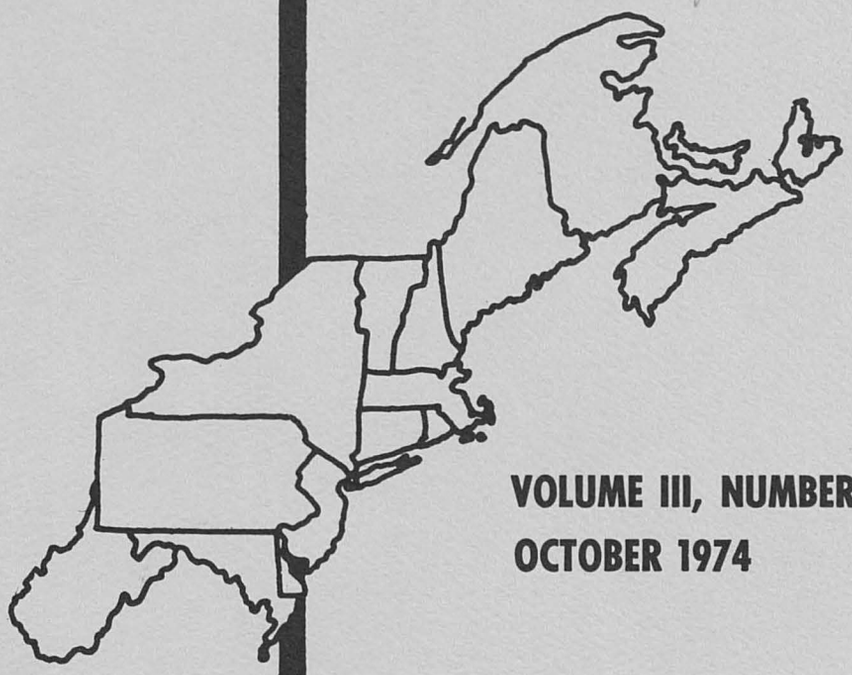
JOURNAL OF THE

Northeastern Agricultural Economics Council

(Proceedings issue)



VOLUME III, NUMBER 2
OCTOBER 1974

AN APPROACH TO RATING ENVIRONMENTAL QUALITY IN SEASONAL HOME COMMUNITIES

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Introduction

Some kinds of research dealing with environmental problems are faced with the need to measure the relative qualities of different environmental situations. The assessment of environmental impact for resource development projects (including the no-build alternative) when alternative locations are considered implicity involves a comparison of the qualities of different environments. Russell Train, Head of the EPA, has made a plea for the development of environmental indices [20]. There have been a number of attempts to quantatively rank or rate environmental situations (8, 9, 13, 15, 17). Economists are emphasizing the need to objectively measure the value of environmental attributes (3, 5, 12, 18), and considerable work has been done in trying to understand the way in which people perceive environmental attributes (2, 4, 10, 19).

The study upon which this paper is based[1/] involved examining the environmental quality effects associated with 18 seasonal home communities in five Northeastern states. It readily became apparent early in the study that a methodology would have to be devised whereby these communities could be ordered or ranked in terms of their relative environmental qualities. Manpower and cost constraints precluded an

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1/ This paper discusses a portion of a much larger research project, recently completed, which was sponsored by the Cooperative State Research Service, U.S.D.A. The project, "Environmental Quality Effects Associated with Seasonal Home Communities" (NE-65), was directed by a technical committee composed of the following individuals: Malcolm Bevins, University of Vermont; Gerald Cole, University of Delaware; Donn Derr, Rutgers University; Homer Evans, West Virginia University, (Advisor); Alvin Lee, CSRS, USDA (Advisor); Donald Tobey, University of Maine, and the author. The author acknowledges the significant contributions made by the other members of the technical committee to the work reported in this paper.

intensive data gathering approach which would provide objective measures upon which to base the ratings. But these are constraints with which many researchers must contend.

This paper (1) discusses an environmental quality rating form developed by the research team, and (2) presents an evaluation of it based on (a) environmental quality perceptions of seasonal home owners, and (b) the values of seasonal home properties. The rating form is not primarily objectively oriented, although it does attempt to quantitatively rank environmental situations. It makes no attempt to objectively measure the value of environmental attributes. It is relatively easy, quick, and economical to use and for these reasons it may be helpful, with appropriate modifications, to other researchers.

