TOWARD RECREATIONAL–ENVIRONMENTAL BALANCE
A Paper by
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The purpose of this paper is to describe reservoir recreation and tourism functions and how foresight in planning may avoid environmental degradation. Based upon observation of land development around reservoirs in Texas and elsewhere and upon the application of land design principles, it is my conclusion that many of the present problems arise from a lack of understanding water-based recreation and tourism and also from the lack of leadership for land design, guidance and control. Conversely, it would appear that a high degree of dynamic equilibrium between recreational use and the environmental settings can be achieved but only by means of certain planning and management measures. A review of present typical reservoir recreational development and its impact may establish a base for understanding some basic problems.

PRESENT RESERVOIR DEVELOPMENT FOR RECREATION

Probably no other geographic area has experienced as rapid a growth of water recreational development as has Texas—largely because of the great growth of major reservoirs. Only a generation ago, there were virtually no major inland water bodies in Texas. Between 1960–1965, boat registrations in Texas increased two times faster than the population growth. (Reed and Reid: 1969, 5). The image of Texas as an arid plain devoid of recreational utility is now contradicted by fact.
Few natural resource factors are any more powerful in creating demand for tourism and recreation than water. It holds a magnetism for a variety of activities in addition to those directly associated with water.

But, this view is dramatically different from that of reservoir builders. Builders of reservoirs consider water basically as a commodity—either to be held back to avoid destructive forces of flooding, as a mass for power generation, or as a resource that can be sold by the gallon. Recreational users care little about these characteristics and consider a reservoir a lake with all its inherent advantages for pleasure and enrichments. Highly sophisticated plans and management schemes are exercised for reservoirs as commodities while virtually no plans or management schemes are prepared for overall tourism and recreational development stimulated by a reservoir. The pressures for recreational growth are strong and predictably will continue.

Observation suggests that each new reservoir passes through a cycle of recreational development. Understanding this cycle may assist in dealing with the problems inherent in reservoir recreational expansion.

First, as landlubbers, the majority of people have a desire to participate in water recreation activities—those that take place directly in or on the water, preferably in lakes. Even when a reservoir is first announced, there is some mental speculation by the public regarding its possible use of this new alternative to present recreational destinations. People are lured by the glamour and special excitement derived from such activities as fishing, swimming, water-skiing, boating, sailing, canoeing, scuba diving, house-boating and other water-oriented activities. The popularity of these is fostered by the fact that generally they require low skills, low investment and the recreational objective can be attained rather rapidly. While it is true that only higher income brackets are able to own expensive cruisers, the
masses can swim, fish and boat at relatively low costs. Wherever access allows (frequently at points where existing highways or public property coincides with the new reservoir edge) mass visitation begins.

Second, many water resource managers have discovered that probably the greatest recreational participation is not in or on the water but at the water's edge. Even less skill and cost is required to lounge, sunbathe, wade, shore fish, build sand castles, hike and picnic along the shore. While a few prefer solitude, more appear to demand crowds. If highway right-of-way allows penetration of the reservoir, adjacent lands soon experience great spillover in demand. In order to satisfy this demand, a degree of investment in land facilities, such as marinas, bathhouses, refreshment stands, parking and sometimes beach improvement is required.

The third and final stage is participation in "vicinity" activities. Spurs off existing highways are added to allow penetration back of the shoreline. People begin to seek vacation homes, recreational vehicle areas and parks near the reservoir but not necessarily at the water's edge. For example, within a two-mile radius of Cedar Creek and Lake Livingston reservoirs, a recent study by one of our graduate students identified 105 separate vacation home subdivisions. (Glaze: 1972). If a community already exists within the vicinity of the reservoir, it soon becomes a target for related recreational activities such as shopping, golf, entertainment and visiting friends and relatives. It is in this third zone--the vicinity--that probably the greatest capital investment takes place and also where some of the greatest land use problems arise. While some reservoir developer-managers have begun to deal with the first two recreational zones, very few have even considered the very important third zone--the vicinity.

Concurrent with the growth pressure by the public for participation in recreation activities in these three zones is the spiralling impact upon the
entire area surrounding the reservoir. Property owners, speculators, investors and developers of facilities and services soon see the potential lure of the reservoir. Along roadsides near the reservoir, new supporting businesses begin to spring up. Boat equipment sales, hamburger and snack shops, and real estate booths begin to appear. Businessmen see opportunities for commercial success and begin to invest in facilities. Economic impact in the vicinity can be significant. For example, the annual economic impact of Somerville Reservoir by both local and outside recreationists is an estimated $9 million. (Saitta and Bury: 1972, 80). Along with such growth comes a demand for greater distribution and volume of public services such as power, protection and roads. One of the greatest changes is the impact upon the existing road system as millions of new visitors attempt to use highways designed for low density farm-to-market use. The increased mass use of the reservoir also brings new attractions, such as theme parks and specialty sales for recreationists. While these increase employment and economic impact they are frequently of low quality—both in appearance and in service. As this growth develops, advertising of the area begins which, in turn, hastens the expansion process but not always in the best direction.

