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COMMUNICATION: A HUMAN FACTOR

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Quite as much as the management of wildlife itself, wildlife management involves human factors (Schoenfeld 1957). Gabrielson (1941) saw that "the most uncertain factor (in wildlife management) is not management (of wildlife) itself" but "public support for a suitable and effective program." Gordon (1944) noted this "human element - the public relations problem" in wildlife conservation. Leopold (1946) wrote near the close of his career that "a conservation commission can operate up to the level of public opinion, but finds a drag when it attempts to proceed beyond that point." A 1973 North American Wildlife and Natural Resources Conference session and a resulting book were devoted to research reports on "human dimensions in wildlife programs" (Hendee and

Schoenfeld 1973).

Nowhere in wildlife management are the human factors so crucial as in the management of wildlife on private lands. As with conservation in general, wildlife management on private lands is not exactly proceeding by leaps and bounds. The usual answer to such a dilemma is, as Leopold (1949) said, "more conservation education," or, as Madison Avenue might call it today, "ecological persuasion."

THE PROBLEM ENVIRONMENT: VALUES IN CONFLICT

Before looking at lessons in the pitfalls and possibilities in communication, education, and persuasion from other fields that might be applicable to wildlife

management on private lands, it is appropriate to examine the deep-seated values that are inevitably in conflict in the management of wildlife on those private lands — value conflicts that impinge markedly on any education/persuasion program.

The Sanctity of Private Property

At the outset is the American commitment to the sanctity of private property. Only a last-minute change caused the Declaration of Independence to speak of “life, liberty, and the pursuit of happiness” rather than “life, liberty, and property.” In any event, the pursuit of property became synonymous in many American eyes with the pursuit of happiness. It was a principal means of assuring that all men were indeed created equal, at least in the opportunity to pursue money, a pursuit Smith (1980) puts at the heart of American culture. Brought to America by the earliest European settlers, the concept of land ownership bestows on the individual the right to acquire, hold, develop, farm, use, lease, rent, sell, grant, will, or exercise any other lawful right over the land owned. Until very recently, the landowner’s only direct obligation to the public was not to maintain a nuisance. Hence, for society to exercise much leverage on wildlife management on private lands has generally been considered somewhat “un-American.”

The Hunting and Fishing Subculture

Running hard up against the sanctity of private property is the American hunting and fishing subculture, again partially an import from Europe. After the battle of Runnymede in 1215, the victorious barons exacted from King John the famous Magna Carta, which

included among other reforms a decree that the king held all wild game merely in trust for the people. By 1500, when unregulated hunting and fishing had conflicted with private property rights, King Henry VII forbade the taking of game on other people’s land without the permission of the owner. The colonists who settled America carried with them the English Common Law concept that “while the state has an ownership of the wild game within its borders, no other person has a right to go upon private property to take game.” In the wide-open spaces of America, however, with its vast public domain, it was difficult to tell what was private property and what was not. Hence, public hunting and fishing on private property became common practice, if not the rule. Modern “No Trespassing” signs have made only a faint dent in the tradition. So the private property owner lacks full incentive to manage the wildlife which he or she does not own and which he or she must share with intruders. Even in the absence of trespassers, the private property owner cannot always keep his or her wildlife at home; the quail he or she husbands in winter may nest on someone else’s back forty.

Overlapping Jurisdictions, Competing Responsibilities

The overlapping jurisdiction of the states and the private owner with respect to wildlife on private lands has become further complicated by the role of the federal government with respect to migratory waterfowl, and by the role of both the states and the federal government in maintaining wildlife refuges and public hunting and fishing grounds adjacent to private property. While a Dodge County, Wisconsin, farmer is the acknowledged

owner of his corn field, for example, foraging geese from the Horicon National Wildlife Refuge that frequent his field in fall and spring are wards of federal and state governments that are in uneasy liaison over goose management. Were the farmer's corn to be so managed, a second Shays' Rebellion would probably result. That he tolerates the public's geese is testimony to a quirk.

While undertaken with the best of motives, the role of municipalities, states, and federal government in setting aside and managing various direct or indirect wildlife havens – parks, forests, refuges, reserves, arboreta, scenic rivers, soil and water banks, outdoor recreation areas, land management districts, wilderness – may have diluted to some extent any private impulse toward wildlife conservation. Just as a public welfare system has largely replaced private philanthropy, perhaps many private property owners are quite content to let George Washington or Westchester County do it. After all, they may say, it is our tax dollars that support public wildlife welfare programs; why should we compete with the professionals? Meanwhile the professionals themselves have concentrated almost exclusively on managing wildlife on “their” public lands.

The Market Reward and Land Management Agency Systems

That “ownership” of his or her wildlife is suspect places wildlife in a unique position in the eyes of the private property owner, who otherwise operates in a market-reward system that allows him or her to exploit his or her resources in the typical American way. Not only is the landowner otherwise given relatively free reign to exercise his or her initiative to

make maximum profits, he or she is subsidized in various overt and covert ways so to do. A Dodge County, Wisconsin, farmer, for example, could rely on federal funds to support his milk prices, to underwrite loans at reduced interest rates, to reimburse him for growing more, or less, corn, depending on the times, and perhaps to feed his schoolchildren a hot lunch. But only in a very few indirect ways does either the market-reward system or society encourage him to manage wildlife. On the other hand, at the elbow of our Dodge County farmer are various state and federal land-management agencies whose agendas tend to feature mono-commodity goals rather than the broad ecological principles of land management that must undergird wildlife conservation. A card-carrying county forester, for example, may advise our farmer to eliminate the “wolf” trees in his woodlot to “free up” commercial trees, when it is those old den trees that harbor squirrels and pileated woodpeckers.

To be sure, in places it is economically, socially, and politically acceptable for a private landowner to make some kind of a profit on his or her wildlife. A Dakota farmer, for example, can lease his wetlands to the government as duck-breeding habitat. A Pennsylvania lumber company can lease its forest to a consortium of deer hunters. In eastern Washington, most of the hunting rights have been bought up by upland-bird hunting clubs. But it is by no means clear the leasee in such cases feels any obligation to practice wildlife management.

