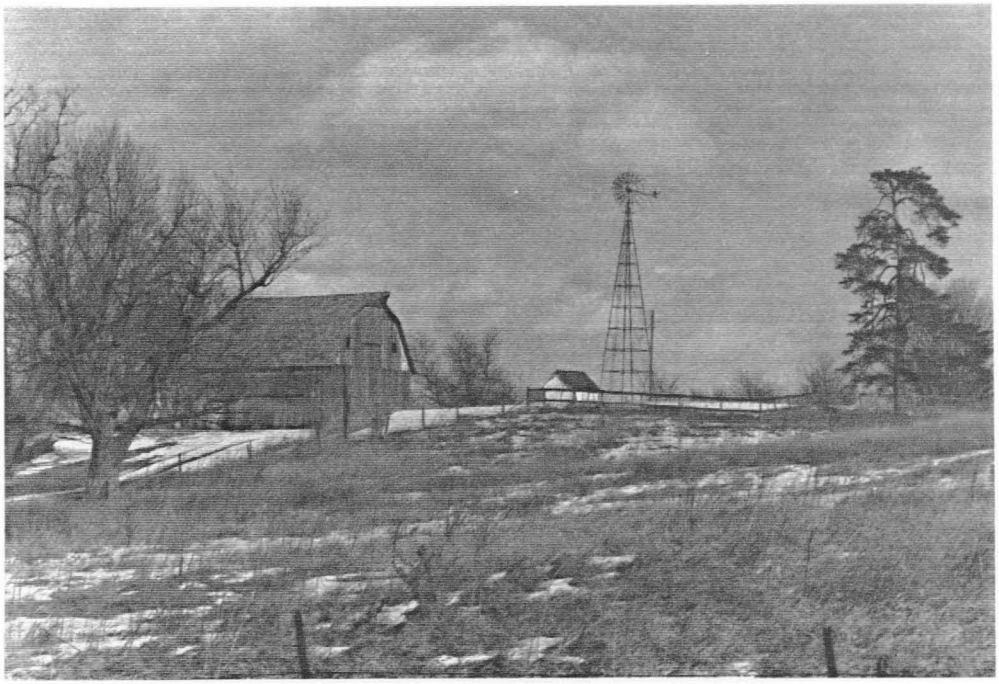
Landscape Characteristic: Trail. Photograph of trail with no vegetation.



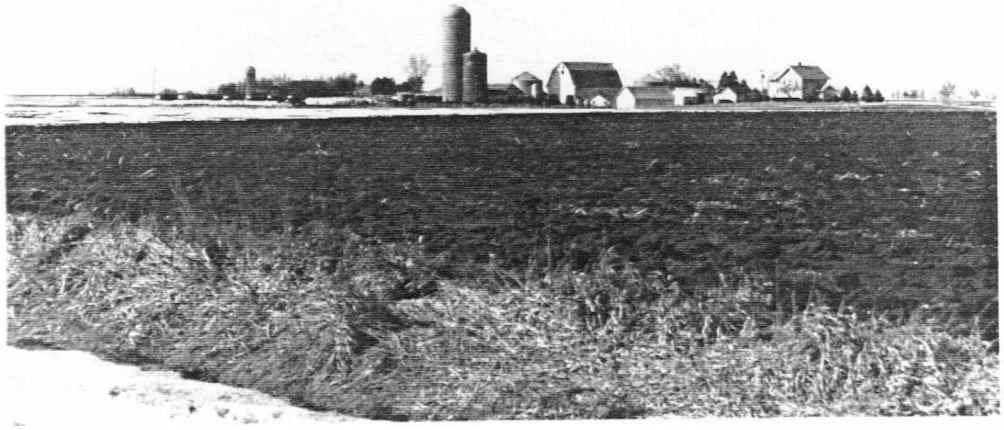
Landscape Characteristic: Trail. Photograph of trail with moderate vegetation.

Landscape Characteristic: Trail. Photograph of trail with heavy vegetation. Photograph No. 1 in Story County Workshop survey.

Landscape Characteristic: Trail. Photograph of trail with heavy vegetation.

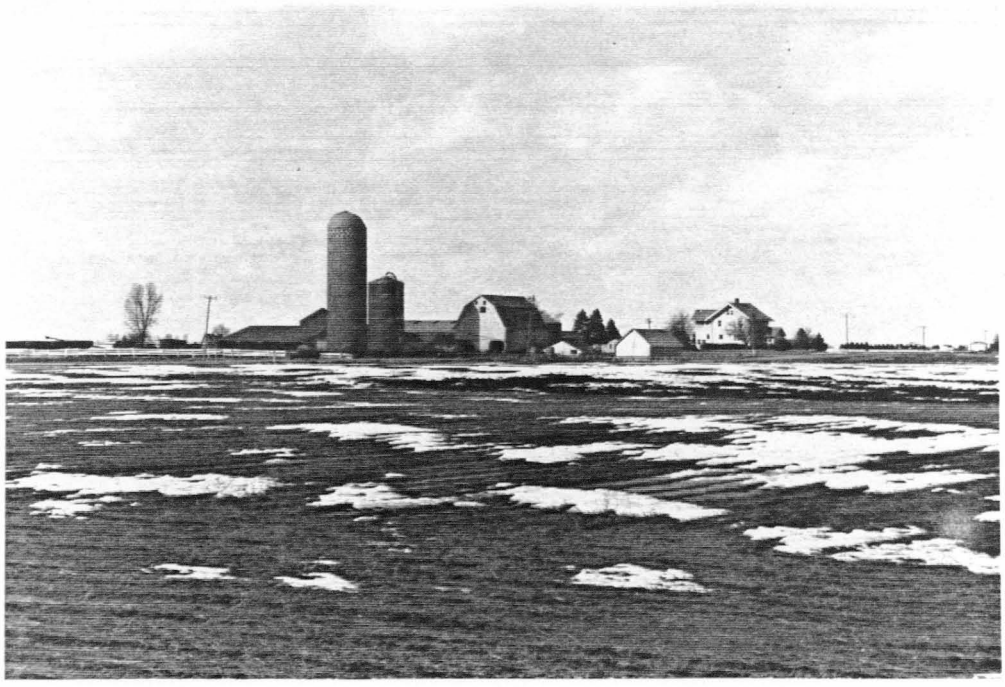


Landscape Characteristic: Cultural feature. Photograph of rustic barn and windmill.



Landscape Characteristic: Cultural feature. Photograph of traditional farmstead.

Landscape Characteristic: Cultural feature. Photograph of rural residential development.