The Study Areas

Thirteen of the 18 seasonal home communities were located on lakes varying in size from 45 acres to 2,400 acres. The remaining 5 communities were located directly on the Atlantic seashore or on ocean bays. The communities ranged in size from 34 dwelling units to 2,100 units, with the proportion of seasonal homes to total homes varying from 20 percent to 100 percent, the remaining being permanent dwelling units. The age of the communities varies greatly; a few were well established in the late 1800's, while some represent recent efforts by development corporations. Most of the communities developed in the absence of any land use controls or developmental restrictions; a few have deed restrictions in effect. As a result, the appearance of the communities in terms of age, upkeep of home, size of lots, design of homes, size of homes, layout of the roads, number of homes, and presence of commercial activities varies widely.

The Environmental Quality Rating Form

A systematic approach to evaluating the environmental components in the 18 study areas was necessary in order to proceed with the objectives of the overall study. At a minimum, the better communities had to be identified from those communities that had poorer environmental attributes. To this end, an environmental quality rating form was developed and pretested by the research team, with several subsequent modifications made to it. The pretests pointed out several weaknesses of the system, principally in the distinction between natural and man-made features of the environment, and in the relative importance given to the various environmental components. An original version of the rating form considered simultaneously both the natural features of the area and those features that reflected the developmental efforts of man, such as structures, community design, intensity of noise, and so forth. The pretest showed that considering both types of features simultaneously produced some unusual results. For example, a community with outstanding natural features but containing small homes of very poor quality and closely aligned on narrow lots, rated

higher than another community of lesser natural attractiveness but which contained seasonal homes of very high quality. To correct this problem, the system was revised so that there were two separate ratings, one for natural features and one for man-made features.

The rating for natural features was divided into three parts. The first part dealt primarily with water quality and condition of the beach and lake bottom. The second part considered broader aspects of the lake as a whole, such as size, scenic setting and shoreline. The third part dealt with land characteristics, such as soil depth, permeability, and topography. There were 15 items to be rated dealing with water characteristics and 8 items dealing with land features.

The rating of man-made features incorporated 31 items or characteristics (subdivided into 2 groups). The first group considers 11 characteristics reflecting the seasonal homes themselves--their design, maintenance, landscaping, setting, spacing (lot size) and so forth. The second group (20 items) examines the development aspects of the community at large--conflicts in land use, density of development, density of use of water and beach areas, noise, odors, traffic, street layout, and so forth.

Each of the separate characteristics was rated from 1 (bad) to 5 (excellent) based largely upon the judgement of the people doing the rating. The pretest pointed to an obvious weakness of the approach, in that all characteristics within each group were considered of equal importance, i.e., each characteristic had an equal influence on environmental quality. To correct this deficiency, certain characteristics in each category were weighted, which in effect, made them more important than the non-weighted items in determining the environmental quality level of the community. The characteristics that were weighted in each of the groups were selected by a consensus of the five members of the research team. Out of the 54 natural and man-made features on the rating form, 29 were selected for weighting. There was no attempt made to weight the relative importance of the different groups within the natural and man-made categories.

The Investigators' Environmental Quality Rating

Seventeen of the study areas were rated by the five investigators travelling as a team to each community (one community in Vermont was not visited due to travel time constraints). Each investigator, independent of the others, completed a form after a close examination of the community. The investigator from the state in which a community was located provided certain background information, such as local ordinances or regulations, intensity of use during summer weekends, incidence of flooding or vandalism, and the like.

For each of the 17 study areas rated, the mean of the rating scores provided by the five investigators in both the natural features and man-made features categories was calculated. Because of difficul-

ties in making comparisons between lake communities and ocean communities in terms of their natural features, it was felt desirable to further stratify the communities on this basis. For example, the size of a lake or the scenic quality of its setting strongly influences environmental quality. No such comparison can be made for ocean communities, for the size is infinite (in practical terms) and the scenic setting is virtually a constant. Table 1 summarizes the Investigators' ratings of natural and man-made features for both lake communities and ocean communities.