Free Media and Audiences

Most of the media of education and communication to which the American private-property owner has access are

"uncontrolled." That is, they are established to be as independent as possible from coercive agencies or movements. A state press or a mandated school system, for example, are alien to the American temper. Just so is the American private-property owner himself or herself a free-audience agent. He or she cannot be "programmed" even to attend to a particular message or series of messages, much less to adjust his or her attitudes and behavior to a prescribed course of action. Americans traditionally cherish this independence.

LESSONS IN PERSUASION

All this is to say that any attempts to educate or persuade others with respect to wildlife management on private lands take place within a congeries of historical, psychological, and social factors, most of which are not amenable to simple manipulation. What is more, lessons to be applied from the field of human persuasion are indistinct. In fact, communication scholars and researchers have been discouraged from carrying out much persuasion research lately, primarily due to a lack of evidence linking messages with persuasive intent to any long-range change in audience attitudes and, especially, behavior. But there are some points of departure and some points of guidance.

What Research Tells Us About Communication of Technical Information

While informing private land owners about the methods and attributes of wildlife management on their property may, as we have seen, be considerably concerned with the "affective domain," that is, with their "feelings about" the

subject, there will undoubtedly be in any such messages a strong element of the "cognitive domain," that is, with knowledge of the subject — "the facts in the case." Communication of technical information to non-experts is a field that is incompletely researched and understood, unfortunately lacking systematic, cohesive programs of investigation, carefully building upon each other. Nonetheless, Bowes *et al.* (1978) and Grunig (1979) have compiled invaluable bibliographies of what seems to be known. Practical advice, perhaps applicable to wildlife management on private lands, can be extracted from the research they reviewed, if one is willing to allow some extrapolations and elaborations, and accept for now a certain lack of precision.

(1) Owners of private lands are by no means a monolithic "public." The dairyman, the tree farmer, the recreational property owner, and a nature conservancy consortium may all be neighbors in the same township, but each may approach the matter of wildlife management on their lands from quite different perspectives. It is necessary in such a case to differentiate audiences and communicate to each segment with messages addressed to each particular interest.

(2) Communication efforts should be spread over long periods of time. Short "campaigns" tend to differentiate the interested from the passive, leading in many cases to a well-informed minority but not to widespread awareness. There is actually the possibility of increasing rather than decreasing a "knowledge gap" in that informationally "rich" members of the public get informationally richer while the informationally poor stay the same.

(3) An individual's ability to perceive "control" in a situation has much to do with how he or she evaluates pertinent information. The more one has feelings of

personal control or efficacy, the more likely one is to "try something." Communicators need to acknowledge the particular problems they have in this respect in regard to wildlife management on private lands. Devices such as advisory committees sometimes can help alleviate feelings of lack of control on the part of private citizens.

(4) "Situational constraints," such as proximity to state or federal lands with their own disparate approaches to wildlife management, frustrate efforts to communicate with a homogenous audience in mind, or even to assess public opinion in a clear fashion.

(5) The difficulties biologists, managers, and technicians have in communicating directly with the public, and perhaps more importantly in mutually satisfactory relations with reporters/editors, should be recognized early by those responsible for explaining wildlife management on private lands. In-house communication help in preparing materials would seem to be a useful step in lessening gaps and friction between professionals and their lay audiences (See Griffin 1977b)

(6) The intent of much wildlife management information to create favorable responses among private landowners cannot work in ignorance of the powerful values in conflict we have already discussed – conflicts that restrict an owner's freedom to change. Remember, too, that a person's values are usually reinforced by his or her friends – yet another restriction on change. By speaking realistically to what one individual can do within real or imagined constraints, the effectiveness of the message may be enhanced, perhaps along with the individual's feelings of efficacy.

(7) There is a strong possibility that

some polls seem to create opinions for people to hold, and in some cases even suggest an opinion rather than measure the opinions people have. This hazard must be taken seriously by those investigating public attitudes and problems in wildlife management on private lands. Polls done in ignorance of the "contamination" possibility may confuse real public opinion with results that merely echo attitudes of the sponsoring agency. At a minimum, survey respondents should be given "unloaded" questions and be provided the opportunity to reply that they in fact may have "no opinion" on certain matters. Better yet, polls should allow respondents to plead ignorance of a matter, without ostracism. What people *don't* know can be enlightening.

(8) Research into "readability" supports the use of the traditional rhetorical devices taught in English composition classes – simple words, short sentences, relating the unfamiliar to the familiar, graphs, charts, illustrations, example, parable, and, in particular, metaphor. The more "passive" the use of the message on the part of an audience, the more important are such "readability" techniques. However, the recipient who perceives a "functional" use for the message can apparently overcome gross lack of readability, especially if the expected value of the information is greater than the cost of the work to obtain and decode it. Illiterate Chilean peasants, for example, have been known to walk miles to find someone who could translate an agricultural bulletin the peasants assumed to be of practical use.

(9) Administrators play a key role in successful public communication by technical agencies. Some administrators are adept at communicating technical information; others muddy the waters.

Professional communicators of technical information themselves can be “co-opted” by the agency “system,” losing touch with lay audiences.

(10) Of paramount importance is the consideration that what an audience brings to a message — that is, the reason they pay attention and what they expect the message to provide — may have more to do with what an audience member carries away from that message than does any characteristic of the message itself.

The principles just distilled from Bowes *et al.* (1978) and Grunig (1979) are at the heart of most successful advertising and public relations campaigns. But blind, prescriptive acceptance of such strategems ignores the slim, situationally-constrained bases upon which much of the strategy has been developed and tested. Wildlife management on private lands is, in so many regards, such a unique problem that communication of technical information about the subject may require experimental approaches, properly evaluated.