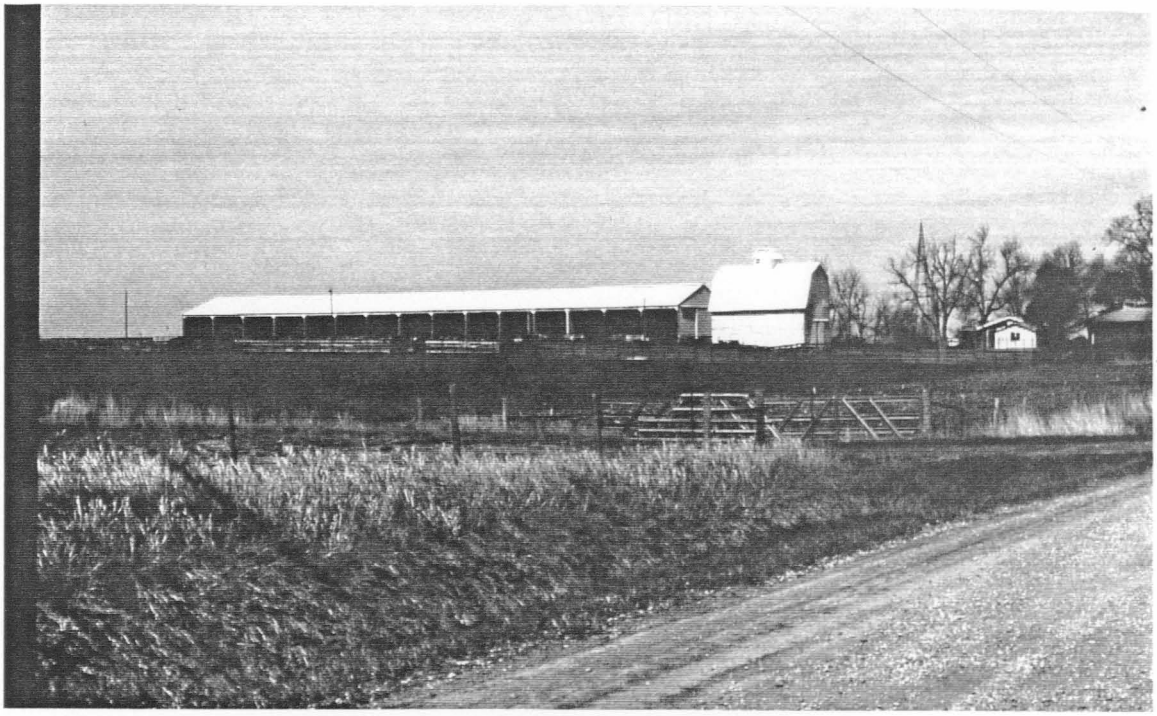
Landscape Characteristic: Cultural feature. Photograph of traditional farmstead.

Landscape Characteristic: Cultural feature. Photograph of traditional farmhouse and modern farm building.

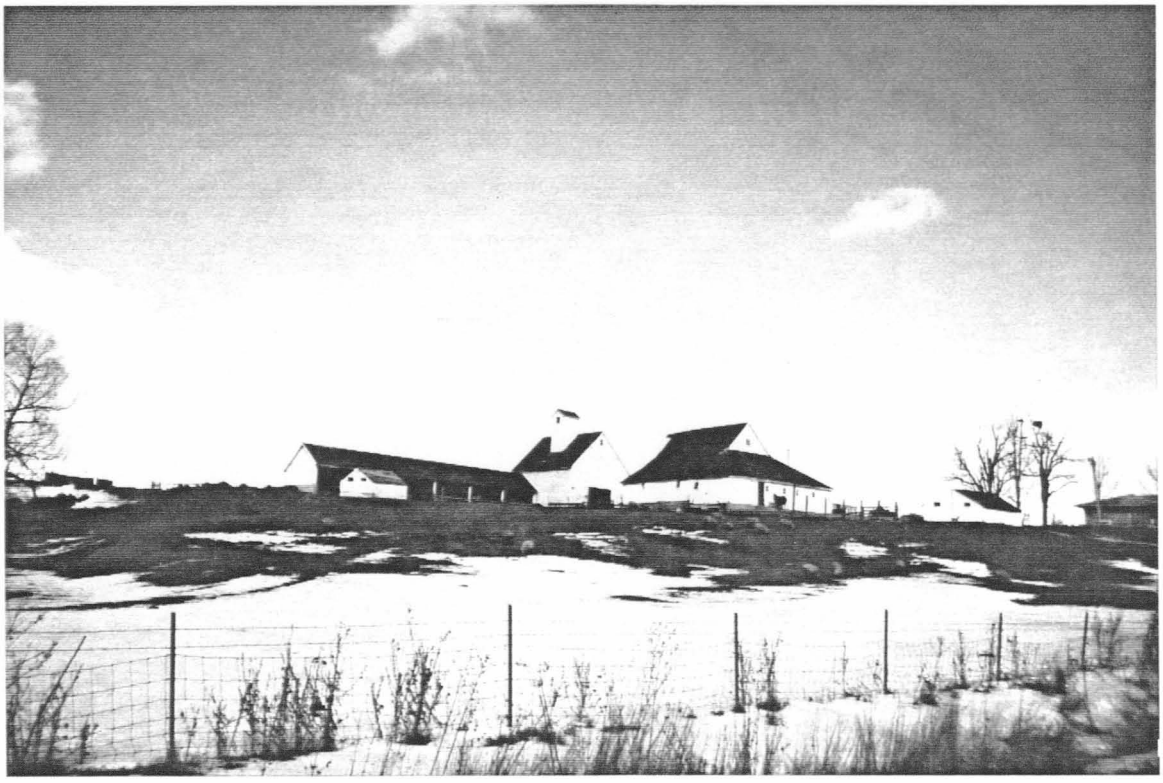
Landscape Characteristic: Cultural feature. Photograph of rustic windmill.

Landscape Characteristic: Cultural feature. Photograph of golf course.

Landscape Characteristic: Cultural feature. Photograph of rustic barn and windmill. Photograph No. 7 in Story County Workshop survey.



Landscape Characteristic: Cultural feature. Photograph of modern farm buildings with traditional barn. Photograph No.10 in Story County Workshop survey.



Landscape Characteristic: Cultural feature. Photograph of traditional farm buildings. Photograph No. 16 in Story County Workshop survey.

APPENDIX C: EQUIPMENT AND SOFTWARE LIST FOR IMAGE EDITING

Equipment

This list of equipment for image editing was prepared by Kirby Hoyt for Landscape Architecture Studio 463 in the Spring 1995 semester as part of the research for the Story County Critical Resource Study.

According to the Adobe PhotoShop User's Manual, you need the following equipment to use the software program, Adobe PhotoShop:

1) An Intel 80386 or 80486 based or faster PC with at least 4 megabytes (MB) or application random access memory (RAM) dedicated to the Adobe PhotoShop application;
2) MS-DOS 5.0 or greater and Microsoft Windows 3.0 or greater;
3) A color Standard VGA display adapter and a compatible monitor;
4) A mouse or other compatible pointing device; and
5) Current Windows drivers.

In addition, Adobe Systems recommends the following hardware and software to increase productivity and quality of workmanship:

1) An Intel 80486 or Pentium processor or a faster processor;
2) MB or more of application RAM dedicated to the Adobe PhotoShop application;
3) Super VGA using 256 colors or millions of colors at a resolution of 800 x 600 or 1024 x 768;
4) A 24-bit color display adapter and compatible color monitor;
5) A PC compatible scanner
6) A PostScript printer; and
7) Acceleration products bearing the Adobe logo.