RECREATIONAL DEVELOPMENT PROBLEMS

While many good things can be said about present recreational growth—greater pleasure and enrichment for masses of people and greater economic impact—poorly planned and fragmented growth results in an imbalance between natural and cultural resources on the one hand and recreational use on the other.

Concentration of development surrounding reservoirs often creates water quality problems. It is not unusual for resorts, marinas, and houseboats to
spill their sewage directly into the nearby waters. Furthermore, the runoff from vacation home subdivisions usually drains into the adjacent reservoir or its tributaries causing another kind of problem— that of eutrophication from insecticides, herbicides and fertilizers as well as additional silting from the erosion of new land development.

New development around reservoirs creates a variety of erosion problems not the least of which is erosion of scenery. In the process of constructing roads, power lines, parking areas and building sites, the land is most often cleared and graded, causing greater surface water runoff and general degradation of the landscape. Compaction of soils from trampling and camping, cutting of dunebuggy and motorbike trails, and general removal of lands from existing soil, range and forest management practices create additional erosion problems. Frequently, it is the scenic image that first attracts recreational visitors. This amenity can be lost many times more quickly than it can be restored. New allocation of funds for roads and utilities tend to add to existing situations on a patchwork basis rather than to fundamentally sound locations. Pricing, ease of access, and incomplete knowledge of resources can lead to mis-allocation or preempt of sites better suited to other than recreation uses, e.g. agriculture.

The explosion of resort, touristic and recreational development can force a heavy drain upon community services nearby. Even though individual sites may be well-planned and managed, the added electric power, natural gas, and fuel oil must be provided by someone who in turn extracts additional resource assets from the earth. The expanded governmental services, such as water supply, fire control, health services and schools are a drain on the area's resources. To what extent are these considered in planning new reservoirs?
Already, hundreds of vacation homes have been built upon lands devoid of adequate sewage and solid waste disposal on faith that some governmental unit will someday relieve the situation.

Because recreational uses of waters is not equally dispersed and because many uses demand great quantities of surface area, conflicts arise as expansion takes place. Sometimes these are very open; sometimes, very subtle. Both time and spatial zoning may be required in order to prevent waterskiing, boating, sailing, fishing and swimming from taking place in the same waters at the same time.

Reservoirs create a dramatic culture shock to established communities near reservoirs—the shock resulting from conflicts between values held by local citizens and the new volumes of visitors. Long-time citizens of reservoir lands tend to resent the invasion of hordes of newcomers who jam their roads, overrun their lands, and compete for local services.

As reservoirs are developed jurisdictional disputes over responsibilities tend to delay the development of adequate safety and security controls. Reservoir authorities are generally more concerned with the water impoundment and nearby political units are unable to finance and staff up to meet the new needs. Hence, millions of visitors may be completely without police protection or rescue and first aid service.

Much of what has been said about environmental degradation contributes toward the lowering of user satisfactions—the very key to successful tourism and recreation. Recreationists seek clean waters, pleasant scenery, stable facilities, orderly management and freedom from conflict. When these can not be delivered the quality of the user experience is not what it might be. When this happens, both social and economic inputs suffer.

When the quality of recreational offerings is low, there tends to be an
accompanying low level of business success. The right of private enterprise to establish itself anywhere at any time sometimes attracts inexperienced managers and poor facilities. The strip clutter that usually follows the roads is familiar to many who seek reservoir recreation.

At this point, it may be reasonable to conclude that reservoir recreation, as we now allow it to happen, is a mixed blessing. It adds to the mental and social welfare of our citizenry and stimulates the local economy at the same time that it creates many environmental problems. One may be prompted to raise the question whether any development should take place at all. Strict prohibition of recreation is the policy of some foreign governments toward reservoir development. On the other hand, inasmuch as concerted effort toward planned development has not really been tried it would appear to hold some promise of providing environmentally sound development at the same time the social and economic values are obtained.

RECOMMENDATIONS

Recommended here are two groups of ideas that may have value if tested:
1) some basic concepts and 2) a recreation planning process to be integrated with primary reservoir planning.