Science Education Perspectives

Writing from the somewhat related perspective of science education, Lucas (1980) has made an exhaustive review of the empirical literature and concludes that “evidence that attitudes lead to appropriate behaviors or actions is not strong.” He particularly emphasizes that private environmental attitudes are independent of public environmental attitudes and may be more difficult to change. In studies of family planning, for example, a majority of members of Zero Population Growth who argued that the United States had passed its op-

timal population size, and who preached that a single-child family was required for immediate stabilization of the population size, nonetheless intended to have *two* natural children themselves. An anecdote further illustrates the point: a bumper sticker reading, “Save the Whale: Boycott Japanese Goods” — on the back of a new Toyota!

While knowledge about an environmental condition is probably a necessary condition for appropriate action, it is not a sufficient condition. Knowing that a stream is contaminated by winery wastes which increase the demand for oxygen in that stream will not guarantee that the producer, regulatory authority, or public groups will act to restore the stream to pre-industry condition. Indeed, Lucas (1980) cites evidence that general public support for environmental measures may fall off as people learn more about the specific nature of the issues involved and interpret the proposals for restriction as possibly harmful to local community interests. Studies also have found that secondary school students in Australia, England, and the United States have positive general environmental attitudes — except when the object of concern impinges on their own lives.

Because general attitudes about the environment may not translate into specific attitudes about specific issues, Lucas (1980) suggests that “perhaps we ought to concentrate on the direct modification of behavior rather than on intervention at the attitude level.” Such an approach can raise questions of ethics, however.

Ross (1980) offers an important *obiter dictum*:

“True, there is very little evidence that attitudes and behavior are related in a predictable way. Perhaps that is because

we don't ask the right questions or the right set of questions, rather than that behavior is fickle. There is obviously a fundamental relationship between attitudes and behavior. It is also obvious the relationship is dynamic rather than static. Perhaps many social scientists still expect the relationship to be deterministic (cause and effect) in the narrowest sense, when, in fact, behavior is stochastic (random within certain boundaries and patterns). We simply do not always behave the way we should if we were market-oriented. Such is not irrational; it is simply that we don't have an accommodating theory as crisply defined as we do for market behavior. What we need to do is to expand the definition of 'value,' and as we do, I believe we will come out with strong theories that will explain the undeniable relationships among attitudes and behavior."

What Instructional Message Design Research Tells Us

Fleming and Levie (1978) have performed an admirable service in distilling from many researches in the behavioral sciences certain principles applicable to the design of instructional messages, although at the outset the writers emphasize that while the principles can inform the creativity of designers, science has not replaced artistry and intuition. Remember, too, that behavioral science is based much more on probabilities than on deterministic laws – more like rough outlines in sand than like chisel-cuts in stone.

Perception is a complex and active process by which we receive or extract information from the environment. It is a far-from-perfect process; witness the rarity of the so-called "photographic memory."

As a normal course, a lot of loss or editing of information goes on in our minds without our being conscious of it. Perception is constrained and selective: limit the range of aspects presented. Perception is organized: make apparent the organization of messages. Perception – and knowledge – are relative: hence provide anchors or reference points to which new information can be related.

When addressing *attitude change*, Fleming and Levie (1978) concede that there is considerable question whether information-versus-propaganda and teaching-versus-persuading can be validly discriminated. Whatever, it is clear that expectations and attitudes impact upon perception and learning. Expectations and attitudes may affect perception through vigilance (people are often on the lookout for things that reinforce or gratify), or through distortion (people sometimes misinterpret objects and events to be consistent with their expectations and attitudes). Similarly, people often learn and retain information which agrees with their attitudes better than they learn counter-attitudinal information. counter-attitudinal information.

While a great deal seems to be known about how people modify their attitudes, attitude change is an extremely complex process in which numerous factors interact. Yet, given that a receiver is not committed to a hostile viewpoint, given that the nature of the situation and group pressures do not preclude change, and given that the communicator can engineer the perception and comprehension of the message, it is not unreasonable to expect that the use of appropriate designs could add to persuasive effectiveness, given other contributing factors. But as to which designs are to be employed by which persuaders in which situations to

which audiences, Fleming and Levie (1978) offer "no magical solutions." Research into the compatibility of message design with human informational needs is still developing (see Ray and Ward 1976; Griffin 1980).

What Experiences in Technology Transfer and Human Behavior Tell Us

Few fields of communication research have been as thoroughly tilled as that of what has been called "innovation diffusion" and what is now called, in some circles, "technology transfer." Originally developed to try to explain the adoption of hybrid corn seed by Iowa farmers, this perspective has been employed in such diverse areas as education, marketing, health, and defense programs. The basic findings may be applicable to natural resource management. Muth and Hendee (1980) have recently summarized what seems to be known about the classic diffusion-adoption model.

An important factor accounting for different adoption rates is the nature of the innovations: relative advantage, compatibility, complexity, trialability, observability. For example, wildlife management on private lands is incompatible with some deep-seated owner values and needs; it is complex; its trialability is not simple; and its observability is long in coming.

Five stages are generally recognized in the decision-making process of individuals. In an *awareness* stage, an individual is first exposed to an innovation idea. In an *interest* stage, the individual may seek more information about an innovation and consider if and how it applies to him or her. Individuals who progress to an *evaluation* stage make a mental applicability of the innovation, weighing the be-

nefits and costs, complexity, trialability, and other considerations. Some individuals next move to a *trial* stage in which they actually experiment with the innovation. Trial leads either to *adoption* or rejection or something in between.

According to the model, diffusion within a social system typically is distributed among various types of individuals: *innovators*, the venturesome; *early adopters*, respected community models; *early majority*, the deliberate; *late majority*, the skeptical; *non-adopters*, laggards, or defenders of tradition, depending on one's point of view.