Recommendations:

Transferring the images onto the hard drive instead of floppy disks will help in using this technique to its full advantage. The limitation of floppy disks to hold only 1.4 MB of information makes it difficult to edit images at a resolution of more than 120 dpi. The hard drive transfer method can also dictate the resolution used. It will not be beneficial to use a resolution higher than the printer is capable of printing.

APPENDIX D: SAMPLE SURVEY FORM USED FOR TESTING VISUAL ASSESSMENT SURVEY MODEL AT BALLARD COMMUNITY SCHOOLS.

Visual Assessment

Thank you for taking time to complete our survey sponsored by the Story County Planning and Zoning Office and the Department of Landscape Architecture at Iowa State University. Your opinions of the scenes represented by these photographs will help us determine local issues in the southern Story County region. There are no right or wrong answers.

Look at each slide and circle your reaction below:
(please circle only one per photo)

	Strongly Dislike	Dislike	No Preference	Like	Strongly Like
Photo #1	1	2	3	4	5
Photo #2	1	2	3	4	5
Photo #3	1	2	3	4	5
Photo #4	1	2	3	4	5
Photo #5	1	2	3	4	5
Photo #6	1	2	3	4	5
Photo #7	1	2	3	4	5
Photo #8	1	2	3	4	5
Photo #9	1	2	3	4	5
Photo #10	1	2	3	4	5
Photo #11	1	2	3	4	5
Photo #12	1	2	3	4	5
Photo #13	1	2	3	4	5
Photo #14	1	2	3	4	5
Photo #15	1	2	3	4	5

Visual Assessment
Page 2

Please indicate your sex:

1. Male_____ 2. Female_____

Please indicate what grade you are in:

1. Sixth_____2. Tenth_____ 3. Eleventh_____ 4. Twelfth_____

Where do you live?

1. Huxley____2. Slater____3. Cambridge_____ 4. Kelley_____

5. Sheldahl_____6. On a working farm_____

7. Rural residential subdivision_____

8. Rural residential single acreage____

What career do you wish to pursue after graduating from high school?

_____

Please indicate the number of persons living in your household, including yourself:

____1 person
____2 persons
____3 persons
____4 persons
____5 persons
____6 persons
____7 persons
____8 persons

APPENDIX E: TABULATION SHEET USED FOR RANKING SCENES IN PHOTOGRAPHS USED IN VISUAL ASSESSMENT SURVEYS FOR BALLARD COMMUNITY SCHOOLS AND STORY COUNTY WORKSHOP.

Tabulation Sheet
April 18, 1995
Story County Workshop

Photo #_____

Number of responses_____ X Value ___1___ =_____

Number of responses_____ X Value___2___ =_____

Number of responses _____ X Value___3___ =_____

Number of responses_____ X Value___4___ =_____

Number of responses_____ X Value___5___ =_____

Total _____

Total _____ divided by number of surveys _____=_____

Survey value for Photo is _____

APPENDIX F: SAMPLE SURVEY FORM USED FOR TESTING VISUAL ASSESSMENT SURVEY MODEL AT STORY COUNTY WORKSHOP.

Visual Assessment

Thank you for taking time to complete our survey sponsored by the Story County Planning and Zoning Office and the Department of Landscape Architecture at Iowa State University. Your opinions of the scenes represented by these slides will help us determine local issues in Story County. *There are no right or wrong answers.*

Look at the slides and circle your reaction below: ***(please circle only one per slide)***

	Strongly Dislike	Dislike	No Preference	Like	Strongly Like
Photo #1	One	Two	Three	Four	Five
Photo #2	One	Two	Three	Four	Five
Photo #3	One	Two	Three	Four	Five
Photo #4	One	Two	Three	Four	Five
Photo #5	One	Two	Three	Four	Five
Photo #6	One	Two	Three	Four	Five
Photo #7	One	Two	Three	Four	Five
Photo #8	One	Two	Three	Four	Five
Photo #9	One	Two	Three	Four	Five
Photo #10	One	Two	Three	Four	Five
Photo #11	One	Two	Three	Four	Five
Photo #12	One	Two	Three	Four	Five
Photo #13	One	Two	Three	Four	Five
Photo #14	One	Two	Three	Four	Five
Photo #15	One	Two	Three	Four	Five
Photo #16	One	Two	Three	Four	Five
Photo #17	One	Two	Three	Four	Five
Photo #18	One	Two	Three	Four	Five
Photo #19	One	Two	Three	Four	Five
Photo #20	One	Two	Three	Four	Five

APPENDIX G: INSTRUCTIONS AND PHOTOGRAPHS USED FOR TESTING VOTING MACHINES IN NEVADA AND STORY CITY.

Note: The survey instrument used color photocopies of color prints. The photographs shown in this Appendix are in black and white.

