

**Arey's Pond & Namequoit River Survey**  
**Pleasant Bay Resource Management Alliance**

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## Introduction

### Background:

Arey's Pond and the Namequoit River are subembayments of Pleasant Bay. The Bay, one of the most biologically diverse and productive marine habitats on the East Coast, is designated as an Area of Critical Environmental Concern (ACEC). The surrounding Towns of Orleans, Chatham and Harwich have adopted a resource management plan to protect the Bay's resources. Among the priority recommendations of the plan is the development of nitrogen management strategies for the watersheds of water bodies that are experiencing excessive nitrogen levels. The resource management plan identifies Arey's Pond as being among the water bodies with excessive nitrogen levels due to limited tidal flushing and dense residential development within the contributing watershed. The high level of nitrogen is of concern because of potential negative impacts on water quality and marine life within the Pond and the adjacent Namequoit River and, potentially, throughout the Pleasant Bay system.

In light of these concerns the Alliance obtained funding from the Cape Cod Commission to undertake a watershed management demonstration project for the watershed contributing to Arey's Pond and the Namequoit River. The project has three phases:

- 1) To gather information on current conditions and trends-- in land use and recreational activity, for example-- as well as public perceptions related to water quality, and community awareness of the impacts of excessive nitrogen levels.
- 2) To use the data gathered in phase one to describe current conditions and highlight issues and opportunities for nitrogen management.
- 3) To engage area residents and property owners in a discussion of water quality goals and optional strategies for nitrogen management. The initial consensus on goals and strategies would provide an important foundation for further community planning and deliberation of nitrogen management options.

Although focused on Arey's Pond and the Namequoit River, it is hoped that the methodologies developed for the demonstration project will be replicated in other areas within the Pleasant Bay system.

### Research Objectives:

The primary objective of this research is to examine opinions of property owners within the watersheds of Arey's Pond and the Namequoit River regarding higher than normal nitrogen levels. Specific areas under study include:

- Importance of water-related activities
- Usage and observations of Arey's Pond and the Namequoit River
- Respondent opinions about critical nitrogen levels in Arey's Pond
- Respondent willingness to learn more about the issue of excessive nitrogen
- Respondent demographics

## **Methodology:**

To achieve these goals, 466 questionnaires were mailed to property owners within the Orleans portion of the watershed of Arey's Pond and the Namequoit River.\* As of January 28, 2000, The Survey Center, Inc., an independent market research firm located in New Seabury, Massachusetts, had received 96 completed surveys. This represents a response rate of 21%. A normal response rate for survey of this type is 10%.

Questionnaires were color-coded based on a property's proximity to the water bodies: Tier 1 – properties bordering the water bodies, Tier 2 – properties mid-range within the watershed, Tier 3 – properties at the outer edge of the watershed. The purpose of the color-coding was to evaluate differences in opinions based on proximity to the water bodies. The response rates for Tiers 1, 2 and 3 were 34%, 23%, and 9% respectively. Although useful for discussion purposes, the responses for distinct tiers need to be interpreted with caution due to the relatively small number of responses in Tiers 2 and 3.

To review the survey instrument, please refer to the technical appendices of this report.

\*This number represents nearly all property owners within the Orleans portion of the watershed.

## Executive Summary

### Respondents' Uses of Arey's Pond and the Namequoit River...

For both Arey's Pond and the Namequoit River, respondents place a high value on, or participate in, activities that require good water quality:

- ◆ Nature viewing is the primary use of respondents for either Arey's Pond or the Namequoit River
- ◆ Observing nature and accessing the water were the most highly valued uses of Arey's Pond and the Namequoit River, respectively
- ◆ A larger percentage of respondents place a high value on shellfishing and fin fishing than actually participate in these activities in either Arey's Pond or the Namequoit River. This finding suggests that activities can be important to residents even if they themselves do not participate.

Responses to questions about uses of the water bodies support the perception of Arey's Pond and the Namequoit River as popular boating locations. Also, increased boat usage was the most frequently cited observation among respondents for either water body.

### Respondents' Concerns about Nitrogen Levels...

Responses to questions about nitrogen levels indicate a high degree of awareness and concern, and also point out the opportunities for increased public education and discussion, particularly in the development of specific nitrogen management strategies:

- ◆ The majority of respondents are concerned about the nitrogen level in Arey's Pond (85%), would support policies that would result in a decrease in nitrogen levels over time (86%) and feel a responsibility as a property owner in the area to help reduce levels of nitrogen (81%).
- ◆ Forty-eight percent of residents would be willing to modify their septic system to enhance its ability to remove nitrogen and thirty-six percent are unsure if they are willing to do so.
- ◆ Almost all respondents would be willing to read materials sent to their home on this issue. Over half would be willing to have an audit done on their septic system at no cost and attend local informational meetings. Sixteen percent would be willing to participate in a committee to explore options on this issue.