The mass media can be effective in stimulating awareness. Specialized media serve the interest stage. At the evaluation stage, interpersonal communication appears to be necessary – consultation with friends, neighbors, peer contacts, and such "change agents" as extension personnel and salespeople. Personal contacts likely are important in the trial stage as well. (For a perhaps over simplified example of a change agent supposedly at work in the interest-trial-adoption process, one can consult a typical beer, detergent, or pill TV commercial: "Well, I'll be darned. Brand X does (taste, clean, cure) better. I'm going to switch to (Suds-Lite, Suds-All, Suds-San)").

The social system of which he or she is a part defines a range of tolerable behavior for an individual and substantially dictates the effectiveness of diffusion and adoption strategies. Traditional norms mean a negative attitude toward change; they can be a nearly insurmountable barrier to innovation. Modern norms favor change, and make innovation acceptable. Most people belong to several social systems, which may or may not be compatible.

This tour of the sociology of technology

transfer emphasizes that success depends heavily upon the characteristics of the innovation as well as on the social system of which the potential adopter is a part. The transfer process, according to the model of diffusion, is essentially a rational one, and cheerleading is no substitute for knowledge of the innovation and the constraints in the path of its adoption. A successful trial must be initiated by what the particular society sees as a credible practitioner. Once "opinion leaders" have become involved in the process, the process cannot be controlled, since those leaders can transmit their ideas and opinions to their peers in the social system, who in turn may transmit their ideas and opinions. Thus it is important to be certain that an innovation is ready for trial before advertising it. Communication of this kind through mass media is of greatest utility when tied to inter-personal communication. Individuals who can communicate new ideas to identified opinion leaders are essential. Creating an effective system of these "linkers" might do as much as anything to speed enlightened natural resource management. So might the involvement of publics in biological or social research problems so they share "ownership" of resulting innovations and thus, in some measure, a responsibility for their implementation.

Information diffusion leading to technology transfer assumes large numbers of individuals making rational decisions, in terms of the market, that will benefit the adopter. What would be the rate of adoption of constraints on or regulation of behavior in a situation where government decides to force abstention? We don't know, yet constraint, with some alleviation of the consequences of restraint, might be the most effective way to get desirable wildlife management on private

lands (Ross 1980).

The diffusion model is controversial, and at least one scholar (Chaffee 1975) has observed that the classic curve of diffusion in society, plotted against time, is simply a normal ogive, representing randomness rather than process, departures from this curve — accelerators and decelerators, for example — are the matters of real interest. Thus we can recommend only caution in any simplified application of the technology transfer model.

Identifying who the opinion leaders are, for example, is not an easy task. The Yellow Pages have yet to list anybody under such heading, and research shows them to be an ephemeral lot. In their review of the literature on opinion leadership, Severin and Tankard (1979) note that opinion leading depends on topic and time, so that who leads and who follows depends a lot on the subject matter at hand. Thus we are concerned primarily about identifying those whose potential influence concerns matters such as agricultural or land use practices among a circle of acquaintances at the time. Empirically, opinion leaders are often identified through self-reports and nominations from others, the best method being to triangulate the results of at least 2 reliable identification strategies.

Research has also revealed some characteristics which point to the role of opinion leaders within primary groups and also serve to distinguish them. Opinion leaders first of all tend to be perceived by their followers as personifiers of values held in high esteem by the group, such that others wish to emulate them. Severin and Tankard (1979) note that people do tend to associate with others like themselves, and the sharing of influence in primary groups functions primar-

ly to maintain the similarity of opinions' and behavior within that group. (Influence has been found to be bi-directional to a great extent, resulting in more opinion-sharing than opinion-giving, at least regarding public affairs matters.) The leader is also perceived by followers as competent and knowledgeable in the subject matter, and usually occupies a strategic niche among circles of acquaintances, so that he or she is accessible to others within the group and has some valuable contacts outside the group – including specialized media – which can be tapped for special information on topics important to the group.

In regard to diffusion of innovation, a peculiar circumstance is interwoven with the process so that there is often a certain dissimilarity (or heterophily) rather than similarity among individuals who interact. Severin and Tankard explain that “new ideas often come from people who are quite different from the receiver,” which presents some barriers to effective communication, since the source and receiver may not share attributes such as educational level, values, beliefs, or social status. Such differences need to be taken into account in designing information and education programs regarding innovative wildlife management practices on private lands.

Above all, reason must be our guide; experience may deceive us. For instance, it may not be possible to utilize the network of “county ag agents” now in place, for they may be too wedded to promoting agricultural practices that are in fact deleterious to wildlife husbandry. What is more, we have to remember that introducing enlightened wildlife management on private lands may involve alienating land practices rooted not just in Old World traditions

but in the assiduous work of relatively recent specialists in “technology transfer.” How, for example, do you persuade a proud exhibitor of “clean” farming to return to an age of untidy fencerows, especially if his friends support his present behavior? How do you switch a lumber company adherent of selective cutting to the concept that some clear-cutting or (horror of horrors) controlled burning can encourage game species of wildlife? Or how do you convince a recreational property owner weaned on “keeping the cows out of the woodlots” that light grazing can actually be salubrious for creatures of edge? On such questions there is inevitably confusion of communication counsel, and only the most uncritical minds are free of doubt. Technology-transfer experiences in underdeveloped countries may supply some answers.

What Communication as Complement in International Development Tells Us

Under the aegis of the Agency for International Development (AID), battalions of American specialists in technology transfer took off throughout the world to introduce all manner of innovations, armed with the belief that communication could bring about economic development. They have filtered home sadder but wiser, having discovered that it is economic development that creates a need for communication. Grunig (1979), for example, observed personally in Columbia that constraints were so strong in that underdeveloped country that few peasants had the latitude in their behavior to make use of technical information or to adopt innovations. Large landowners, in contrast, were faring quite well economically

using traditional agricultural practices and recognized no need for change. Hornik (1980) has recently summarized what overseas experience has taught us about the strengths and weaknesses of the technology transfer model.