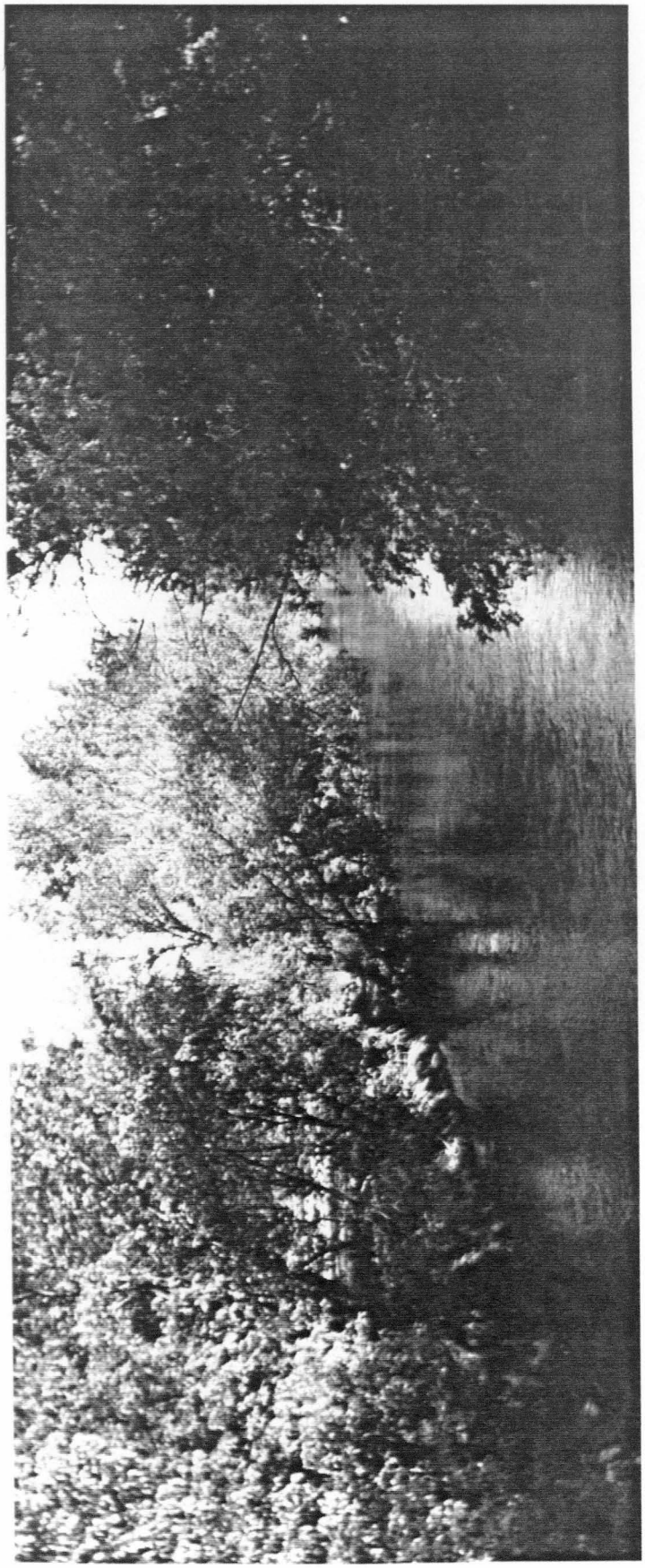
Visual Assessment Survey

The Story County Planning and Zoning Department is conducting this Visual Assessment Survey to determine what elements in the landscape the public values most.

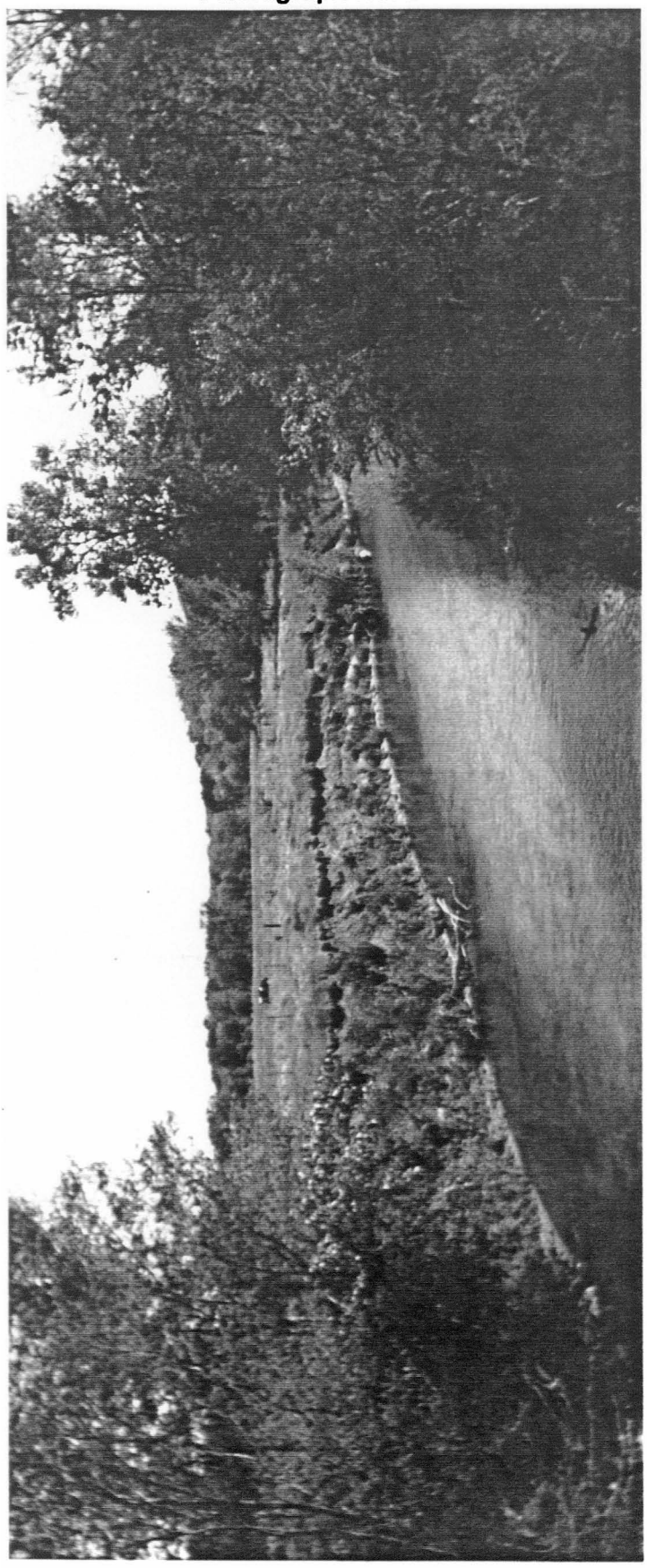
There are eight landscape scenes shown in the following photographs. These scenes are along West Indian Creek and Indian Creek in southern Story County. For each landscape scene please indicate your preference on the voting machine ballot. *There are three choices for each scene, please choose only one.*

Thank you for participating in the Visual Assessment Survey. In planning for Story County's future, the visual landscape can play a vital role. Learning what people prefer to view in the landscape will help County leaders make decisions that will benefit both the landscape and its residents.