Some Basic Concepts
1. Lands surrounding reservoirs should be designed in segments radiating from the reservoir rather than concentrically around the reservoir.

   Around any reservoir, the resources for recreation are not equally distributed. Natural sand beaches, knolls, flats, open plains, wooded areas and special wildlife attractions are of varying importance around a reservoir. Furthermore, cultural development, such as highway access, relationship to nearby community and historic sites are stronger at some sites than others.
When access roads or vacation home development tightly circle the reservoir, the backlands are denied access and esthetic vistas of the water. Because "vicinity" activities are as important as "water" activities, they should be considered in original planning.

2. Different design densities are required for different recreational objectives.

A corollary of the above concept of peripheral development segments is the idea of varying design density. High density concentrations are desirable for mass beach users, for example. Better management and control, including sanitary facilities, food service and safety can be handled in high density concentrations. Provisions for high density use can relieve pressure on other surrounding lands making them better suited to low density use, such as for primitive camping, hiking and nature interpretation.

3. Segments adjacent to communities demand emphasis on services.

Those land segments around a reservoir that lead to or are adjacent to communities are best suited to community-related development. Because recreationists need and desire an array of services and products, well-designed service areas should be integrated with nearby community planning and design. If no community service center exists, one may need to be created.

4. Waterfront control must be integrated with the recreational uses of all waterfront segments.

Increasingly, waterfronts are being viewed as public goods. In Wisconsin, a legislative act of 1966 requires special county shoreline zoning for environmental control. (Yanggen and Kusler: 1968, 73). Minnesota has developed similar controls over shoreland development adjusted to classes of lakes. (Snyder: 1970). But, it should be recognized that land uses around the perimeter of the waterline are not uniform and therefore regulations must reflect varying need.
5. Segments that possess special attributes such as historical, ecological or archeological importance, may require special controls.

Some waterfronts and surrounding lands contain unique characteristics that could be destroyed or severely impaired if promiscuous development took place. Such lands should be withheld from development or held until that time that appropriate development could take place. Appropriate development might include interpretive programs or visitor centers and museums that perpetuate the significance of the site.

6. Land management systems for both the reservoir and surrounding land must be integrated.

Land and water development in this country is performed by three major sectors: private enterprise, non-profit organizations and governments. Some means must be devised to foster collaboration and cooperation of decision-makers within all three sectors immediately upon the inception of a reservoir and throughout its history. This means that recreational functions be considered in all steps of the reservoir decision-making process. The implications of water-commodity decisions upon recreational uses, such as maintenance of conservation pools or complete periodic reservoir drainage, need to be assessed early in the planning and development stages.

These and other fundamentals that can foster the protection of the basic environmental assets and yet allow human use and enrichment from reservoir use need to be made operative. In addition, a recreation planning process should be adopted that will integrate recreational uses with other reservoir functions.

Reservoir Recreation Planning Process

Four basic steps should assist greatly in meeting both recreational needs and environmental balance: 1) research, 2) analysis-synthesis, 3) concepts and recommendations and 4) development-protection programs. These steps require a team effort with inputs from several specialized fields together with frequent
citizen feedback.

1. Research

Even before a reservoir is completed, much can be projected concerning recreation if fundamental research steps have been taken. The purpose of this fact-gathering is to gain knowledge about the characteristics of an area that may relate to tourism-recreation development. It is of little value to accumulate mountains of data if the meaning for recreation is not known.

Recently, we have experimented with land research and analysis techniques in several areas of Texas that may have merit in conjunction with reservoir planning. (Gunn: 1972a). These studies are primarily concerned with matching resource characteristics with potential recreational need. Only after this is assessed are other feasibility factors (price, ownership, legal control) utilized. The emphasis is upon spatial distribution and qualitative relationships rather than quantitative projections.

The basic natural resource factors to be examined are: Topography and soils, water and waterlife, vegetative cover, climate and wildlife. The cultural resource factors are: existing developed attractions, history, folklore, ethnic background and esthetics. The purpose of the examination is to determine the locations of those areas particularly rich (or weak) in potential support for the development of recreation. Based upon professional judgement, each factor is quantified numerically producing map overlays that can be aggregated. The sum of numbers produces a composite map representing the total of all natural and cultural resource factors.

Experience and research by others shows that nearness to highways, markets and service centers enhances the development desirability of sites. Therefore, the basic resource scores are multiplied by factors representing transportation, markets and the infrastructure supplied by the local community. This produces a visual assessment of the relative importance of modified resources for tourism-
recreation development. It should be emphasized that such a land-scanning scheme allows for identification of conservation areas as well as development areas.