While it seems to be true that communication technology, when used directly in an educational process, can provide a backbone to both organize and maintain change in a resistant environment, and while it seems to be true that taking advantage of the special qualities of a variety of media through carefully designed software may enable the development of a different instructional process equal to face-to-face instruction, and while it seems to be true that communication technology can magnify the ability of a population to speak to the central institutions which affect them, nonetheless, if we have learned anything it is the importance of ripe circumstances, of right context, of making communication activities fit as a complement to other activities, and that communication interventions must complement or be accompanied by changes in resources or environments. The most repeated conclusion of development researchers interested in persuasion via mass media is that effectiveness is magnified by complementing media messages with local audience groups organized for listening, discussing, and deciding.

In sum, while communication technology can take many roles in development, its success in those roles depends on how it is done and in what circumstances. Hornik's (1980) message is one of caution and of a field not yet mature. On a more positive note, experience with the innovation diffusion model both here and abroad may

suggest that something like the Cooperative Extension Service or the Forest Service Cooperative Forestry Program, linking the U.S. Department of Agriculture, landgrant universities, and county groups, may provide a communication model for achieving enlightened wildlife management on private lands, when accompanied by enlightened public relations.

What Research in Environmental Public Relations Tells Us

There is occasional evidence in research literature that a public information program can in fact produce a particular public action. Chaffee and Ward (1968), for example, presented evidence that a newspaper campaign had helped sell a school bond issue in a small community. More recently, Schnelle *et al* (1980) report on a newspaper campaign that seemed temporarily to reduce litter in a small city. But the overwhelming evidence offered by Grunig (1918), in a thorough review of the literature of environmental public relations research, was to the effect that attitude change is rarely if ever achievable through short-term communication efforts, and that attitude is not necessarily a predictor of actual behavior. For example, Chaffee and Linder (1969) came to believe that while a person's evaluation of an attitude object may be influenced through information processing, those effects do not necessarily carry over to corresponding changes in the person's directed behavior toward the object.

Public relations research does generally show a positive relationship between communication exposure and level of knowledge; the causal order is not really clear, however. But research also

suggests that level of knowledge about a resource management issue may be *inversely* related to an ecological attitude on that issue when economic self-interest or some other stance intervene.

While environmental information alone simply will not necessarily change behavior, media amplification is not without consequences in some cases; new information may reinforce a pre-existing attitude. For example, people with a strong anti-pollution attitude may change their attitude toward a particular product as a result of information that the producer or product is a serious polluter. Once the new information has been accepted and integrated, basic attitudes may shift a degree, and an even more extreme piece of information becomes acceptable, and so on. Deliberately to orchestrate such a staged campaign raises significant ethical questions, but mass communicators sometimes practice the strategy, by accident or design – and we gradually adjust to the notion that the Vietnam War is a nightmare, that Richard Nixon is culpable, or that the most endangered species is humankind itself.

Attempts at attitude manipulation have an inherent weakness: they presuppose that public relations is something that a person or an agency or an institution practices to get other people to do what the communicator wants them to do. Attitude manipulation has a simple appeal for agencies with a fixed model of how others should behave and who look on PR as a “quick fix” for eliciting that behavior. According to this approach, communications change attitudes which in turn program people’s behavior. Grunig (1978) calls this attitude model the “domino model” of PR. If we can just communicate with people, according to

the model, the communication domino will topple the attitude domino and that will topple the behavior domino. In fact, social psychology research suggests that such attitude models have little explanatory power. One message seldom leads to 1 attitude and 1 behavior. The dominos don’t always fall in the same direction. People have free will. They control to a large extent their communication, their attitudes, and their behavior. We cannot control all 3 with a quick PR fix.

Grunig (1978) has proposed a “situational” model. It suggests that the way a person perceives a situation affects whether he or she communicates about a situation and how he or she communicates. Four factors are involved. *Problem recognition* represents the extent to which a person recognizes that something is missing or indeterminant in a situation so that he or she stops to think about the situation. *Constraint recognition* represents the extent to which a person perceives constraints in a situation which limit his or her freedom to construct his or her own behavior. A *referent criterion* is a guide or rule-of-thumb learned in previous situations which a person uses with discretion in a new situation. *Level of involvement* is the extent to which a person perceives a direct connection with the situation.

All in all, on the basis of recent studies with his colleague Keith Stamm, Grunig has concluded that environmental attitudes and actions are “situational.” In other words, there is probably no such thing as a pervasive “land ethic,” any more than there is an all-encompassing “Christian ethic.” If such is indeed true, not even a member of the Sierra Club or of Friends of the Earth can be on the side of the angels on all issues concerning wildlife management on his or her private

lands. Just so, the most cash-crop oriented farmer can at times emerge as a dedicated wildlife conservationist on his or her lands. Practitioners of wildlife management public relations should thus be happy with a .333 batting average.

The Case of the Press vs. the Snail Darter

Natural resource managers frequently attempt to use the press to help gain public acceptance of management plans and policies. But the press has an agenda of its own, which may or may not coincide with that of the resource agencies. For example, "the use or effect of subject matter or the literary treatment calculated to arouse excited interest and emotional response" is a working definition of the "reader appeal" journalists seek in trying to sell newspapers to sustain a free press, and at the same time it is Webster's official definition of "sensationalism." So the professional newsperson inevitably flirts daily with annoying if not scandalizing the resource management community, and the resource management person may inadvertently play into the hands of the press. Such seems to have happened in the case of the celebrated snail darter versus TVA's Tellico Dam in 1972-1979.

A study (Glynn 1980) has analyzed representative press coverage of the Tellico Dam issue. "Sensationalism" was associated principally with the snail darter angle, and principally in turn with sources quoted in stories, not to newsperson interpretation. The conclusion: when resource management persons introduce a "splashy" angle into a resource management controversy, the response of the press is predictable. The case of the press and the snail darter recalls a classic case of the resource management community

over-playing its hand in a 1937 Grand Canyon archeological expedition staged by the American Museum of Natural History and promoted personally by the Secretary of Interior. The press willingly treated the event as "a great human-interest story," only to be accused by scientists of "crass sensationalism" (McGraw 1979). It is at least an open question whether environmentalists were wise to stake the reputation – indeed, the solvency of that movement on a confrontation that would pit a diminutive fish against the massive historic forces of industry, economics, conservation, and politics represented by the Tennessee Valley Authority, and in a press climate which would guarantee that coverage of any substantive issues would be inundated by the attention paid to the "excited interest and emotional response" inherent in the snail darter and its fate.