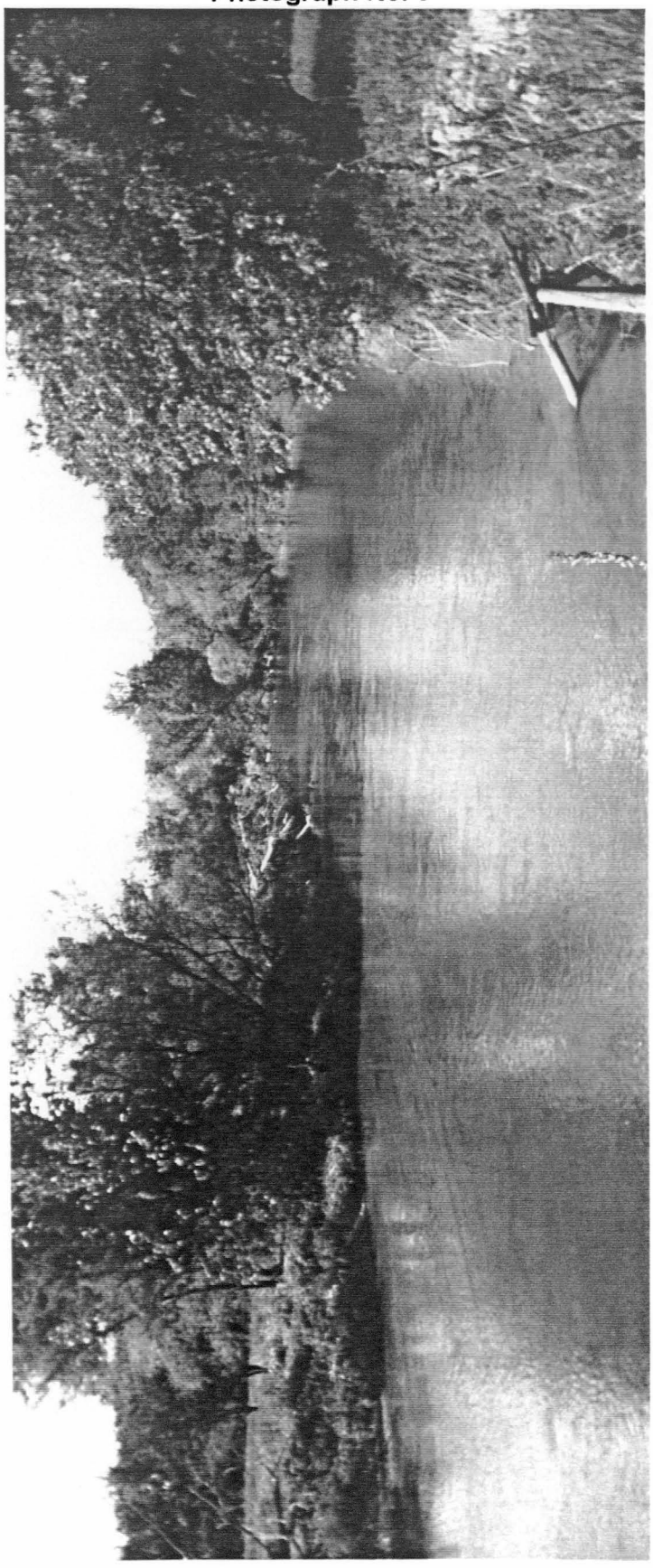
Photograph No. 1



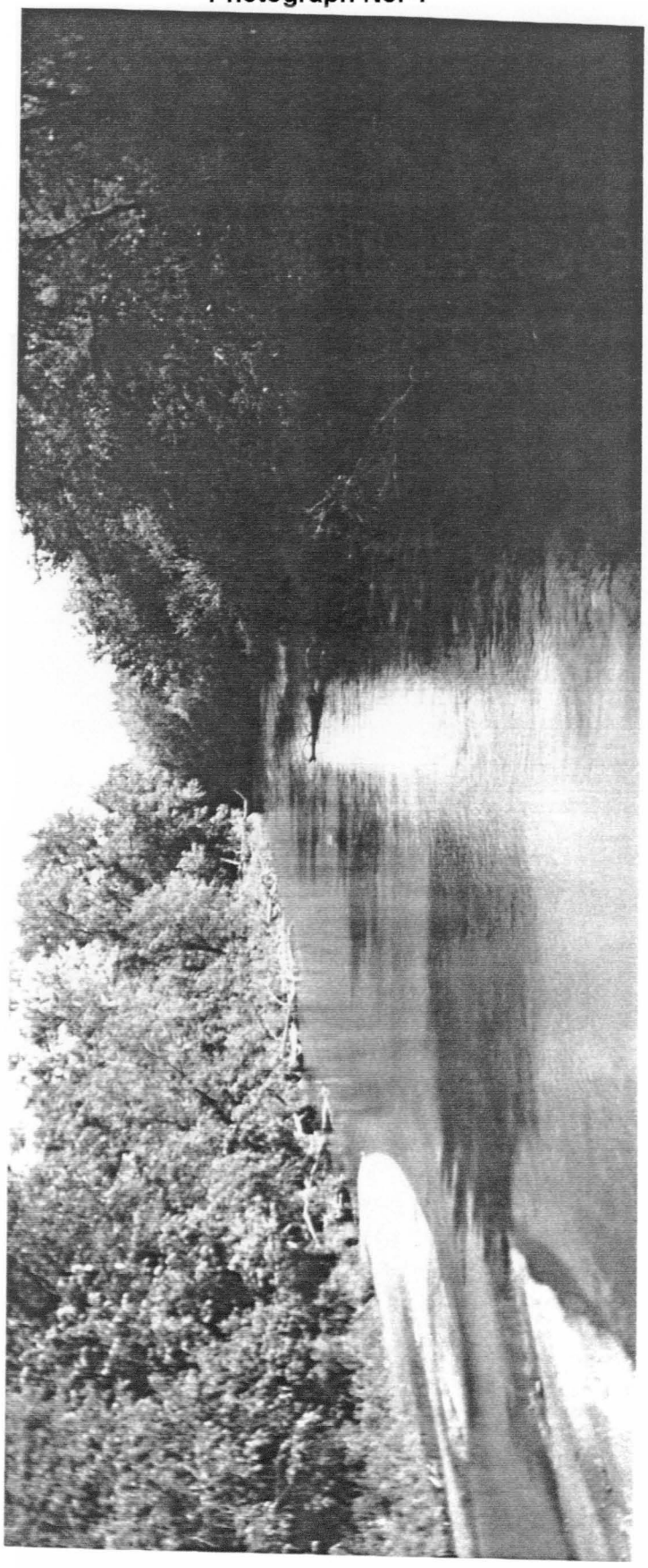
Photograph No. 2



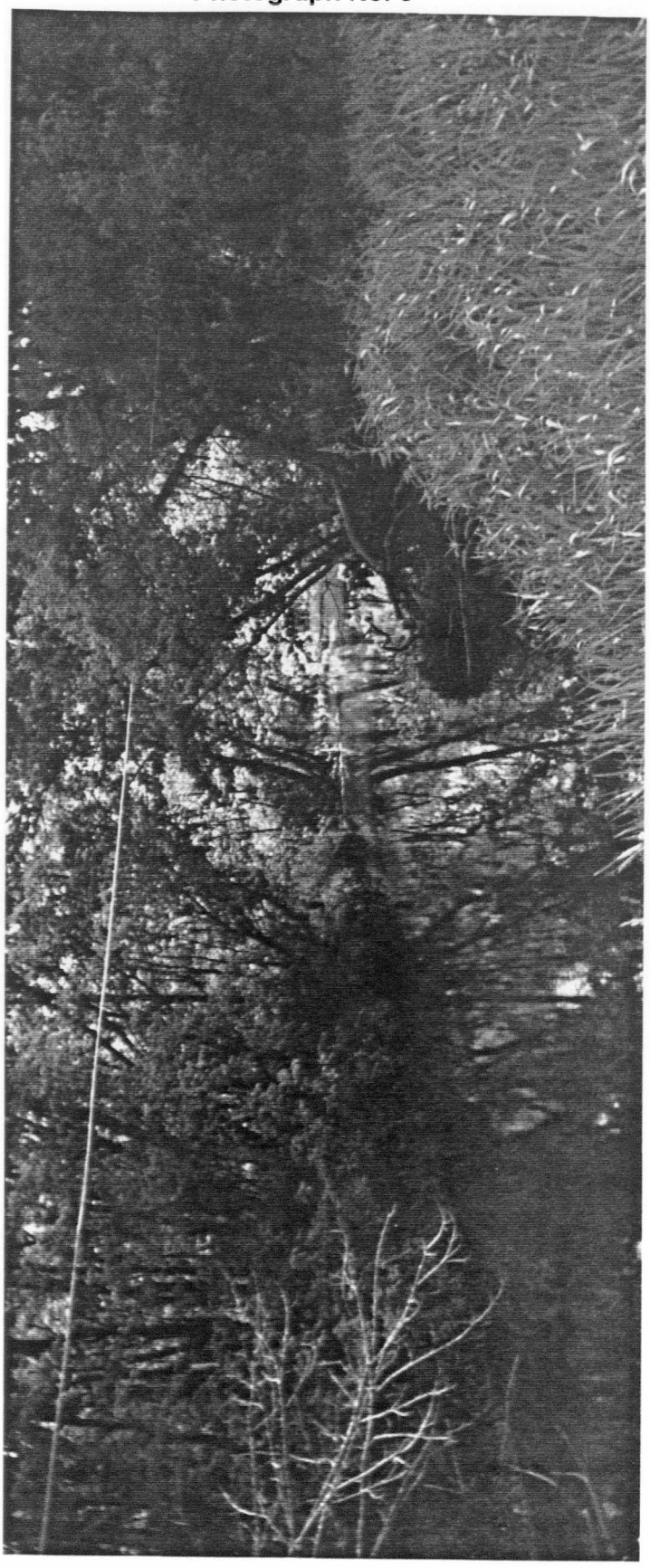
Photograph No. 3



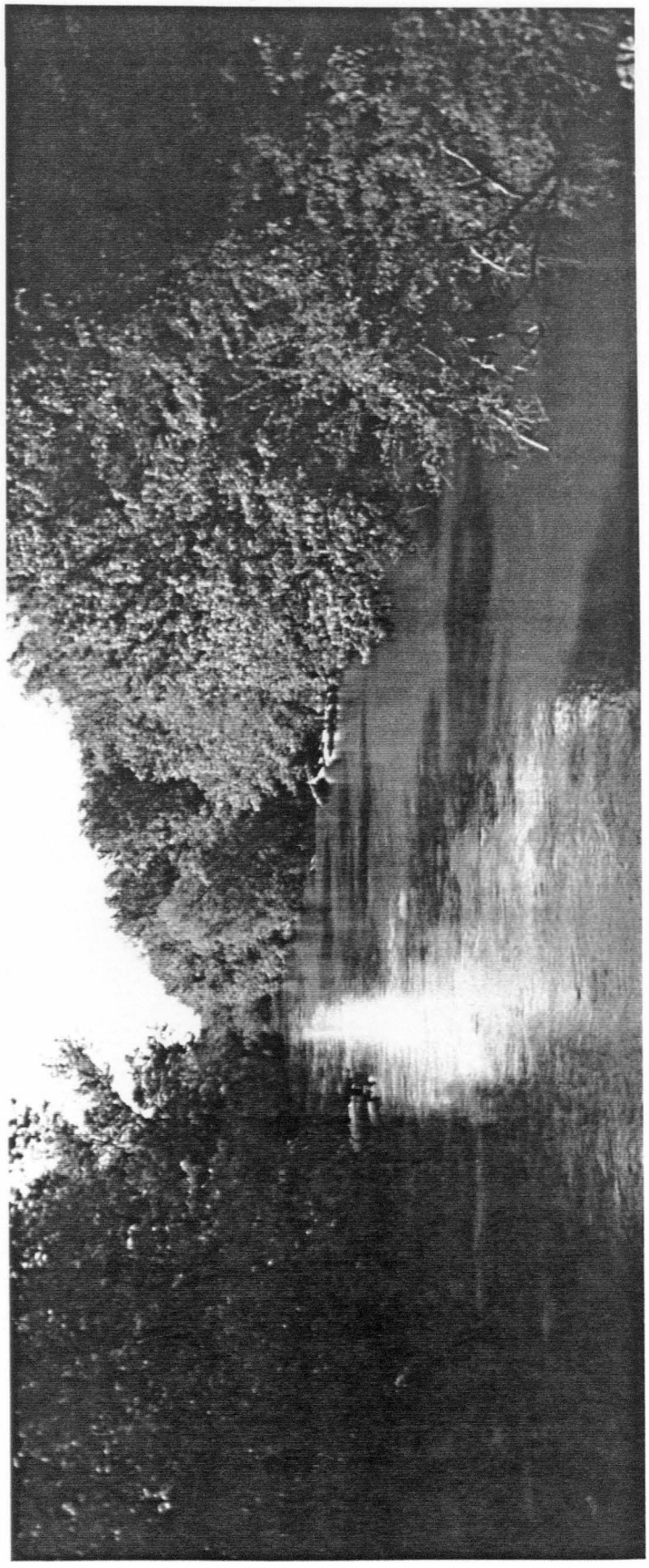
Photograph No. 4



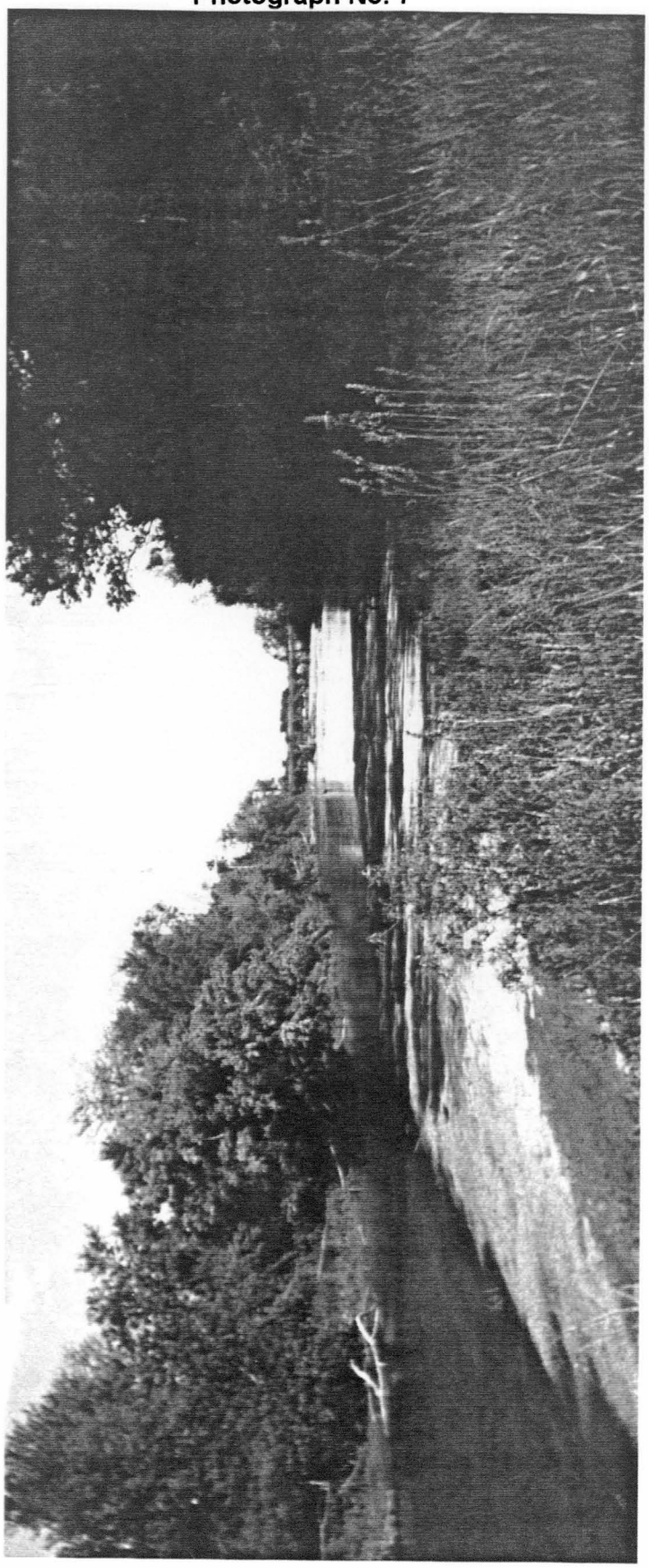
Photograph No. 5



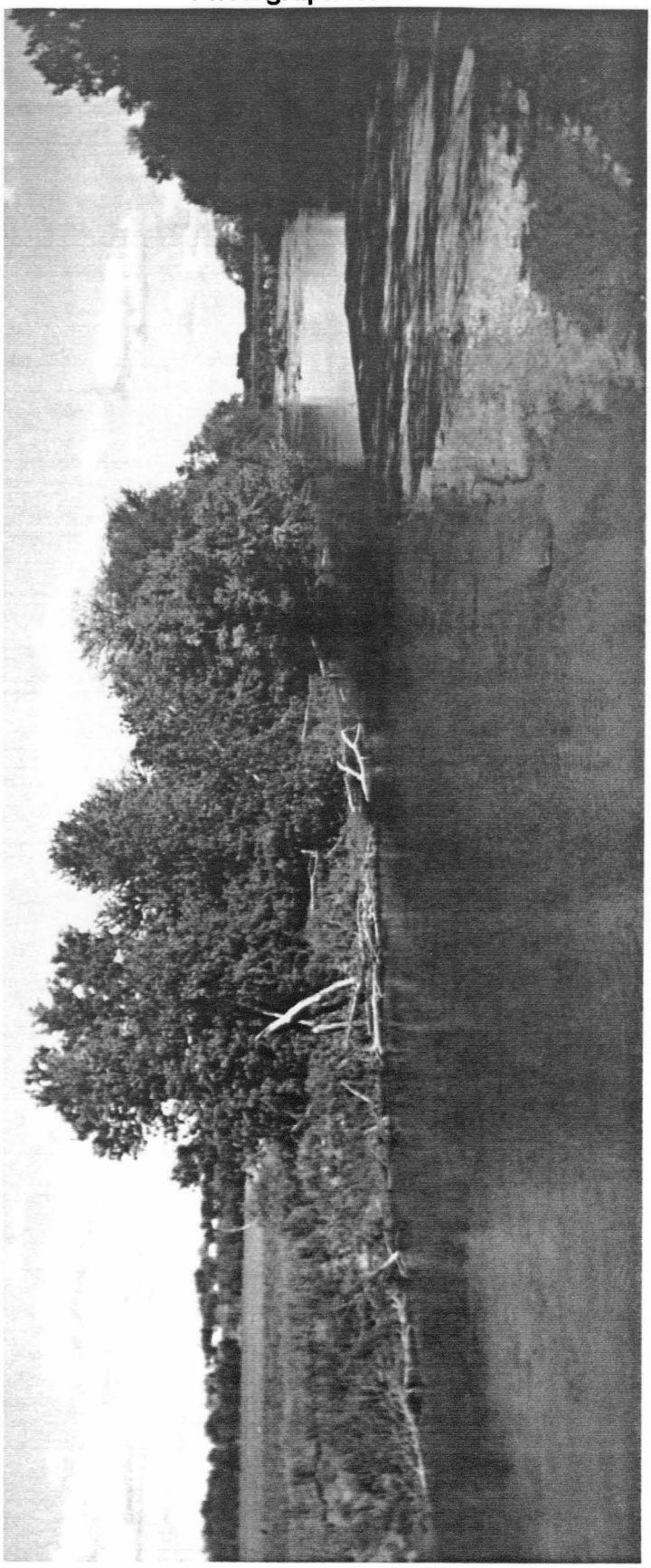
Photograph No. 6



Photograph No. 7



Photograph No. 8



APPENDIX H: VOTING MACHINE SURVEY INSTRUMENT FOR VISUAL ASSESSMENT SURVEY AT NEVADA AND STORY CITY PUBLIC LIBRARIES

PHOTOGRAPH NO. 1
STORY COUNTY
VOTE FOR NOT MORE THAN ONE

Nevada