2. Analysis-Synthesis

Many land analysis studies stop short of interpreting the data from research. Facts, such as total days of sunshine or numbers of deer, are meaningless unless interpreted in terms of importance to recreation. Although hard research data on these issues are scarce, certain judgemental conclusions can be drawn.

This step should reveal strengths and weaknesses of the interrelationships between factors. For example, the best waterfront areas for recreation may now be inaccessible or the capacity of the nearest community sewage system is already overtaxed. It shows how resources aggregate in favor of large recreational complexes or where a single resource suggests minimal recreational adaptability.

The step should be completed with a series of terse and meaningful conclusions concerning the reservoir's adaptability to a variety of recreational activities.

3. Concepts-Recommendations

From the research, analysis and synthesis steps, professional designers and planners can develop creative concepts for utilizing the resource areas best adapted to recreation and protecting those areas where recreation would be detrimental to the environment.

It may be desirable to greatly increase the capacity of some highways whereas other roads may need to be eliminated. Fragile resource assets that would be in heavy recreational demand may require special transportation systems such as aerial gondolas. Some areas may need to remain roadless.

The present infrastructure may be so inadequate to handle millions of visitors that an entirely new leisure city should be developed. In other
instances, only minor changes may be recommended.

From the data base, new attraction complexes can be designed. Where resource strengths cluster, such complexes have greater assurance of success than at inferior locations. Locations for the three basic types of complexes for reservoir recreation--water, water's edge, and vicinity--can be delineated.

With sound environmental information in hand, advertising and promotional programs that do not encourage misuse of resources can be developed. Greater credibility can be built into such campaigns because they can deliver the appeals promised.

The most popular criticism of planning is that plans are seldom implemented. This reveals a striking difference between planning as an ongoing process--a verb--versus planning as a document--a noun. Some parts of the basic planning document may not have to be repeated but implementation must be a continuing process.

4. Development-Protuction

This final step is really a statement of overall objectives. It denies the polarized positions of either wanton exploitation or rigid preservation.

Some might prefer that a new agency be created to carry on the area-wide task of planning and regulatory control. Others might prefer that all land development surrounding the reservoir be prohibited entirely.

I would venture the opinion that both of these positions sidestep the issue. I doubt if the people of Texas and outside visitors will stand for prohibition of recreational use of reservoirs. And, somehow I have little faith in some new agency providing the solutions to problems already complicated by a multiplicity of decision-makers.

Instead, I would like to suggest that we already have the authority and
the people with the know-how for bringing reservoir recreational development into some balance with the environment. If, on a voluntary basis, representatives of three groups could be brought together and could assume the challenge of creating a recreational-environmental balance, I am confident that they would find the means to do so. What three groups? (1) Decision-makers (park officials, investors, developers). (2) Planners (public and private professionals). (3) Environmentalists (ecologists, biologists).

The action I am describing is problem-solving by collaboration and cooperation rather than by legal coercion. Although we have only sporadic evidence that this can succeed, let me give you a few illustrations. Although these three are not reservóirs, they may serve to illustrate the point.

Mission Bay is a very popular and successful recreational complex in San Diego consisting of over 4,000 acres of mixed water and land uses. Over $40m. each have been spent by private agencies and by private enterprise. Included are many public beaches and waterfront areas together with many hotels, resorts, restaurants and marinas. The dredging of the waterbodies and converting of the marshes to land were done by the Corps of Engineers.

In the state of Hawaii, no legislation is passed and no major investment is made without the tacit approval of the Oahu Development Conference. This is a citizen's organization run by a board of directors of 40 key influentials—those who make the major business, industrial and social decisions. Although they came into being too late to stop some of the shoreline congestion, such as at Waikiki, they have recently made great strides in protecting Hawaiian—environmental assets of that tropical paradise.

Our own very popular Texas attraction—the San Antonio River Walk—is the result of collaboration and cooperation of at least six major agencies and organizations. Our study of urban river development across the country is
showing that many cities are waiting—just sitting on their hands—until some magic organization assumes a responsible role. In San Antonio they did not wait—they made it happen.

In my opinion, because Texas reservoir areas are dominantly recreation areas—both socially and economically—they should be planned and managed for recreational functions as well as other basic functions. Both the economic area and the reservoir watershed should be included. We need not wait for some new planning and management agency or authority. It can be done—and I argue it must be done—if we are to prevent the resource degredation that is mounting rapidly in these very critical areas of Texas.
REFERENCES


Gunn, Clare A. a 1972. Tourism Resource Planning in East Texas. Recreation and Parks Department, College Station: Texas A&M University.


