Natural Design in Development: Promoting a Team Approach to Environmentally Sound Development Design

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Abstract: In Maryland, human populations are increasing and are accompanied by increasing land development. In response, state and local governments have enacted environmental laws and regulations to limit impacts on wetlands, forests, and the Chesapeake Bay. Communication among development, land planning, and natural resource professionals during the development design process could enhance regulation by helping to insure designs meet requirements and consider impacts of development on wildlife habitats not protected by law. This communication seldom occurs. In response, the Maryland Department of Natural Resources created Natural Design in Development (NDD), a series of conference/workshop sessions which trained these professionals to communicate more effectively with each other during the design of a residential development site. Five regional conferences in Maryland attracted over 600 participants. Results of the effort were not quantified. However, NDD has implications for helping other state wildlife agencies open channels of communication between wildlife professionals and the development industry.

Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 47:775–782

Human population growth in the Chesapeake Bay region is expected to expand by 2.6 million by the year 2020 and will be accompanied by the development of residences and work places to accommodate the newcomers. From 1950 to 1980, the number of developed ha per person had increased from 0.06 to 0.26. The conversion from undeveloped to developed land has occurred faster than the population growth. For example, between 1970 and 1980 in Maryland, the population increased 7.5%, while developed acreage increased 16.5%. This human population growth and subsequent land development has lead to the loss of about 9,720 ha of wetlands in Maryland from 1955 to 1978 (Year 2020 Panel 1988). Forests have also declined, particularly in the counties surrounding the Baltimore-Washington Metropolitan Area.

These losses have inspired lawmakers in Maryland to initiate growth management laws which act on a landscape level. Maryland also has implemented laws

restricting development along the shores of the Chesapeake Bay, in forests and wetlands. However, environmental regulations tend to emphasize compliance with regard to specific aspects of a site and not a holistic approach to site design.

The design approval process, which often begins before a design is finished (Gawel, pers. commun.), is set up as a win or lose situation where local planning regulators hold the key to approval, rejection, or negotiation. Projects are approved or rejected on the basis of information about the site which is known to the planning regulator (not necessarily all the information there is to know about the site) and on whether or not the designs meet regulations (Dorius 1993). Therefore, designs which meet environmental regulations do not always protect or enhance wildlife habitat which may not be protected by law (Butler 1993).

The effects of development on wildlife habitat on a local scale were illustrated by a study done on the effects of development on bird populations in Columbia, Maryland. This study indicates that residential land development results in a local loss of diversity of bird species (Geis 1974), which would indicate a loss of diversity of habitat.

How can a development project mitigate its impacts on wildlife habitat already present on site? Can a development company use wildlife habitats protected, enhanced, or created on the site as a selling point for buyers? Can engineers work with the hydrology of a site to minimize grading and clearing of land? Can landscape architects find hardy, native plants to replace or enhance habitat? How can land planners and regulators work with developers to reward environmentally sensitive designs that meet county requirements? These and other questions, applied to the design process of a project, need to be answered before wildlife habitat can be successfully integrated into a development site. The answers to these questions require the input of all affected professions. In particular, natural resource professionals need to be more involved in the development process.

The Maryland Department of Natural Resources (DNR) recognized the impacts development has on wildlife habitat and took steps to provide technical assistance to development projects, particularly in response to a law restricting development along the Chesapeake Bay shoreline. During these efforts, DNR foresters and wildlife biologists found that there was very little communication occurring among the various professionals involved in the development process and, therefore, very little information shared about the hydrology, wildlife, forests, and other environmental aspects of a site.

Many wildlife biologists were not familiar with the development process and so were not in a position to address wildlife habitat impacts in this context. At that time, foresters were involved in the development design process more frequently than wildlife biologists but even their involvement was often peripheral.

In response to these issues, the DNR initiated and completed a series of conferences and workshops, attempting to bridge the gap between key land use players: developers, engineers, landscape architects, surveyors, planners, biologists, and foresters. This program was called Natural Design in Development (NDD) and was attended by over 600 professionals in total. By bringing all of

these professionals together to the same conference and workshop, NDD hoped to illustrate the benefits of cross-communication and cooperation at the design stages of development projects, including gathering all information about a site before putting pencil to paper. We attempted to illustrate that information on wildlife species and habitats, hydrology, forests, wetlands, and other natural aspects should be completely researched. Our "hypothesis" was that, without all site information available to the design team, some professions would find it difficult, if not impossible, to participate in the design process.

Conference Overview

Conferences were held from November 1989 to April 1992 and were regional in scope. They were held in Elkton (northern Maryland), Baltimore (central Maryland), Chevy Chase (southern Maryland), Easton (eastern Maryland), and Hagerstown (western Maryland).

The first conference in Elkton was a test event. Eighty-five people attended, representing a variety of professions. The conference focused on wildlife habitat considerations during the land development process and did not include a workshop. The workshops were the result of the observed need for more interaction among the various professional types present in Elkton.