Table 1
Investigators' Environmental Quality Ratings
of Natural and Man-Made Features,
by Lake and Ocean Communities

Natural Features		Man-Made Features	
		Lake Communities	
	Rating		Rating
Caspian (VT)	121	Ganoga (PA)	195
Seymour (VT)	108	Naomi (PA)	163
Ganoga (PA)	107	Caspian (VT)	149
Winthrop (ME)	102	Eden (VT)	138
Maidstone (VT)	99	Forest (NJ)	134
Naomi (PA)	94	Seymour (VT)	134
Elmore (VT)	91	Winthrop (ME)	110
Eden (VT)	89	Elmore (VT)	109
Harmony (PA)	77	Maidstone (VT)	108
Cranberry (NJ)	75	Cranberry (NJ)	85
Forest (NJ)	73	Harmony (PA)	80
Harveys (PA)	73	Harveys (PA)	70
		Ocean Communities	
Fenwick (DEL)	116	Harpswell (ME)	115
S. Bethany (DEL)	109	S. Bethany (DEL)	101
Harpswell (ME)	86	Pot-Nets (DEL)	92
Pot-Nets (DEL)	67	Fenwick (DEL)	86
Oak Orchard (DEL)	64	Oak Orchard (DEL)	69

The Recreationists' Environmental Quality Rating

During the course of the research, a questionnaire was completed by randomly selected seasonal home occupants (recreationists) in each study area. In it, they indicated the degree (strongly or mildly) to which they agreed or disagreed with certain statements describing the

environmental features of their communities. Of the 37 statements of this kind on the questionnaire, 9 of them were related to natural environmental characteristics and 28 dealt with man-made environmental characteristics.

The recreationists' environmental rating was computed by summing the values (from 1-4) of the questions in each of the two categories (natural and man-made) for each observation. The community rating was then computed by dividing the number of observations per community into the accumulative adjusted total of all observations per community. By ordering the ratings, a ranking of the communities is obtained based on recreationists' perceptions of various environmental components within each of their own communities.

A Comparison of the Two Ratings

Table 2 shows a comparison of the rankings of the communities as determined by the Investigators' and Recreationists' ratings. In this table all the communities have been combined under the man-made features group. A Spearman Rank Correlation Analysis indicated the corresponding ratings for natural and man-made features were significantly correlated. The correlation between the two ratings for natural features, lake communities only, was .685 (significant at the 5% level); for man-made features, lake communities only, it was .853 (significant at the 1% level); and for man-made features, all communities combined, it was .801 (significant at the 1% level). It was not possible to test the significance between the two ratings for ocean communities because of the few number of ocean communities observed in the study.

Several conclusions can be drawn from a comparison of the two rating approaches. There is more agreement between the recreationists and the investigators when evaluating the man-made features of a community than when evaluating the natural features. There was very close agreement between the recreationists and investigators for those communities at the extremes of the ranking when ratings of the man-made features were made. Both groups completely agreed on the two best and the two worst communities. There was less agreement on the ranking order for communities falling between the extremes. It should be pointed out that the recreationists rated only their own community and had no knowledge of the other communities, whereas, the investigators examined and rated all communities. It is quite apparent from the results of these ratings that recreationists are aware of many of the conditions contributing to both low and high quality environments in their communities.

There may be some degree of correspondence between the high and low quality communities in both the man-made and natural features categories for the two different ratings. For example, Ganoga, Naomi, Caspian and Seymour are ranked by both ratings as among the better communities from the standpoint of both natural and man-made features,

Table 2
Comparison of the Rankings of the Investigators' and the Recreationists' Environmental Quality Ratings