While recent national surveys (Griffin 1977a, Schoenfeld 1980) indicate the daily press is increasingly staffed with a cadre of environmental reporters that adapts professional responsibility and craftsmanship to the construction of a threatened environment as a social reality to which readers can relate, that same daily press will never be immune to charges of "sensationalizing" when presented with "a great human-interest story" by the resource management community. Significantly, the "Stop Tellico" campaign was a grass-roots campaign; the large national environmental and resource organizations and agencies lent only token assistance (Plater 1980). Seemingly, national conservation leaders were applying an old military maxim: if you are going to fight, pick a battleground favorable to your tactical capabilities and strategic objectives. They may have seen

in Tellico environmentalism's Vietnam.

Natural resource managers continuously face the challenge of discovering and explaining management options in an unemotional, objective, self-disciplined manner. When they do, the press will usually meet them half-way. If resource managers create "media events," they run the risk of losing virtually all control of the flow of public information.

What Recent Persuasion Research Tells Us

An American president is attempting to persuade citizens that they will no longer be able to use energy in the way they have become accustomed to; oil companies are attempting to persuade the American public that their profits are not excessive; the OPEC nations are hiring a public relations firm to persuade the peoples of the world that OPEC is not the cause of oil shortages. On this and many other issues various groups are expending a great deal of money and, ironically, energy in persuasion. So there is a magic persuasion button that a group can push to get its idea across, right? Wrong. Roloff and Miller (1980), in an exhaustive review of new directions in persuasion research, leave the reader with a potpourri of models but no cook-book recipes.

For example, while persuasion in a democratic society is by definition devoid of coercion, in actual practice a persuasive message is much more effective if it is perceived as having elements at least indirectly coercive. A carrot masquerading as a stick, in other words. The receiver's self-awareness affects the persuasion process, and the self-awareness depends on the situation. One's own thought rehearsal induces more persuasion than message-argument rehearsal. While

source credibility affects persuasion, people choose to participate in the process of persuasion with others who are most likely to satisfy needs and achieve goals which are most salient and important at the moment of choice; we choose as communicants in a given persuasive situation those people whose characteristics most nearly satisfy the criteria we have established for that situation. In other words, there is no flat answer to the question, "Would you buy a used car from so-and-so?" On whether *Homo sapiens* is essentially rational or emotional there is no agreement. Should the opposition try to get a zoning ordinance defeated by telling the city council about the potential loss of wildlife, or by pointing to the venality of the company wanting the change? Research results offer no clear-cut answers to such questions. Some research suggests that messages using relatively low intense language are more persuasive than messages arguing very intensely; other research suggests that the opposite is the case in some situations.

While the concept of persuasion has a clear and important focus in marketing, and while Madison Avenue invests significant amounts of capital in what are thought to be persuasive advertising messages, even the most sophisticated research has not been able to explain without equivocation how such information is processed within the framework of consumer problem-solving behavior. Apparently a great deal depends on whether or not the receiver is a "spectator" to or a "participant" in the process. For example, the popular conception that Great Debates play a pivotal role in presidential campaigns seems to be over-estimated.

It would be nice if Roloff and Miller (1980) offered tested 1-2-3 approaches to persuasion, but such is not the case.

While persuasion continues to be valued as an instrument of a democratic society, its practice remains an art and not a science. What one can say is that in the rough-and-tumble world of everyday social conflict, as distinct from the polite confines of drawing-room controversy, coercive potential determines the relative impact of most persuasive messages. Just what coercion can be applied to the inculcation of wildlife management on private lands has to be the subject of a different paper than this one.

What Research on Mass Media Effects Tells Us

In a current compelling overview, Chaffee (1980) has summarized some 40 years of research on the effects of the mass media. At the outset, he emphasizes we must distinguish among 3 broad types of media effects: first, effects that can be attributed to a medium because of its physical properties and the sheer time a person devotes to it; second, effects having to do with the reception of information, the modification of behavior, and changes in feelings, opinions, and intentions to act; and third, effects concerning the unit of observation — individual, interpersonal interaction, or the activity of a larger social system.

Content-specific effects of the media are the most pertinent to this paper. Attitudinal effects were once assumed to represent an intermediate in a fixed psychological process that led from the intake of raw information to the exhibition of corresponding overt behavior. Evidence has now accumulated that the direction of causation linking attitudes to knowledge and behavior is ambiguous. A change in a broad social attitude can produce subsequent changes in ex-

pressed information, and attitude changes can follow forced compliance with a new behavioral standard. "Effective" communication may even be that which encourages a stable attitude, as when the media perform a therapeutic role in calming an audience in time of disaster or in dampening potential community conflict. It has been observed that even though the media may not be especially powerful in telling people what to think, they may be quite successful in affecting what people will think about. The issues on which most problem-solving effort is likely to be expended are those that people consider most important; to the extent that the news industry influences which problems will be addressed, it also affects which may be ignored. While several studies have found a widening knowledge gap that can be attributed to varying media influence on the relatively well-informed and the non-informed, some studies also indicate the reverse — that media inputs can bring the less-informed sector up to parity. The conditions under which each of these patterns can be expected to occur are not clear. In the final analysis, it may be that the psychological processes that intervene between media exposure and its effects are the crucial variable. All in all, Chaffee (1980) is convinced that the mass media are indeed influential societal institutions, but our understanding of exactly how, when, and why awaits further careful empirical analysis.

A recent study of the level of marine knowledge on the part of Virginia 10th-graders showed that higher levels of marine knowledge were positively correlated with high viewing and recall of Cousteau specials on television and on reading and recall of *National Geographic* (Fortner and Teates 1980).

