Economic Impact and Resident Valuation of the Boothbay Region Land Trust

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ECONOMIC IMPACT AND RESIDENT VALUATION OF THE BOOTHBAY REGION LAND TRUST

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Executive Summary:
Researchers from the University of Maine examined the economic impact and resident valuation of the hiking trails and surrounding open space preserved by the Boothbay Region Land Trust (BRLT). Based on 500 hours of fieldwork conducted on BRLT properties, the study estimated an overall count of 63,832 preserve uses between April and November of 2012. This count of individual uses translates into 13,081 unique users—251 are year-round residents, 864 are seasonal residents and 11,966 are visitors to the Boothbay region. A survey of BRLT preserve users suggests that those who are visitors to the region spend an average of $73.77 per day while in the area, while seasonal residents who use the BRLT preserves have an average of $57.94 in daily expenditures. The annual economic impact, including multiplier effects, of the expenditures made by BRLT users who are visitors or seasonal residents is an estimated $3.9 million in revenue, 39 full- and part-time jobs, and $1.1 million in labor income. This assumes that the visitors and seasonal residents are in the Boothbay region, at least for the days when the hiking trails are used, as a result of the BRLT preserves. A survey of year-round and seasonal residents of the Boothbay region found that people generally believe that open space is beneficial to the area. Based on the survey results, the study found that residents of the Boothbay region—including year-round and seasonal—have a collective willingness-to-pay of about $1.1 million per mile of hiking trails in the region, which translates into a value of $32.2 million for the 30 miles maintained by BRLT.

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ECONOMIC IMPACT AND RESIDENT VALUATION OF THE BOOTHBAY REGION LAND TRUST

1. BACKGROUND AND INTRODUCTION

The Boothbay Region Land Trust (BRLT) is a non-profit organization founded in 1980 with the following mission: "to conserve for the public benefit the natural habitat, scenic beauty and working land of the Boothbay Region."[2] With a volunteer-based Board of Directors and a small staff working out of an office located in Boothbay Harbor, BRLT receives funding from membership fees, donations, grants, and special events organized by the land trust. Hundreds of BRLT members augment the work of the staff through various volunteer activities. BRLT provides educational programs to the general public, and collaborates with the local schools and YMCA in providing youth environmental education. The land trust also partners with Boothbay area businesses in the "Adopt a Preserve" program.

BRLT maintains over 1,700 acres of land on more than twenty preserves that are available to the public at no charge for hiking and other recreational activities. BRLT preserves range in size from the one-acre Mill Pond Overlook to the 210-acre Damariscove Island. Though most of the land trust's holdings are properties on the "mainland" that are accessible by car, BRLT owns several islands that can only be reached by boat. The land trust maintains two working waterfront facilities (e.g., docks and boat ramps) that provide access to the water for recreational and traditional uses. BRLT partners with private landowners to provide additional public trails, beyond those

[2] Information on the Boothbay Region Land Trust comes from its website (www.bbrlt.org) and 2010 publication, *Take a Hike: Celebrating 30 Years and 30 Miles of Trails*.

that are owned by the land trust, and recreational access on private lands. From pebbly beaches to scenic ponds and deep spruce forests, visitors can enjoy a variety of landscapes while hiking the 30 miles of trails that are maintained by BRLT.

The objectives of this study are to: (1) estimate the number of times the BRLT preserves are used; (2) measure the economic impact of the preserves; and (3) determine the value that residents place on the hiking trails and surrounding open space maintained by the Boothbay Region Land Trust. Economic impact is measured in terms of the local expenditures of BRLT users who are visitors to the region or seasonal residents. These individuals spend money in the Boothbay Region that supports jobs, and provides wages and salaries to local workers. BRLT users who are permanent residents of the area are not counted in the economic impact analysis, but they benefit from the presence of the land trust. Resident—year-round and seasonal—valuation of the land trust is measured in terms of the willingness-to-pay for hiking trails. BRLT's economic impact and resident valuation are based on information from three research-based activities: (1) direct fieldwork at BRLT preserves to count the number of uses; (2) survey of BRLT users to determine their resident status (e.g., year-round resident, seasonal resident, visitor) and amount of spending in the Boothbay region; and (3) survey of year-round and seasonal residents to determine their willingness-to-pay for hiking trails and surrounding open space in the Boothbay region. These three activities are described in sections 2, 3 and 4 of the report, and section 5 provides a brief summary.

