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RECREATIONAL HOMES:

TOWN CHARACTERISTICS AND VARIATIONS

IN CONCENTRATIONS

Pamela H. Pataky
and
Edmund F. Jansen, Jr.

Recreational home development has been and is likely to continue to
be a major concern of many local governments in New England and elsewhere.
Recreational homes are defined here as homes that are not the owner's pri-
mary residence and are used for vacation, leisure, or recreation. It is
generally agreed that this type of development is initially beneficial to
local government finances. While more town services may be required, the
cost is usually outweighed by the added tax revenue. It is believed, how-
ever, that over time recreational homes may be converted to primary homes,
which could lead to cost increases without proportional increases in revenue
(Am. Soc. of Planning Officials, Clark, Payne). Also, from a wider perspec-
tive, the loss of agricultural and forest land to this use may not be
desirable.

The objective of this study is to explore factors influencing the con-
centration of recreational homes among minor civil divisions. Most attempts
to identify determinants of recreational home location have used the recrea-
tional home owner or renter as the unit of anlysis (Burby, Bureau of Outdoor
Recreation, Marans, Ragatz, Tombaugh). States were the unit of analysis
in a regression model which had number of recreational homes as the dependent
variable and factors related to demand as the independent variables (Ragatz).

By measuring the degree to which places possess attributes identified
in the owner-renter studies, the distribution of recreational homes among
minor civil divisions may be looked at as a function of the supply of these
attributes. A multiple regression model was developed to apply this concept
to the State of New Hampshire.

THE MODEL

Concentration of recreational homes among minor civil divisions is hy-
pothesized to be a function of three factors: natural resource amenities,
a local institutional factor, and accessibility. The expected regression

Pamela H. Pataky is Research Assistant and Edmund F. Jansen, Jr. is Pro-
fessor of Resource Economics, Institute of Natural and Environmental Re-
sources, University of New Hampshire.

relationship can be expressed as:

where

Dependent Variable

Rec = proportion of all homes recreational

Natural Resource Related Amenities

W = square miles of inland water area

O = ocean frontage (0 = no, 1 = yes)

S = miles of shoreline

L = feet of ski lift within ten miles of population center

Institutional Factor

D = density of year-round population per square mile of land area

Accessibility

R_B = road distance (miles) from major metropolitan center

R_H = road distance (miles) from limited access highway

R_S = state road in town (0 = no, 1 = yes)

Error

u = random disturbance

This model was applied to New Hampshire using data for all 259 minor civil divisions. The state has 13 cities, 221 towns and 25 unincorporated places. Figure 1 shows the distribution of recreational homes in the state.

