



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

[aesearch@umn.edu](mailto:aesearch@umn.edu)

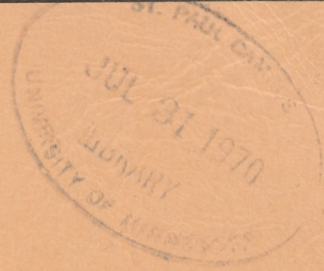
*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

*No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.*

Western Agricultural  
Economics Association.  
Proceedings.

2

WESTERN AGRICULTURAL ECONOMICS ASSOCIATION



# PROCEEDINGS

## 1969

Forty-second Annual Meeting  
July 20, 21, 22, 1969  
Oregon State University  
Corvallis, Oregon



# THE EFFECTS OF PUBLIC INVESTMENT IN RECREATIONAL FACILITIES ON A REGIONAL ECONOMY

by

Chauncey T. K. Ching  
University of New Hampshire  
and  
George E. Frick  
Economic Research Service, USDA

## INTRODUCTION

Situated in the heart of New Hampshire's most populous area yet surrounded by a sprawling wilderness, Pawtuckaway is the newest of 32 state parks. Constructed in 1965 by the State of New Hampshire, this \$2 million major addition to the State Park System is located on the shores of Pawtuckaway Lake in the southeastern corner of the state and is within a two-hour drive of metropolitan Boston's 2.6 million inhabitants.

This new park has been heavily patronized since it opened on July 1, 1966. Both camping and day use jumped from 75,000 in its first short season to 87,000 the following year and 112,000 last year. The number of camper days was 24,000 the first season, 35,000 in 1967, and 40,000 last year. Currently, a \$180,000 project is under way to develop 90 additional campsites raising the total for the park to 170.

Legislative bodies at all levels of government are responsible for justifying expenditures of public monies for recreation facilities. However, very few analytical studies of parks are made in conjunction with the appropriation of public funds. While Pawtuckaway Park was not studied prior to the appropriation of funds, the area appeared to have two ideal characteristics which would permit an economic assessment of public investments in recreational facilities. First, the area could be surveyed prior to the physical construction of park facilities. Second, once the park had been established, the area appeared to have the ideal ownership pattern to measure the impact of private versus public development of a land and water resource. Historically, the eastern shore of the lake was populated by seasonal home owners, while the western shore was virtually undeveloped due to the lack of road access. The western shore line was purchased by the State of New Hampshire and combined with other State owned properties to form the 5,300 acre park. This unique combination of land ownership permits the measurement and comparison of the impact of public and private investment in recreational facilities on a regional economy. This land use mix also provides the basis for some measurement of environmental quality and recreational usage of a water-based natural resource.

## OBJECTIVES

The purpose of this paper is to report the preliminary results of a research project designed to measure the impact of Pawtuckaway State Park on the regional economy. Preliminary results serve two purposes: (1) They document the short-run influence of the park on the growth and development of the region. (2) They provide basic input data for an analytical model which can be of a very broad scope and of a long-run nature. This model will compare the development of the region under the actual public-private development with the hypothetical cases of complete private or complete public development.

## DESCRIPTION OF THE PROJECT

The study was started in 1965 to coincide with the initial phases of the construction of the Park. During the summer of 1965 two types of data were collected. First, information was obtained on expenditure patterns, investment in real estate, user days, etc. by interviewing residents of 397 dwelling units. A 100 percent sampling of dwelling units was made around Pawtuckaway Lake, and a 10 percent sampling was made in the four-town area surrounding the Park. Second, all of the 169 business firms in the four-town region were interviewed to

determine their expenditure and income patterns. The information collected in this survey of residents and businesses in the region provides an initial measurement of recreationally-oriented economic activity prior to the establishment of the Park.