### About Respondents...

The survey was mailed to nearly all property owners within the Orleans portion of the Arey's Pond/Namequoit River watershed. More than half of respondents are year-round residents and one-third are seasonal residents. More than half of the respondents have owned their property for ten or more years, only six percent rent all or a portion of their house to others.

## Water Use Value Rating

Seventy-three percent of respondents indicate observing nature in the Arey's Pond area is important. A notably higher percentage of those in Tier 1 report that using a boat in either body of water is important. Being able to access the Namequoit River is most important to three-quarters of respondents.

*Q.1. What value do you place on the following?*

### Arey's Pond

Percents indicate those with a value of 'important'				
<i>Being able to:</i>	<i>Total</i>	<i>Tier 1</i>	<i>*Tier 2</i>	<i>*Tier 3</i>
Observe nature	73%	80%	73%	57%
Use a boat	71%	78%	65%	62%
Access the water	65%	59%	62%	81%
Fish or shellfish	48%	47%	50%	48%
Moor a boat	45%	51%	46%	29%
Swim	30%	37%	23%	24%

### Namequoit River

Percents indicate those with a value of 'important'				
<i>Being able to:</i>	<i>Total</i>	<i>Tier 1</i>	<i>*Tier 2</i>	<i>*Tier 3</i>
Access the water	75%	71%	73%	81%
Use a boat	72%	78%	69%	57%
Observe nature	71%	71%	77%	57%
Fish or shellfish	52%	55%	50%	43%
Moor a boat	41%	53%	31%	24%
Swim	35%	47%	19%	24%

*\*Note: Due to low number of responses in Tiers 2 and 3, please interpret results with caution.*

## Use of Arey's Pond and Namequoit River

Nature viewing is the primary activity of respondents for both Arey's Pond and the Namequoit River. Power boating and Canoeing/Kayaking are the second and third rated activities at both Arey's Pond and the Namequoit River.

*Q.2. How do you use Arey's Pond and Namequoit River?*

### Arey's Pond

	<i>Total</i>	<i>Tier 1</i>	<i>*Tier 2</i>	<i>*Tier 3</i>
Nature viewing	58%	60%	62%	57%
Power boating	41%	53%	19%	43%
Canoeing/ Kayaking	39%	43%	35%	33%
Shorewalking	30%	27%	31%	38%
Shellfishing	27%	20%	27%	43%
Sailing	27%	25%	27%	33%
Swimming	16%	16%	19%	10%
Finfishing	13%	12%	8%	19%
Beach activities	8%	4%	12%	14%
None of the above/ no answer	20%	22%	19%	15%

### Namequoit River

	<i>Total</i>	<i>Tier 1</i>	<i>*Tier 2</i>	<i>*Tier 3</i>
Nature viewing	72%	80%	69%	57%
Power boating	53%	74%	27%	38%
Canoeing/ Kayaking	49%	61%	39%	33%
Shellfishing	41%	51%	23%	38%
Shorewalking	40%	39%	42%	38%
Sailing	41%	59%	19%	24%
Swimming	29%	41%	19%	14%
Finfishing	26%	33%	19%	19%
Beach activities	16%	16%	15%	14%
None of the above/ no answer	13%	8%	15%	19%

*\*Note: Due to low number of responses in Tiers 2 and 3, please interpret results with caution.*

## Observations in Arey's Pond & Namequoit River

The increase in the number of boats is the number one observation on both Arey's Pond and the Namequoit River. Those in Tier 1 notice an increase in the murkiness of the water at both Arey's Pond and the Namequoit River more than those in Tiers 2 or 3.

*Q.3. What have you observed in Arey's Pond or Namequoit River?*

### Arey's Pond:

<i>Observation</i>	Percent indicating 'Often'			
	<i>Total</i>	<i>Tier 1</i>	<i>*Tier 2</i>	<i>*Tier 3</i>
Increased number of boats on the water	37%	35%	42%	33%
Increased murkiness of the water	17%	22%	12%	10%
Decrease in shellfish populations	14%	14%	8%	19%
Decline in eelgrass	9%	12%	8%	5%
Change in the number or variety of birds	4%	4%	8%	-
Decrease in fish population	5%	4%	12%	-
Foul odors at certain times	3%	4%	-	5%
Change in the number or variety of fish	3%	6%	-	-

### Namequoit River:

<i>Observation</i>	Percent indicating 'Often'			
	<i>Total</i>	<i>Tier 1</i>	<i>*Tier 2</i>	<i>*Tier 3</i>
<i>Increased number of boats on the water</i>	35%	39%	39%	29%
<i>Decrease in shellfish populations</i>	18%	24%	12%	14%
<i>Increased murkiness of the water</i>	12%	18%	8%	5%
<i>Decline in eelgrass</i>	10%	16%	8%	5%
<i>Decrease in fish population</i>	7%	8%	15%	-
<i>Change in the number or variety of birds</i>	6%	8%	8%	-
<i>Foul odors at certain times</i>	4%	4%	4%	5%
<i>Change in the number or variety of fish</i>	1%	4%	-	-