Community decisionmakers are usually more concerned with the rate of change than the absolute change. For this reason, the proportion of all homes recreational in each place is used as the dependent variable. This variable was computed using data from the 1970 Census Second Count tapes by adding "vacant seasonal" and "vacant held for occasional use" dwelling units. Because 1970 data was the most recent available for this variable, all other variables are measured at 1970 levels.
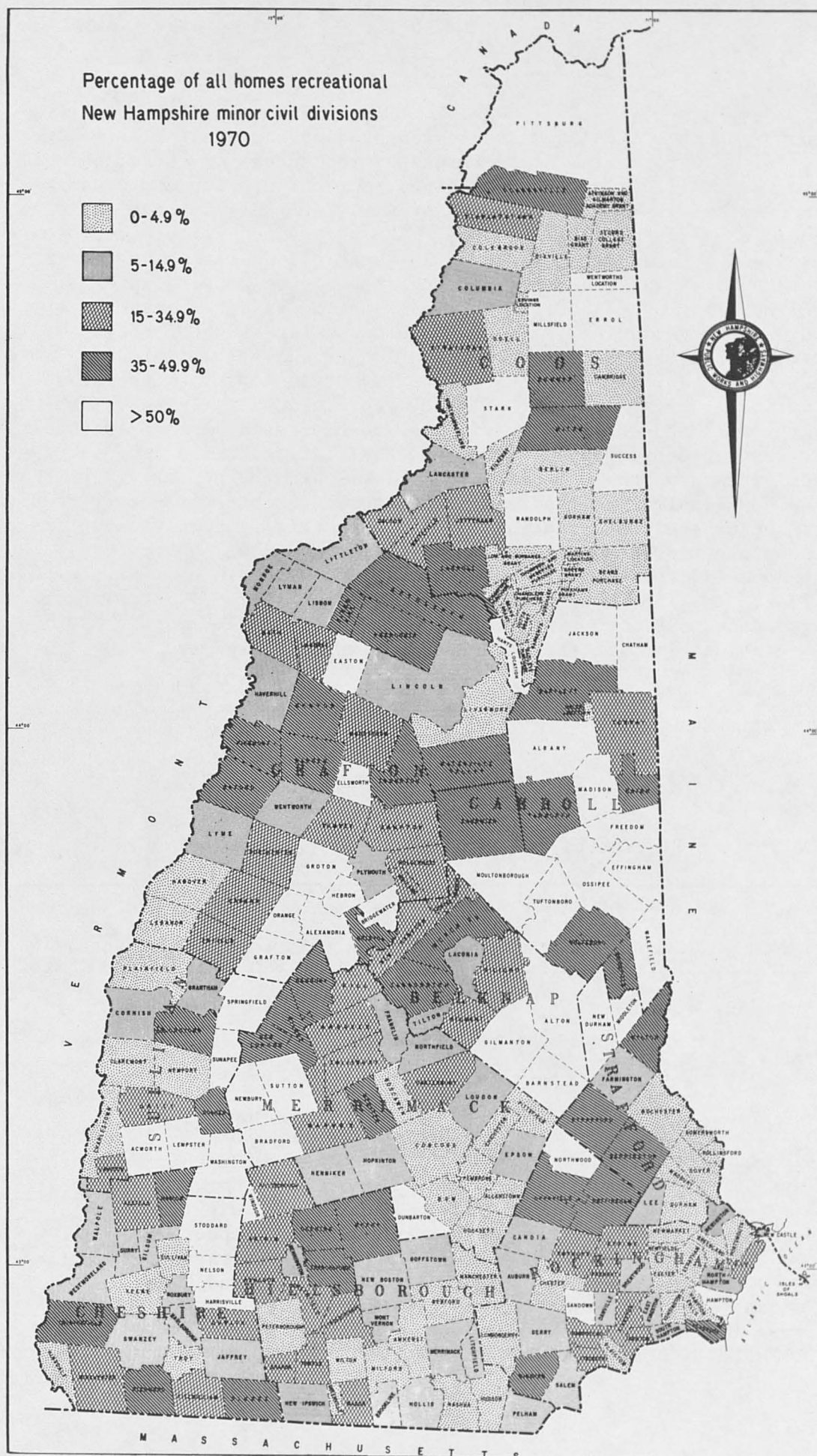
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Percentage of all homes recreational
New Hampshire minor civil divisions
1970

Figure 1

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Natural resource amenities are represented by four variables. Three of these, inland water area, ocean frontage, and length of shoreline, are related to the availability of water-based recreation. The dummy variable for ocean frontage is included because proximity to this attraction is not reflected in the inland water variable. The shoreline variable includes both inland and ocean shoreline. Even in those places that have only inland water there will not be a perfect correspondence between water area and shoreline; length of shoreline varies with the size and shape of the water body. Both variables are included because larger water bodies will permit a wider range of activities, but a longer shoreline will allow more people direct access to the water. A positive relationship with the dependent variable is expected for all the water-related variables. The inland water area and shoreline variables are expressed in Base 10 logarithms in the regression equation because their distributions suggest that the effect of each on the dependent variable is greater at low values than at high values (Table 1). The remaining natural resource amenity variable represents other active recreation. New Hampshire's geography and climate provide many opportunities for skiing. If a recreational homeowner is seeking this activity, the attribute he is seeking in his home is nearness to the slope. The lift length within ten miles of a place's population center provides a basis to compare places for this characteristic. A positive relationship with the dependent variable is expected.