Since 1960 annual data have been collected relating to economic indicators such as local government expenditures, tax revenues, land transfers and valuations, and resident populations. In addition, since 1966 park users were interviewed to obtain their expenditure patterns and other characteristics. These annual data will be collected through 1970. Plans for 1970 also include a resurvey of business firms and residents in the region. This phase of the field work along with the initial survey will permit a critical assessment of the economic impact of the park on the regional economy. As researchers, we hope that the quality of our record-keeping will be adequate and our problem significant enough to entice future researchers to return to the Pawtuckaway region in 10 to 20 years to document some of the long-run changes.

### PRELIMINARY RESULTS

This paper presents some of the information collected which can be used in an economic analysis. It presents information on residents in the four towns. This includes both seasonal and permanent residents with particular emphasis on the lake shore residents on the eastern half of the Lake. The paper also presents data on the income generating characteristics of park users, the local business sector associated with providing services to park users and local residents, and selected economic indicators such as aggregate community assessed valuations, land transfers and values, government expenditures, taxes and population. In addition, the paper indicates some of the analysis which can be accomplished using these data.

**Residential Information** Of the 397 residences surveyed, 220 were permanent residences and 177 were seasonal residences. Of the 177 seasonal residences, 113 were lake-oriented on the eastern half of the lake. Of the lake-oriented seasonal residents interviewed, the majority live in the tier of suburbs north of Boston. The distance seasonal home residents traveled to reach their seasonal home varied from 2 to 85 miles, with the modal distance being approximately 45 miles.

Compared with the public park side of the lake which provided about 140,000 user days in 1966, the 113 dwelling units on the privately owned part of the Lake surveyed in 1965 provided 45,000 user days. On the basis of a water-oriented recreation activity these two measures may be thought of as comparable since the shore frontage of both the private and public sectors are approximately equal.

This user day comparison provides a measure of the intensity possible under public versus private development of an area. Such differences in intensity of use under different ownership patterns will be used in evaluating the long-run development of the area under assumed conditions of full private versus full public ownership patterns.

Over the period 1961-1965, lake-oriented residents expended approximately \$170 per year per residence for home improvements. Approximately 60 percent of this annual average expenditure was spent within the four-town study area. The major items of expenditure involved additions to existing structures while other categories include alterations, beach maintenance, water systems, and sewerage systems. It is interesting to note that the annual average expenditure for the improvement of water systems (about \$16.50 per year per residence) was four times greater than the expenditure for improvements in sewerage systems. If this expenditure pattern persists in the future, serious problems could arise as land use intensity increases.

In addition to expenditure patterns on home improvements, information was collected on expenditures for consumable items such as heating and cooking fuel; insurance; boat and automobile gasoline, oil, and repairs; and, groceries and household supplies. Both the amount expended on these and related categories of consumable items and the source of these purchases were recorded. These types of information on home improvements and consumable items will enable an economic assessment of private development on the Pawtuckaway area.

**Park User Information** In 1966, 1,390 day users (267 day user groups) and 371 campers (72 camper groups) were interviewed. Approximately 80 percent of the day users were from New Hampshire while the remaining day users were mainly from Massachusetts. In contrast, approximately 30 percent of the campers were from New Hampshire and 50 percent were from Massachusetts.

Eighty percent of the day users traveled less than 30 miles to use the Park. Thus, on the basis of the park users sampled, 70 percent of the users of the park resided within a 30-mile radius of the park. It will be interesting to determine if nearby residents will still be the major clientele as the park becomes more popular.

One of the more important dimensions needed to assess the public investment in Pawtuckaway Park is the expenditure patterns of day users and campers. For both types of park users, information was collected on six categories of expenditures: park entrance and related fees; snack bar-restaurant expenditures; groceries and supplies expenditures; gasoline and automobile expenditures; amusement and recreation expenditures outside of the Park; and, lodging expenditures outside of the park but within the four-town region. Average per capita expenditures in 1966 was \$0.62 per day for day users and \$1.29 per day for campers. Of these six categories, the last two had virtually no response, which reflects the unavailability of "outside" amusements and lodging in the four-town study area. A cursory look at the 1967 day user information reveals that per capita expenditures increased only slightly to \$0.66 per day and there were only slight changes in the distribution of expenditures among the six categories.