What Strategies of Environmental Interpretation Tell Us

Educators acknowledge it is a mistake to assume that behavior automatically will be modified as result of either knowledge gain or attitude change or both, or even that changes in knowledge and attitude are necessarily related. On the other hand, some research does in fact suggest that environmental education programs are associated with apparent knowledge gain, attitude change, and behavior modification. Cangelosi (1980) has recently synthesized such research under various strategies applicable to what the National Park Service terms "environmental interpretation." As with any areas of research, each of these models has its devotees and its detractors.

Reinforcement theorists view attitudes as a response, and like other responses: In their opinion, attitudes can be altered by changing rewards and punishments. They present data to suggest attitude change can be facilitated by novel or intense communication stimuli, by moderate fear appeals, by a punishment-oriented approach, by a factual approach, and by a reward in the form of a persuasive message with an explicitly drawn conclusion.

Functional theorists posit that attitudes serve certain functions for the individual: understanding, need satisfaction, ego-defense, and/or value expression; and that in order to understand or attempt to change a given attitude, it is necessary to understand the function or functions it serves for a person.

Cognitive dissonance theorists believe a state of tension occurs whenever a person holds two cognitions that are inconsistent. In order to reduce the tension, the

person may employ a number of tactics, including discrediting the source, misperceiving or misunderstanding the communication, or being especially attentive to consonant information only. Particularly, a person who is deeply committed to his or her point of view may only "hear" the side of the argument that supports his or her existing view; hence education often is ineffective that attempts to change deep-seated attitudes.

The issue of recycling might illustrate the cognitive dissonance model. Many people start recycling their cans, bottles, and newspapers not because they are really concerned about resource scarcity or waste disposal but because of some neighborhood pressure. But this motive does not sustain the inconvenience of recycling, so they go seeking information that will help resolve their dissonance, and they may wind up forming an attitude of genuine ecological concern. Beginning recyclers, then often become concerned because they recycle, not the other way around, and in such a phenomenon may lie the greatest value in otherwise-token campaigns.

Reactance theorists disagree with the cognitive dissonance concept. Instead, they believe that if a decision is irrevocable, or as the time to make a decision approaches, "pre-decisional convergence" can occur; that is, the subject will see two options as equally attractive. For example, faced with the inevitability of induction, a draftee may switch from conscientious objection to armed forces conformity. On the other hand, reactance supporters believe that when one's set of free behaviors is eliminated or subject to threat of elimination, there comes a drive to retain or re-establish the threatened or eliminated behavior. The reaction to the Volstead Act comes to mind.

In summary, in spite of the difficulty of the task, and in spite of varying concepts of what happens and why, certain educational approaches seem to be able to be employed which may have a potential for beginning to get people to rethink their positions on various topics. Just how such approaches might be applied to the private owners of wildlife lands, Kuperberg (1978) suggests.

What Experience in Reforming Private Land Use Practices Tells Us

The private landowner's irritability is rising over the legal hurdles which continue to interpose between land ownership and land use. Whatever mechanisms we use to protect wildlife, they must be equitable to succeed. There must be a give-and-get relationship between landowner and public. The land developer and the environmentalist can, together, find better solutions than those of the regulatory agency or court. So says Kuperberg (1978) after a decade of developing a constituency for the land and its wildlife – involved and informed individuals.

History has shown how the ownership and use of land perverted ecological functions, with increasing infringement on wildlife habitat. But wildlife will likely not be saved if the price is further unilateral loss of private land-use rights. The challenge of today is how to allow for both humankind and wildlife in private land use. Kuperberg's (1978) answer is by diverse means and by encouraging innovation, showing the value to humankind of wildlife and natural systems. We must lead, encourage, and commend, Kuperberg (1978) says, the private land-users and decision-makers whose actions protect natural systems. In short, we must make the enhancement of wildlife and its

habitat as exciting and challenging as it has always been to conquer, exploit, mass produce, and demolish.

The incentive Kuperberg (1978) offers is relief from excessive regulation, contorted codes, outdated ordinances, and leaky legislation. The public's power to grant such relief can represent significant cash benefits to private land owners who, he says, presently lose millions of dollars a year to zoning battles, building codes, labor contracts, and transportation laws which waste energy, resources, and time. The public's representatives can grant each measure of relief in return for an equal measure of guaranteed future for natural ecosystems. These tradeoffs can be initially accomplished through restrictive covenants, transfer of development rights, land banking, planned unit development, variance, special consideration laws, and other legal mechanisms already in existence. After successful land-use models are underway, legislation can be reconstructed to encourage further the spread of wildlife-sensitive land uses.

As an aid to widespread acceptance of such ideas, a method of assessing the real benefits to free enterprise and society in general is required – a conversion table and yardstick for measuring values to humanity in terms all can understand. Kuperberg (1978) suggests the elements for creating such a measuring device already exist: energy accounting and stress-benefit taxation.

Kuperberg (1978) offers a number of examples of his approach at work. The sequence he describes sounds remarkably like the innovation diffusion model: venturesome individuals who care, people who synthesize new solutions and then help make them happen, successful projects that will lead to duplication, codified broad public opinion represented by

changes in law.

A major deterrent to wildlife management on private lands is the present morass of access-liability-trespass laws. But help in that regard may be on the way (Jahn and McCabe 1980):

Findings from a 2-year study were released recently to help resolve problems associated with recreational access to private lands, liability responsibilities of landowners, and trespass. Results seek to 1) clarify and reduce landowner liability where public recreation is permitted free or for a fee on private lands, 2) prevent trespass and simplify its enforcement, 3) provide additional encouragement to landowners to make their properties available for public recreational use and, at the same time, 4) improve recreationist-landowner relations. A proposed model state act has been drawn up to help resolve the problems.

Critical evaluation of existing access-liability-trespass authorities and identification of potential values of the model act are now under way.