Table 1

Univariate Statistics for Dependent and Independent Variables

Variable	Mean	Standard Deviation	Minimum	Maximum	Kurtosis	Skewness
Rec	.250	.239	.000	.912	-0.4	0.8
W	1.1	2.3	0.0	19.8	28.4	4.9
O	0.2	0.1	0.0	1.0	47.8	7.0
S	7.7	11.0	0.0	78.3	10.9	2.9
L	6942.5	10941.1	0.0	68554.0	5.1	2.1
D	104.2	251.0	0.0	2661.8	51.1	6.3
R_B	99.7	41.0	30.0	214.0	-0.3	0.5
R_H	17.2	16.1	1.0	76.0	2.1	1.6
R_S	0.9	0.3	0.0	1.0	8.2	-3.2

The purposes for which a recreational home is used imply a non-urban atmosphere. As a proxy for rural atmosphere, the year-round (permanent resident) population is used. A negative relationship with the dependent variable is expected. Again, the distribution of this variable suggests that its effect is greater at low values than at high values, so when the regression is performed it is expressed in Base 10 logarithms.

Accessibility was measured by three variables. Recreational home-owners tend to be urban residents seeking a change. In New Hampshire, the flow of recreational homeowners is predominantly from the more urbanized areas to the south, especially the Boston area. The road distance from Boston to the population center of each place was used to measure proximity to the primary market. But absolute distance alone does not describe the homeowner's trip. The time cost of travel also may enter into the location decision. If a large part of the trip is on local roads it will take longer than a trip of equal distance of limited access highways. For this reason the variable for distance from a limited access highway is included. To further measure the difficulty of the trip, a dummy variable is used to indicate whether or not there is a state road within the town. In New Hampshire, several unincorporated places have no roads. For these, the straight-line distance from the nearest road to the geographical center was used in obtaining the distance measures. Only two towns that had any roads did not have state roads.

Data for all independent variables was derived from state reports or records.

Table 2

Regression Coefficients

Variable	Initial Model		Revised Model	
	Coefficient	t	Coefficient	t
log W	.2242**	2.9110	.2626**	3.7515
O	.2619**	3.2519	.3073**	4.1964
log S	.1299**	3.1127	.0767*	1.9922
L	.0000+	0.5683	.0000+	1.2095
log D	-.2525**	10.1924	-.2922**	12.6609
R_B	-.0006	1.5076	-.0009**	2.5952
R_H	-.0019*	2.0479	.0005	0.5950
R_S	.3330**	6.7428	.0912*	1.6489
Uninc	---		-.4408**	7.4379
Constant	.2606		.6013	
R^2	.4981		.5893	

**Significant at .01 level, one tail test
*Significant at .05 level, one tail test

THE RESULTS

The results of the initial regression (Table 2) show the density and water-related variables to have the greatest influence on proportion of all homes recreational, if the water variables are considered together. This implies that if a place is relatively rural in character and has water for recreation it will draw recreational homeowners. Nearness to ski areas has little influence. Road distance from Boston was not significant, but road distance from highway and the presence of a state road were. The coefficients suggest a two-stage decision process. The prospective recreational homeowner first seeks a place that possesses the amenities he desires in his recreational home. Given two towns with identical amenities, he will choose the one that is easier to get to. The insignificance of the distance from Boston variable may be attibutable to New Hampshire's small size. Places that possess the other desirable attributes may be too closely clustered on this variable for it to show a significant effect. The coefficient for the ski area variable is more difficult ot explain. There are several towns in the northern part of the state that have high concentrations of recreational homes, are close to ski areas, and have no water attractions. It is possible that in the southern part of the state the ski areas serve people on day trips, while in the north they serve people who stay longer. This phenomenon could cause the overall relationship between ski areas and recreational homes to be very low.