It appeared that the participants, although enjoying the presentations, were most enthused by the short break included in the agenda when they were able to meet one another and discovered they shared similar problems and interests. In a conference evaluation questionnaire, the 2 most striking responses from participants were that they would attend another conference like this and that they wanted more time to interact with each other.

With our test successful, we embarked on the next 4 conferences. Like the Elkton session, each conference had a basic theme which was covered during presentations in the morning. In Baltimore, environmental planning was featured. In Chevy Chase and in Hagerstown, forest conservation was the primary topic. The Easton conference featured wetland conservation and enhancement. After each conference, participants were mailed an evaluation questionnaire and a list of all professionals present by profession, including their work address and telephone number.

The Baltimore conference was used to solicit involvement in a multidisciplinary steering committee which would provide input to the DNR about subject areas and methods of communication most effective for each key profession. This steering committee was formed and was involved in the planning and implementation of the three remaining conferences after Baltimore.

The workshop process described below was used in the last 2 conferences held in Easton and Hagerstown. The conferences in Baltimore and Chevy Chase also featured workshops but these were part of a learning process and contained experimental elements which did not seem to work. (These experiences will be described in the results and discussion section.)

Workshop Description

The workshops were arranged for up to 200 participants. All participants worked in teams of 6 to 10 people. Prior to the conferences, registrants were assigned to a team by profession to ensure the greatest variety of disciplines per team possible. There were 3 groups of teams assigned by primary colors: red, blue, and yellow. Each team was numbered chronologically within each color (i.e., Red 1, Red 2, Yellow 5, etc.), and tables were marked with numbers and colors prior to the workshop. For each color group, there was a facilitator, called a fact person, to clarify directions and ease the process of the workshop for each team. A lead facilitator was responsible for guiding the entire workshop and providing direction for the whole group. The lead facilitator followed a pre-written script and enhanced the workshop with 3 slide projectors showing simultaneous instructions on 3 screens. On one screen was the purpose of the workshop, which was necessary to keep all participants focused on why they were there. On another screen was the agenda for the afternoon, with the amount of time each exercise would take. This was done to ensure that all participants were current with the program. On the last screen was a description of each exercise or "task" in turn.

Participants in the teams were to conceptually design an environmentally sensitive and economically sound residential development site. Each team worked on the same site, which was an actual recorded plat from a county in the region in which the conference was held. Sites of 20 to 32 ha with unique environmental problems from the regions were selected. For example, a site with wetlands was selected for the Easton conference because of extensive wetlands on Maryland's eastern shore, and a site with steep slopes was selected for the Hagerstown conference because of western Maryland's mountainous terrain. The names of the development, developer, and all roads and place names on the original plat were changed to protect the interests of the parties involved in the "real" site.

For the first exercise, each team was given a large copy of the plat with boundary lines, soil delineation, forest cover, topographic lines, and existing water and sewer lines. They were also given a set of information which did not require an on-site survey. This included a National Wetlands Inventory map, required lot densities, maximum and minimum lot size, a list of hydric soils or erodible soils, and the potential market and cost of future homes. The instructions for this task were for the team to create a concept design for a residential development using the information given. The teams were to designate a recorder to write down the process used to create the design, any missing information necessary to continue the design, and how each professional contributed to the process.

During the second task, the teams were given information which could only have been obtained by conducting on-site surveys. This included a wetland delineation, a list of potential wildlife species according to the habitat present within the region, a forest inventory, a summary of information about rare species on the site, and a summary of neighboring land use. Also, teams were given a list of special interest groups who threatened to sue if their interests were not met. These were fictional. Financial losses to the project as a result of the lawsuits were indicated as

dollars per acre. The teams were to follow the same instructions as in the first task. They also were to record how this new information helped or hindered their design and how the various professionals were more or less easily able to contribute to the process.

After both tasks were done, the whole group of participants joined in a discussion based on comments generated from each team during the 2 tasks. The discussion was intended to explore the need for change in the development process and to generate thoughts about how participants could contribute to that change.

Results and Discussion

Over all, NDD conferences accomplished their objectives. Relationships established between professionals at the workshop table have lasted to the benefit of development projects statewide. Development professionals, including developers themselves, landscape architects, and engineers learned about resources available to them at county planning offices as well as about wildlife biologists and foresters who could provide technical assistance to them. Wildlife biologists learned more about planning and zoning restrictions and engineering constraints which make providing wildlife habitat recommendations a unique challenge.

Land planners fairly consistently topped the others in numbers participating in each conference. This was thought to be because planners are often placed in the role of moderator between various interests in development projects and see the need for using their position to incorporate biologists and other resource professionals in the design approval process (Butler 1993).

In both forestry-related conferences, engineers made up less than 10% of the audience but during the conference about wetlands, about 15% were engineers and surveyors. This may have been because engineers and surveyors are frequently called upon to design around the hydrology of a site because of local, state, and federal wetland regulations.

Developers made up less than 10% of the participants in all conferences. This was thought to be because developers are not typically involved in the design process. They hire engineers, landscape architects, and planners and rely on them to provide creative design (Cover 1990). However, it should be noted that the developers have to approve of their designs and need to be introduced to financially profitable and efficient ways to incorporate wildlife habitats into residential sites.