Economist Jackson (1980) has stated the overall conundrum succinctly: "We have evolved a system with the economic purpose of producing and distributing wildlife wherein bureaucracy manages populations, landowners and their representatives manipulate habitat, and still other bureaucrats regulate both private parties and agencies of government in terms of their influence on habitat and the environment in general." His unorthodox solution: "We ought to consider the establishment of private property rights and in some instances even monopoly rights for some wildlife species in some places."

What Wildlife's New Constituency Suggests

Peterson (1978) points out that during the 1970's we have seen the emergence of a new interest in wildlife; one that goes far beyond the traditional concern of hunters and fishers for the preservation of habitat, and one that differs even from the desires of so-called "non-consumptive" outdoorspersons for places and sights with which to restore their city-weary souls. As evidence of this new interest, consider the number and durability of the wildlife documentaries that have appeared on television since the past decade began. The 3 major networks do not contribute such time unless Nielsen ratings are measurable.

For whatever their motivations, millions of people in the United States have joined the traditional wildlife constituencies. They seem not to like humankind's continuing encroachment on wildlife and its habitat. For reasons apparently beyond logic or perceived self-interest, they seem to feel in their bones that there is something unhealthy or just plain wrong about further depletion of nature. An older, pioneer, indiscriminate enthusiasm for "development" has become tempered in the past decade by a skeptical questioning of human activities that crowd other species into an ever-shrinking corner. Old-fashioned "progress" seems no longer to be America's most popular product.

While this seat-of-the-pants environmentalism may lack inner coherence or biological rationale, innate integrated-resource-management insight is potentially a powerful force which, if informed and deepened, may help advance the wise stewardship of our natural heritage in its entirety. But the force is likely to respond

only to a truly ecological perspective on wildlife that will stress the function of *all* creatures in maintaining the health of our planet. For example, the majority of Americans in a recent survey (Kellert 1980) favor protecting wildlife even at the expense of jobs, housing, and similar development projects, but 60% oppose hunting just for sport or recreation, and more than 80% oppose hunting exclusively for a trophy.

Whether this new wildlife constituency will support Kuperberg's (1978) "give and get" formula for encouraging wildlife management on private lands on any significant scale remains to be seen.

What a Sociocultural Orientation Tells Us

Given the import of social relationships to an individual, some research has focused on the ways in which one's perceived relationship to others could modify behavior. As we have said, Miller (1980) observes that much persuasive discourse is at least indirectly coercive, relying on threats and promises, and their credibility. A lot of these attempts at friendly persuasion rely on a notion of social approval or disapproval of a given action as the primary form of indirect coercion. Such an approach, obviously, underlies many advertising messages for products ranging from dandruff shampoo to laundry detergent.

A sociocultural model of this kind is explained by DeFleur and Ball-Rokeach (1975), who note that variables such as an individual's organizational membership, work roles, reference groups, and primary group norms can shape overt behavior in ways relatively uninfluenced by personal predispositions. One function of groups, they note, is to provide members

with shared definitions of reality – including appropriate interpretations of phenomena and prescriptions of proper behavior – via consensual validation. The role of communication and persuasion, according to this model, is to give people "new and seemingly group-supported interpretations – social constructions of reality – regarding some phenomenon toward which they are acting."

Following from the model, the communicator can be in a position of getting around the consensual validation process by leading the audience to believe that some interpretation or behavior has been socially sanctioned by groups relevant to them. This approach would perhaps be the most effective in regard to "new" phenomena – ideas or innovations as yet culturally undefined regarding interpretation and behavior. In American society, note DeFleur and Ball-Rokeach (1975), "individuals are members of groups that are of significance to them, but at the same time the social organization patterns of such groups are sufficiently complex, contradictory, and heterogeneous so that modes of reaction to new issues are not uniformly prescribed." Thus information about acceptance of "innovative" land-use techniques by others important to the individual, and reports of their behavior, coupled with suggestions of social and cultural norms which would reinforce acceptance, could play a role in effective wildlife management on private lands.

What an Assessment of Today's Environment Tells Us

Schoenfeld (1980b) has summarized the results of a number of recent polls and expert assessments that all suggest a public commitment to environmental protection seems to have been consoli-

dated by the majority into an American value of some durability. For example, for many young people participating, Earth-Day was not a momentary fling but an introduction to life careers in environmental action. Drawing on a survey of such environmentalists themselves, Mitchell (1980) believes environmentalism seems destined to a continued role as a reformist movement which harbors a vision of an "appropriate" society but which presses for reforms that are *neither too deep nor too left* to alienate either its middle-class constituency or its potential allies among the less affluent members of society.

This doctrine of reasoned environmentalism was expounded 30 some years ago by a wildlife ecologist. Aldo Leopold (1947) said: "The practice of conservation must spring from a conviction of what is ethically and aesthetically right, *as well as* what is economically expedient." He did *not* say, "*regardless of what is economically expedient.*" Leopold went on to explain: "A thing is right only when it tends to preserve the integrity, stability, and beauty of the community, and the community includes the soil, water, fauna, and flora, *as well as people.* He did not leave *people* out of the equation.

DISTILLING WHAT WE KNOW INTO GUIDELINES

Communication as education takes place within a congeries of factors, most of which are not amenable to simple manipulation. Attitude change is rarely if ever achievable through short-term communication campaigns, nor is attitude usually or necessarily a predictor of actual behavior. Ecological cognitions do not necessarily lead to an

ecological conscience nor to ecological action. Although the mass media may stimulate awareness of ideas, most human behavior and attitudes are rooted in an individual's social ecosystem. The most-repeated conclusion of researchers interested in persuasion is that effectiveness is magnified by complementing media messages with local audience groups organized for listening, discussion, and deciding. Thus a cooperative adult-education mechanism, linking federal and state instrumentalities with county groups in an essential 2-way flow of communication, may provide the best single model for helping to achieve wildlife management on private lands. If there could be a measure of covert coercion associated with the communication, its chances of persuasiveness would seem to be enhanced.

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