Natural Features			Man-Made Features		
Lake Communities	Recreationists Ranking	Investigators Ranking	All Communities	Recreationists Ranking	Investigators Ranking
Ganoga (PA)	1	3	Ganoga (PA)	1	1
Naomi (PA)	2	6	Naomi (PA)	2	2
Caspian (VT)	3	1	Forest (NJ)	3	5
Maidstone (VT)	4	5	Caspian (VT)	4	3
Seymour (VT)	5	2	Pot-Nets (DEL)	5	12
Forest (NJ)	6	11	Seymour (VT)	6	6
Eden (VT)	7	8	Harpswell (ME)	7	7
Winthrop (ME)	8	4	Eden (VT)	8	4
Cranberry (NJ)	9	10	Maidstone (VT)	9	10
Elmore (VT)	10	7	Fenwick (DEL)	10	13
Harmony (PA)	11	9	S. Bethany (DEL)	11	11
Harveys (PA)	12	12	Cranberry (NJ)	12	14
			Harmony (PA)	13	15
Ocean Communities			Elmore (VT)	14	9
			Winthrop (ME)	15	8
Harpswell (ME)	1	3	Harveys (PA)	16	16
Fenwick (DEL)	2	1	Oak Orchard (DEL)	17	17
S. Bethany (DEL)	3	2			
Pot-Nets (DEL)	4	4			
Oak Orchard (DEL)	5	5			

whereas Harveys, Harmony, Elmore and Oak Orchard are near the bottom of both rankings in both categories. This suggests an interrelationship between the quality of the natural environment and the quality of the man-made environment, and this interrelationship is readily perceived (although perhaps not explicitly identified as such) by recreationists in their seasonal home communities.

The Relationship Between the Ratings and Property Values

Many researchers believe that property values tend to capture or reflect environmental effects. The hypothesis is that property values are inversely related to the concentration of pollutants (including scenic degradation), and a number of studies support this (1, 6, 7, 16). If we accept this hypothesis, then the environmentally better communities should be the ones that also have higher average values for seasonal home properties.

Regression analyses were run using property values means for each of 15 communities[2/] as the dependent variable and a large number of independent variables, including both the investigators' and the recreationists' environmental quality ratings. Among the independent variables that consistently showed significance in explaining variation in mean property values was the investigators' man-made rating (significant at the 1% level). This high level of significance indicates that this index, although subjective and arbitrary in its interpretation and application, nevertheless reflects to a considerable degree the different environmental situations that existed in the communities studied. The investigators' natural rating was significant at the 10% level in some regression equations. The equations explained about 90% of the variation in property value means.

When the recreationists' natural and man-made ratings are substituted for the environmentalists' ratings in the same equation, only the recreationists' man-made rating is significant at the 5% level, accompanied by a slight drop in the corrected R^2. It appears, therefore, that the investigators' ratings have better explanatory ability for property value variations between communities than do the recreationists' ratings. Moreover, the zero-order correlation matrix shows that correlation between the two investigators' ratings is much less than that between the recreationists' ratings ($r = .49$ for the investigators' while $r = .89$ for the recreationists'). This indicates that the investigators' ratings distinguish more precisely between natural and man-made features than do the recreationists' ratings.

2/ Three communities were omitted: Bomoseen in Vermont (no investigator rating was made); Maidstone in Vermont (no property values could be obtained because all seasonal home sites are leased from a lumber company); and Pot-Nets in Delaware (entirely a trailer community).

This is not unexpected, since the investigators visited and rated all communities, whereas the recreationists only were familiar with and "rated" their own community.

As a further check on the validity of the investigators' ratings, a regression analysis was run for the same 15 communities using individual property value observations[3/] as the dependent variable (526 observations). The independent variables included several property and community descriptors, some socio-economic and demographic indicators, and 15 dummy variables identifying the respective communities. The equation explained 51 percent of the variation in property values (R^2 corrected). The regression coefficients for the dummy variables that identify the communities not accounted for by other independent variables. Included in the average values represented by the coefficients are the effects of the respective factors relating to environmental quality, since no direct measure of the quality of the environment is included in the equation.

The hypothesis behind this exercise was that the ordering of the communities by the regression coefficients of the dummy variables would be the same as the ordering of communities by the combined natural and man-made environmental values as calculated from the coefficients of the investigators' rating in the previous regression exercise. In other words we are comparing an ordering of communities based on a component of property values which embodies all the non-home attributes of each community but which was derived independently of any environmental quality index, to an ordering of communities based on a component of property values determined by a subjective and arbitrarily weighted environmental quality rating scheme.

Table 3 presents the average property values by community and the respective rankings as calculated from the two regression exercises. These rankings are not to be considered rankings by environmental quality alone. Although both rankings have important environmental quality components in them, they both reflect other community factors as well.