Using estimates of average expenditures per capita per day for each of the first four cost categories and utilizing attendance figures for 1966, it was possible to project total expenditures of day users and campers for 1966 (Table 1). Identical information for subsequent summers through 1970 will be generated and utilized to measure the changing impact of the park on the regional economy.

**Local Business Firms** A total of 169 business firms were surveyed in the four-town region. These included all types of firms which could conceivably provide goods and services to residents and/or Park users. The type of information collected included: the nature of the business; its location; gross dollar volume and the seasonal distribution of the volume; distribution of the expenses of the business firm, and, the business orientation of the firms indicates that about two-thirds of the gross income was derived from permanent residents, while tourists and seasonal home owners accounted for roughly 15 percent each. Schools, local government, and other miscellaneous sources accounted for the remainder.

Table 1. Projected Park User Expenditures in the Four-Town Study Area, 1966

Item	Day Users	Campers	Total
Park Fees	\$14,200	\$11,000	\$25,200
Snack Bar-Restaurant	13,200	2,500	15,700
Groceries and Supplies	2,600	13,000	15,600
Gasoline and Automobile	2,600	2,500	5,100
<b>TOTAL</b>	<b>\$32,600</b>	<b>\$29,000</b>	<b>\$61,600</b>

In the summer of 1970, we plan to resurvey the business firms to see if the seasonal distribution of income business orientation, and the proportion of income derived from the sale of goods and services in the four-town study area have changed significantly due to the introduction of the Park.

**General Economic Indicators Data** on general economic indicators in the four-town study area were collected for each year beginning in 1960 and will continue to be collected through 1970. Town information was collected on town expenditures and tax revenues, real property values and transfers, population and equalized valuation. In addition, similar types of data were collected for "barometer" towns, for the county in which the four study towns are located, and for the entire state. These barometer towns were selected to serve as checks against which some of the economic indicators of the four towns could be compared.

Regression analysis of equalized assessed valuations and tax revenue collections indicates that there is no significant difference in the annual average increase of either assessed valuation or tax revenues among the four towns themselves or among the four towns and the county containing the four towns. These results suggest that the park's influence on tax collections and assessed valuations is negligible--at least in the short time span of the annual observations.

All real property transfers have been recorded for each of the study towns since 1960. Information from the 1,400 transfers recorded includes sale price, size of plot, year sold, proximity to the Lake, whether the sale included buildings or not, and the town in which the property transfer occurred. Multiple regression techniques will be used to analyze these data by testing for significant differences in the rates of increase in land values in the four study towns against rates of increase in land values in the barometer towns.

#### PLANS FOR A LONG-RUN ANALYSIS--A SIMULATION MODEL

As researchers we realize that public investments in recreational facilities may not affect a regional economy in a short period of time. However, the unique land ownership and development pattern which characterizes Pawtuckaway Lake, along with the type of information collected over the past four summers, will permit a long-run assessment of Pawtuckaway via simulation.

A model will be formulated which will incorporate, as input data, expenditure patterns and days of use of both private residents and park users. It will generate the effects of these on local government expenditures, income of the region, land values, taxes, and assessed valuations under varying conditions of private-public development and rates of development.

An example of output from such a model will be the comparison of full private versus full public development on the environmental quality and local government expenditures. Under full private development, one might expect seasonal residences to convert to permanent residences which would increase town expenditures for schools, sewerage systems, water systems, and general social overhead. These increased town expenditures could then be compared with town expenditures under public development. Under full public development some land is removed from tax rolls which increases taxes for the private sector of the four-town area. On the other hand, public development practically guarantees an environmental quality consistent with open space land uses.

Although we plan to consider various combinations of public and private developments, the extremes of full private and full public development will probably be the illuminating cases. All projected effects can then be compared with the observed land development mix of approximately one-half private and one-half public. Hopefully, by making such comparisons the effect of public investments in recreational facilities can be viewed in a relevant perspective.