Wildlife biologists made up an average of 12% of participants at each conference. Most were not actively involved in their groups until the second task, where specific biological information was provided. With wetlands, forests, and wildlife habitat and species clearly defined on the site, biologists were able to contribute their expertise and perspectives. For wildlife biologists, our "hypothesis" predicting the ability of professionals to contribute to design based on information available seemed to be true.

Foresters constituted about 8% of participants at each conference. Because of Maryland laws limiting development in relation to forests in certain areas, Maryland foresters had prior experience working with the design process and therefore

were more comfortable with it than were biologists. The contrast in their participation in the first and second task was not so great.

Architects, lawyers, bank loan officers, and many other professionals with varied interests in development design also participated in the conferences. Teachers and concerned citizens attended in very small numbers.

Results of evaluation surveys showed that most participants felt the NDD experience was of benefit to them. There were requests for more technical presentations and workshop exercises. Teaching techniques was not the purpose of NDD and, since evaluation surveys indicated that NDD's purpose was useful, no changes were made to the NDD format in response to these requests. However, it was evident from comments on returned surveys that teaching techniques for mitigating, creating, or protecting wetlands, forests, and other wildlife habitats is in demand. Future conferences and workshops in Maryland or elsewhere should consider this approach. Another request from participants, which should be explored in the future, was using conferences and workshops, like NDD, to apply certification credits necessary for some professional groups to maintain their license to practice.

Conference evaluations from the final 2 conferences included many comments relating to the discussion period at the end of the workshop. Participants indicated that they wanted to see more of a conclusion to the conferences rather than a discussion period.

Discussion of Workshop Format

The workshop format contributed to some lively discussions among team members. In some cases, interestingly enough, development professionals argued with their teams on the side of preserving sensitive habitat areas while biologists argued for building more homes. This spontaneous reversal of perceived roles of each professional group might have helped reduce myths about particular value systems often attributed to entire groups and applied to every situation. It is often these perceptions that prevent initial contacts across professional boundaries.

The Baltimore workshop was the first effort to apply 6 or so different professional backgrounds in a team to one task. A minimum of instruction was given to each group in the hope that the teams would be creative in their designs, unconstrained as they were by regulation. The temptation to apply regulations was too strong for many participants. Since they were confused by the lack of direction, they fell back on regulations in their local areas to make up for it. We corrected this by using the directions described in the Workshop Description section. These instructions seemed to allow for some creativity while providing guidance needed by most participants.

In Chevy Chase, the workshop included a segment where each professional in a team changed places with another type of professional. For example, a biologist became an engineer. This was done to help point out to the teams that professional perspectives, other than their own, are also valuable to the design process. This

segment caused confusion among participants because they were not prepared to take on an unfamiliar professional role.

Recommendations

Natural Design in Development was a valuable learning experience, particularly for the staff of the Wildlife Division of the DNR. As a result of this experience, we feel that NDD has applicability to other state wildlife agencies. This is especially true in states which feel the pressure of development on wildlife habitat and who's wildlife agencies have recognized that their staffs will need to have working relationships with a wide variety of professionals in order to effectively conserve wildlife populations in the face of this development.

It is recommended that agencies that would like to use a forum similar to NDD, use the experience and expertise of all disciplines to be included. It is also vital to include a human dimensions specialist in the planning and coordinating of this type of forum. Having a person who understands how to arrange information and how information is processed by recipients is critical. The Maryland DNR was fortunate to have such a person who helped us create a forum that was not biased to any one profession and was sympathetic to all. Our human dimensions specialist was also able to help us keep the scope of each conference realistic in terms of what the participants would be able to absorb in one day.

Another key to the success of this effort is a person who has vision and the organizational skills to tackle minute details. Vision means the ability to concentrate on a single goal and to see the long-term implications of achieving that goal. It is important because it is necessary to keep the purpose and the presentation of information consistent. When so many different disciplines and interests pull on a project to meet particular ends, a person with vision can keep the project on a steady path toward the final goal, emphasizing what each interest has in common.

Although they seem trivial at times, the minute details involved in coordinating a steering committee of multiple disciplines toward the goal of producing these conferences were critical. Similar to a diplomatic mission which coordinates the common interests of varied countries and cultures, one mistake or miscommunication could potentially damage the ties we tried to make among very different professions. Time, thought, and careful organization are vital to producing an experience for multiple interests which is mutually beneficial.

The workshop format of the last 2 conferences worked well and we would recommend it to other agencies. It had lasting value, attracting over a hundred participants to each of the conferences, with several individual participants coming to both sessions. It is a comfortable situation, non-technical, and allows for maximum interaction time among the professional groups.

Natural Design in Development will not solve all the problems a natural resource agency may experience with respect to interfacing with development or land planning professionals, nor will it solve the problems of altered wildlife habitats caused by residential or any other type of development. However, NDD is a

way to open the lines of communication and a way to establish working relationships among natural resource, land planning, and development professionals which can be beneficial to wildlife, developers, and housing consumers.

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