A Spearman rank correlation test shows a highly significant correlation of .89 between the two rankings. The first 6 communities have identical rankings, with some minor variation in the order of the remaining 9 communities. Conclusions from this statistical exercise are that property values are associated with different levels of environmental quality, and despite the fact that the environmental quality ratings developed by the investigators for this study are subjective, they are quite realistic and useful. If they are used properly, environmentally good communities can be distinguished from environmentally poor communities.

3/ Property values used in this study were owner estimates as obtained from the questionnaire.

Table 3
Comparison of Rankings of Property Values as Determined by Investigators' Index and Regression of Communities on All Property Values

Community	Regression Values	Analysis Rank	Investigators' Values	Rating[a] Rank
Ganoga (PA1)	$24,376	1	$25,445	1
Naomi (PA4)	24,079	2	21,740	2
S. Bethany (DEL4)	23,488	3	18,709	3
Fenwich (DEL1)	23,064	4	18,323	4
Forest (NJ1)	19,331	5	17,431	5
Caspean (VT2)	15,889	6	16,060	6
Harmony (PA2)	15,747	7	13,855	8
Harveys (PA3)	15,087	8	12,704	10
Oak Orchard (DEL2)	13,869	9	11,701	12
S. Harpswell (ME1)	13,712	10	9,937	15
Cranberry (NJ2)	13,389	11	14,018	7
Seymour (VT6)	9,596	12	13,611	9
Eden (VT3)	7,256	13	11,946	11
Winthrop (ME2)	7,199	14	11,219	13
Elmore (VT4)	5,817	15	9,999	14

[a] Corrected for New England location factor.

No cause-effect relationship can be shown from this analysis. It is not apparent whether the higher value homes have created the better quality environments, or vice versa. The analysis does indicate, though, that there is a direct relationship or association between property values and environmental quality. The communities with more expensive homes are also the better communities environmentally, which suggests that only the wealthy are able to maintain and enjoy high quality environments. We do not agree with this logic, and see no reason why, with careful safeguards, a community could not protect the seasonal home environments for more than just the wealthy members of society.

Conclusions

The investigators' rating form as developed in this study has several disadvantages. First, because it is not based on objective criteria, it requires subjective evaluation by the persons using it. Where several people use the rating form and averages of the rated values are computed, individual variation tends to become suppressed. The purpose of the rating form used in this study was not as much to

evaluate environmental factors in a pure or absolute sense, but rather to evaluate how a group of people (the investigators) perceived specific environmental situations. The perceptions of environmental differences by the investigators were then compared to the environmental perceptions of the recreationists living in these settings. It should be pointed out, however, that objective criteria are available for evaluating some of the factors included in the rating form.

Because of its subjective nature, the form is not suitable for rating environmental qualities of different communities by different people. A rating of a set of communities by one group of people should not be combined or compared with a rating made by a different group of people in a different set of communities.

Another major weakness of the rating form lies in the relative weights assigned to different variables. No one disagrees with the fact that some factors are more important than others in terms of their effect on environmental quality. The important and difficult question to answer is what factors and to what degree are they more important?

An advantage of the rating form used in this study is that it can be completed relatively quickly and easily. If widely separated communities are being evaluated, however, travel time and costs between them must be considered, since the same individuals must do all the ratings if the communities are to be compared. A much more objective rating approach would require considerably more time to complete, since empirical data would have to be obtained (for example, a laboratory analysis of water samples for water quality data).

The high degree of correlation between (1) the investigators' ranking of the communities and the ranking by the recreationists, and (2) the investigators' ranking and a ranking based on regression coefficients representing all environmental attributes of the communities, indicate that the investigators' perceptions of environmental quality are not too unlike those held by the recreationists nor those reflected by market prices for recreational property. We feel the rating form accomplished its primary function, that of providing a basis for determining the relative environmental quality of the communities in this study. With appropriate modifications to meet specific needs, a rating form similar to the one presented here could be useful in other situations.

A major research need becomes evident, however, from the experience gained in this study. Any environmental quality rating approach will be more useful, acceptable and applicable the more it is based on objective criteria, and the weighting of the components reflect more precisely the priorities and values of society. To this end, there exists a fruitful area for future research.

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