258	LIKE	35
259	NO PREFERENCE	19
260	DISLIKE	9

PHOTOGRAPH NO. 2
STORY COUNTY
VOTE FOR NOT MORE THAN ONE

262	LIKE	30
263	NO PREFERENCE	16
264	DISLIKE	16

PHOTOGRAPH NO. 3
STORY COUNTY
VOTE FOR NOT MORE THAN ONE

266	LIKE	35
267	NO PREFERENCE	16
268	DISLIKE	11

PHOTOGRAPH NO. 4
STORY COUNTY
VOTE FOR NOT MORE THAN ONE

270	LIKE	37
271	NO PREFERENCE	17
272	DISLIKE	9

PHOTOGRAPH NO. 5
STORY COUNTY
VOTE FOR NOT MORE THAN ONE

274	LIKE	39
275	NO PREFERENCE	11
276	DISLIKE	11

PHOTOGRAPH NO. 6
STORY COUNTY
VOTE FOR NOT MORE THAN ONE

278	LIKE	45
279	NO PREFERENCE	11
280	DISLIKE	4

PHOTOGRAPH NO. 7
STORY COUNTY
VOTE FOR NOT MORE THAN ONE

282	LIKE	29
283	NO PREFERENCE	22
284	DISLIKE	11

PHOTOGRAPH NO. 8
STORY COUNTY
VOTE FOR NOT MORE THAN ONE

286	LIKE	28
287	NO PREFERENCE	19

12

QUESTION 46

PLEASE SELECT YOUR AGE GROUP.

2	1 TO 10	292
21	11 TO 17	293
5	18 TO 25	294
14	26 TO 40	295
20	41 TO 64	296
4	OVER 64	297

QUESTION 47

PLEASE SELECT YOUR GENDER.

30	MALE	300
36	FEMALE	301

QUESTION 48
STORY COUNTY

IS THIS THE FIRST TIME YOU HAVE USED A MICROVOTE VOTING MACHINE?

29	YES	305
39	NO	306

QUESTION 49
STORY COUNTY

DID YOU FIND THIS VOTING MACHINE EASY TO USE?