*\*Note: Due to low number of responses in Tiers 2 and 3, please interpret results with caution.*

## Assessment of Nitrogen Levels

Eighty-five percent of respondents indicate they are concerned with the increased level of nitrogen in Arey's Pond and eighty-six percent would support policies that would result in a decrease in nitrogen levels over time. Eighty-one percent of respondents indicate it is the responsibility of the property owner to help reduce levels of nitrogen, however, only 48% would be willing to modify their septic system to enhance its ability to remove nitrogen. Thirty-eight percent would support the development of neighborhood wastewater treatment and disposal options, and another forty-nine percent are unsure if they support it.

*Q.4 Is the increased level of nitrogen in Arey's Pond of concern to you?*

	<i>Total</i>	<i>Tier 1</i>	<i>*Tier 2</i>	<i>*Tier 3</i>
Yes	85%	83%	88%	85%
No	4%	-	4%	15%
Unsure	11%	17%	8%	-

*Q.5 Would you support policies that would result in a decrease in nitrogen levels over time?*

	<i>Total</i>	<i>Tier 1</i>	<i>*Tier 2</i>	<i>*Tier 3</i>
Yes	86%	85%	84%	90%
No	3%	-	4%	10%
Unsure	11%	15%	12%	-

*Q.6 Do you feel that you have a responsibility as a property owner in the area to help reduce levels of nitrogen?*

	<i>Total</i>	<i>Tier 1</i>	<i>*Tier 2</i>	<i>*Tier 3</i>
Yes	81%	83%	80%	75%
No	4%	2%	4%	10%
Unsure	15%	15%	16%	15%

*Q.7 Would you be willing to modify your septic system to enhance its ability to remove nitrogen?*

	<i>Total</i>	<i>Tier 1</i>	<i>*Tier 2</i>	<i>*Tier 3</i>
Yes	48%	43%	39%	68%
No	16%	20%	13%	11%
Unsure	36%	37%	48%	21%

*Q.8 Would you support the development of neighborhood wastewater treatment and disposal options (e.g., community septic systems, shared leaching fields)?*

	<i>Total</i>	<i>Tier 1</i>	<i>*Tier 2</i>	<i>*Tier 3</i>
Yes	38%	33%	29%	60%
No	13%	18%	4%	10%
Unsure	49%	49%	67%	30%

*\*Note: Due to low number of responses in Tiers 2 and 3, please interpret results with caution.*

## Nitrogen Issue Knowledge

Ninety-five percent of respondents will read materials sent to their house in order to learn more about this issue. A higher percentage of those in Tier 1 are willing to participate in a committee to explore options than those in either Tier 2 or 3.

*Q.9 In order to learn more about this issue, would you be willing to:*

	<i>Total</i>	<i>Tier 1</i>	<i>*Tier 2</i>	<i>*Tier 3</i>
Read materials sent to your home	95%	92%	96%	100%
Have an audit done of your septic system if at no cost	59%	61%	58%	57%
Attend local information meetings	56%	57%	65%	43%
Participate in a committee to explore options	16%	25%	8%	5%

*\*Note: Due to low number of responses in Tiers 2 and 3, please interpret results with caution.*

## Respondent Demographics

Over half of all respondents are year-round residents of Orleans. Nearly 60% have owned their property for 10 or more years and only 6% rent part or their entire house to others. Only 12% have a well and two-thirds have a Title 5 System. An average of 3 people resides at respondents' houses in the summer and 1.7 in the winter.

Q.10. How long do you reside in Orleans each year?

	<i>Percent of Respondents</i>
Weekends only	4%
Seasonally	33%
Year-round	55%
Not at all	1%
Property not developed	7%

Q.11. How long have you owned your property?

	<i>Percent of Respondents</i>
0 – 4 years	23%
5 – 9 years	21%
10 or more years	56%

Q.12. Do you rent all or part of your house to others?

	<i>Percent of Respondents</i>
Yes, seasonally	4%
Yes, year-round	2%
No, not at all	94%

Q.15. Do you have a well?

	<i>Percent of Respondents</i>
Yes	12%
No	88%

Q.13. On average, how many people reside in your house?

	<i>Percent of Respondents</i>	
	<i>June – September</i>	<i>October – May</i>
Zero	-	20%
One	11%	14%
Two	41%	52%
Three	17%	9%
Four	19%	5%
Five	8%	-
Six	2%	-
Ten	2%	-
<b>Average</b>	<b>3.0</b>	<b>1.7</b>

Q.14. Do you have one or more of the following?

	<i>Percent of Respondents</i>
Title 5 System	67%
Cesspool	18%
Other	5%
Don't know	12%

## Technical Appendices:

- Data Tables
- Survey