The residuals for the initial regression show that the greatest deviations of observed from predicted values are in the unincorporated places. The unincorporated places are characterized by large landholdings, both by the federal government and the timber industry. In the absence of data describing the extent of these landholdings for the State's minor civil divisions, the degree to which the underlying characteristics of an unincorporated place affect the overall relationship can be estimated by creating a dummy variable with a value of zero for towns and cities and one for upicorporated places. When this variable is included in the regression, R^2 increases from .4981 to .5893. The coefficient of the new variables is negetative, as would be expected, and the t-value is high. The State Road coefficient decreased sharply. This is not unexpected because, while some unincorporated places do have state roads, only two places that do not have state roads are not unincorporated places. The coefficient for distance from highway changed sign, but became smaller and less significant, while the distance from Boston variable retained its expected sign and increased in significance. The unincorporated places tend to be distant from Boston, but a few have high proportions of recreational homes, only because they have a very small number of year-round homes. This could account for the change in significance of the distance from Boston variable. Unincorporated places also tend to relatively distant from highways; this could cause the distance from highway variable to become less important as this characteristic is reflected in the unincorporated place variable.

The additional variable also caused the shoreline variable to lose significance. Another characteristic of the unincorporated places is the presence of very little water, and controlling for the unincorporated places would lessen the influence of the water variables on the overall

relationship. The fact that only the shoreline coefficient decreased in significance, not both shoreline and water area, suggests that it is the combined influence of the two that is diminished. The two variables have a correlation of .81, which indicates that multicollinearity may exist. Therefore, the two variables should be considered together. A ratio of shoreline to water area, used with the water area variable, would eliminate this problem but would not be an accurate indicator of the relationship to proportion of all homes recreational. Many small ponds in a town would give a high ratio, while a part of one large lake would give a low one. Because small bodies of water do not permit the range of activities larger ones do, the relationship to the dependent variable would not be consistent.

The residuals also showed that predicted values for towns adjacent to cities tended to be too high. The ideal variable to deal with this problem would be the value of identical pieces of land in each place. It would be expected that land values in these places would be relatively high. The definition of "identical" is in itself an obstacle and, even if it were not, the data from which to compute this for all 259 places is not readily available. A dummy variable representing a town center within 10 miles of a city center would not be useful because the area of influence appears to depend on city size.

<center>SUMMARY AND CONCLUSIONS</center>

The regression models showed that the attributes of a place most likely to be associated with a high concentration of recreational homes are rural atmosphere (as represented by population density), availability of water for recreation, and not being an unincorporated place. Overall accessibility is also of some importance. Nearness to ski areas had little influence.

The factors identified here are, for the most part, beyond the influence of local decisionmakers. Water area is fixed by nature. Some changes can be made but if there is not sufficient water in the first place there is nothing to change. Also most changes that do take place are initiated or subject to approval by the federal government.

The ruralness of a place is the outcome of institutional factors working over a long period of time and of policies in the present that are made at higher levels. Nor can the local government control what roads are built beyond its borders or break up large landholdings within its borders.

If a town wishes to promote or discourage the building of recreational homes its best course probably would be to have less or more restrictive land use regulations than its similarly endowed neighbors. Two variables not included in this model were water quality and some measure of land use regulation. Water for recreation should be clean; within the strictures of federal quality standards, the types of land use permitted by a town will influence its desirability as a place for a recreational home. Land use regulation also can influence the concentration of recreational homes by making it relatively easy or hard to buy and build.

While this cannot predict the future location or impacts of recreational home development, it can provide a foundation for making those predictions. It can help to gauge what will happen if a large parcel of land is put on the market or if a new road is built. If the housing data is available for two points in time, it can be used to see whether recreational homeowners' preferences are changing. All of this information can be useful to decisionmakers in considering alternative policies to guide future development.

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