64	YES	309
5	NO	310

TOTAL 82

STORY COUNTY — VOTE FOR NOT MORE THAN ONE — Story City

258	LIKE	7
259	NO PREFERENCE	1
260	DISLIKE	1

PHOTOGRAPH NO. 2 — STORY COUNTY — VOTE FOR NOT MORE THAN ONE

262	LIKE	3
263	NO PREFERENCE	3
264	DISLIKE	3

PHOTOGRAPH NO. 3 — STORY COUNTY — VOTE FOR NOT MORE THAN ONE

266	LIKE	7
267	NO PREFERENCE	2
268	DISLIKE	0

PHOTOGRAPH NO. 4 — STORY COUNTY — VOTE FOR NOT MORE THAN ONE

270	LIKE	6
271	NO PREFERENCE	2
272	DISLIKE	0

PHOTOGRAPH NO. 5 — STORY COUNTY — VOTE FOR NOT MORE THAN ONE

274	LIKE	6
275	NO PREFERENCE	2
276	DISLIKE	0

PHOTOGRAPH NO. 6 — STORY COUNTY — VOTE FOR NOT MORE THAN ONE

278	LIKE	7
279	NO PREFERENCE	2
280	DISLIKE	0

PHOTOGRAPH NO. 7 — STORY COUNTY — VOTE FOR NOT MORE THAN ONE

282	LIKE	3
283	NO PREFERENCE	3
284	DISLIKE	3

PHOTOGRAPH NO. 8 — STORY COUNTY — VOTE FOR NOT MORE THAN ONE

286	LIKE	2
287	NO PREFERENCE	2
288	DISLIKE	5

QUESTION 46

PLEASE SELECT YOUR AGE GROUP.

0	1 TO 10	29
1	11 TO 17	29
0	18 TO 25	29
0	26 TO 40	29
6	41 TO 64	29
2	OVER 64	29

QUESTION 47

PLEASE SELECT YOUR GENDER.

5	MALE	30
5	FEMALE	30

QUESTION 48 — STORY COUNTY

IS THIS THE FIRST TIME YOU HAVE USED A MICROVOTE VOTING MACHINE?

5	YES	30
4	NO	30

QUESTION 49 — STORY COUNTY

DID YOU FIND THIS VOTING MACHINE EASY TO USE?

11	YES	30
0	NO	31

TOTAL 15

REFERENCES

Adams, Carolyn A. and Gary Wells. "Field Guide For Assessing Scenic quality in Countryside Landscapes - Working Draft". U.S. Department of Agriculture, Soil Conservation Service, 1985.

Arendt, Randall and Elizabeth A. Brabrec, Harry L Dodson, Christine Reid, Robert D. Yaro. Rural By Design. Chicago, IL: Planners Press American Planning Association, 1994.

Askew, Mimi. The Loess Hills Scenic Byway A Case Study Documentation. Oakland, IA: Golden Hills Resource Conservation and Development, 1993.

Buhyoff, G.J., and J.D. Wellman, H. Harvey and R.A. Fraser. "Landscape Architects' Interpretations of People's Landscape Preferences." Journal of Environmental Management. Jun. 1978: 255-256.

Canter, Larry W. Environmental Impact Assessment. New York: McGraw-Hill, Inc. 1996.

Churchward, Craig Allan. "Visual Impact Assessment Process" from the Transportation Research Board Landscape & Environmental Design Conference. 51-66 Jun 1994. Washington D.C.

Creighton, James L. The Public Involvement Manual. Cambridge, MA: ABT Book, 1981.

Dillman, Donald A. Mail & Telephone Surveys The Total Design Method. New York: John Wiley & Sons, 1978.

Feimer, Nickolaus R., Kenneth H. Craik, Richard C. Smardon and Stephen R. J. Sheppard. "Appraising the Reliability of Visual Impact Assessment Methods". Proceedings of Our National Landscape A Conference on Applied Techniques for Analysis and Management of the Visual Resource. Apr 23-25, 1979.

Fowler, Floyd J., Jr. Survey Research Methods Second Edition (from Applied Social Research Methods Series). Newbury Park, CA. Sage Publications, 1993.

Hester, Randy. "Wanted: Local Participation with a View". Public and Private Places Proceedings of the Twenty-seventh Annual Conference of the Environmental Design Research Association. Environmental Design Research Association, 1996.

Heyer, Fred. Preserving Rural Character. Chicago, IL: American Planning Association, 1990.

Kaplan, Stephen. "Perception and Landscape: Conceptions and Misconceptions". Proceedings of Our National Landscape A Conference on Applied Techniques for Analysis and Management of the Visual Resource. Apr 23-25, 1979.

Laurie, Ian C. " Aesthetic Factors in Visual Evaluation". Individual Variations in Landscape Assessment: Values, Perceptions and Resources. Stroudsburg, PA: Dowden, Hutchinson and Ross, 1975.

Magnuson, Marilyn, ed. Story County Critical Resource Study. Iowa State University. June 1995.

Matthews, David. "Community Change Through True Public Action." National Civic Review. Vol. 83 No. 4 Fall-Winter 1994: 400-404.

Phifer, Bryan M. and E. Frederick List and Boyd Faulkner. "History of Community Development in America". Community Development in America. Ames, IA: Iowa State University Press, 1980.

Schauman, Sally. "Determining Countryside Scenic Value Through the Eyes of Local Farmers." University of Washington, Seattle, WA: Department of Landscape Architecture, 1986.

Schauman, Sally. "Scenic Value of Countryside Landscapes to Local Residents: A Whatcom County, Washington Case Study." Landscape Journal. The University of Wisconsin Press: Vol. 7, No. 1, Spring 1988: 40-46.

Shafer, Jr. E. L. and R. O. Brush. "How to Measure Preferences for Photographs of Natural Landscapes". Landscape Planning. 1977. Vol. 4: 237-256.

Smardon, Richard D., James F. Palmer and John P. Felleman eds. Foundations for Visual Project Analysis. New York: John Wiley & Sons, 1986.

So, Frank S. and Judith Getzels, eds. The Practice of Local Government Planning (Municipal Management Series). Washington, DC: International City Management Association, 1988.

Stokes, Samuel N., A. Elizabeth Watson, Genevieve P. Keller, and J. Timothy Keller. Saving America's Countryside A Guide to Rural Conservation. Baltimore: The Johns Hopkins University Press, 1989.

Vining, Joanne and Joseph J. Stevens. "The Assessment of Landscape Quality: Major Methodological Considerations". Foundations for Visual Project Analysis. New York: John Wiley & Sons, 1986.

Wright, G. "Appraisal of Visual Landscape Qualities in A Region Selected for Accelerated Growth." Landscape Planning. 807-327. Vol. 1, 1974.

Yuill, Charles B. and Spencer A. Joyner, Jr. "Assessing the Visual Resource and Visual Development Suitability Values in Metropolitanizing Landscapes". Proceedings of Our National Landscape A Conference on Applied Techniques for Analysis and Management of the Visual Resource. Apr 23-25, 1979.

Zimmerman, Marc A. and Julian Rappaport. "Citizen Participation, Perceived Control, and Psychological Empowerment." American Journal of Community Psychology, 725-748. Vol. 16, No. 5, 1988.

Zube, E.H. and R.O. Brush and J. Gy Fabos eds. Individual Variations in Landscape Assessment: Values, Perceptions and Resources. Stroudsburg, PA: Dowden, Hutchinson and Ross, 1975.