2. COUNTING THE NUMBER OF TIMES BRLT PRESERVES ARE USED

The first part of the project involved counting the number of uses at the preserves maintained by BRLT. This information is needed, along with data on the expenditures made by BRLT users who are visitors or seasonal residents, for the economic impact assessment. From early May through the end of October, the UMaine research team conducted 500 hours of direct fieldwork in order to count BRLT preserve uses—defined as an individual hiking or otherwise recreating/enjoying the property. The hours of fieldwork were divided among 21 BRLT properties, not including Damariscove Island.[3] Use counts were recorded in hour-long intervals, and members of the research team would typically spent three hours at a single preserve before moving on to another. For each hour of fieldwork, the preserve name, time of day, date, temperature and sky conditions were recorded. All days of the week were represented and counts occurred between the hours of 6am and 9pm.

The majority of preserves have one access point (e.g., a parking lot with a trail head) where all visitors—with the exception of adjacent land owners—can be observed entering the BRLT trails. At these preserves, members of the UMaine research team counted people mainly from the parking lot. However, some preserves have multiple access points, and at these sites use counts were taken while hiking the trail system to ensure that everyone would be observed. It is likely a small number of users were not counted, such as adjacent landowners who entered the preserves at access points other than the parking lot and users at preserves with multiple access points who may have been missed. Use counts at Damariscove Island were conducted through a separate

[3] As described below, BRLT caretakers counted preserve uses on Damariscove Island.

process. BRLT caretakers live on the island from late June through early September, and they were able to count every visitor to the island on the days when they were present.

While conducting the fieldwork, members of the research team distributed economic impact surveys to BRLT preserve users. Individuals in the field approached the visitor(s), briefly introduced the UMaine/BRLT study and asked the visitor(s) to accept a survey to complete at a later time and return to the University of Maine. Only one questionnaire was given to each party and surveys were not provided to visitors under 18 years old. After conducting fieldwork for several months, many visitors approached near the end of the season had already completed and returned surveys, and they were not asked to fill out an additional survey. As described below, a survey question asking about frequency of use allows us to account for these "repeat users."

After completing the fieldwork, a regression analysis was performed on the use count data.[4] This statistical analysis served to identify the influence of different factors on the number of people observed at BRLT preserves. In other words, how much did the time of day, day of the week, or month influence the number of people using BRLT preserves? Do certain preserves receive more use than others? What impact did the weather have? The regression analysis isolates the effects that the specific preserve, day of the week, time of day, month and weather conditions have on the amount of use.

Tables 1 through 11 present information on use counts and, when applicable, how each of the different factors—the specific preserve, day of the week, hour of the day, sky condition, temperature and month—influence the number of users observed. Two tables are presented for each factor. The first table has two columns: *Hours of Fieldwork* and

[4] A Poisson regression framework is used, which is appropriate given the count nature of the use data.

Average Hourly User Count. The *Hours of Fieldwork* column shows how the 500 hours of fieldwork were distributed within each factor, such as how many hours were spent at each preserve, or how the fieldwork hours were divided among the days of the week. Although the 500 hours of fieldwork are not typically divided evenly within each of the factors—e.g., some of the preserves have more hours of fieldwork than others—the data are weighted later in the analysis so that the overall user counts are representative of an "average" hour of fieldwork.

Table 1. Average Hourly Use Counts by BRLT Preserve

Preserve	Hours of Fieldwork	Average Hourly Use Count
Porter Preserve & Roberts Wharf	58	6.33
Penny Lake Preserve	50	4.02
Linekin Trail	33	2.12
Ovens Mouth East	31	2.03
Ocean Point Preserve	16	1.88
Gregory Hiking Trail	41	1.68
Mill Pond Overlook	18	1.50
Ovens Mouth West	26	1.46
Lobster Cove Meadow Preserve	18	0.89
Thorpe Easement	13	0.85
Appalachee Preserve	14	0.71
Zak Preserve	26	0.65
Singing Meadows Preserve	24	0.63
Hendricks Head Hiking Trail	23	0.48
Pine Tree Property	16	0.31
Colby Wildlife Preserve	24	0.29
River Link	20	0.25
Spectacle & Indiantown Islands	12	0.25
Saunders Preserve	17	0.18
School House Pond Preserve	20	0.15
Damariscove Island	NA	NA
sum	500	

Notes. Average hourly use counts are calculated as the quotient of the total number of uses counted at the preserve divided by the hours of fieldwork at the preserve.

The *Average Hourly User Count* column divides the total number of uses observed by the hours of fieldwork performed. This provides a convenient way to examine BRLT preserve use, although the average use counts for a particular factor (e.g., hour of the day) could be influenced by another (e.g., temperature). If, by coincidence, all of the fieldwork conducted between 3pm and 4pm took place on days with temperatures in the 70s, the high use counts attributed to the time of day could be, in this example, explained by the mild temperatures. This is why we conduct the regression analysis.

The second table for each variable presents results of the regression analysis. As described above, this method isolates the impact of each factor from the other variables that may influence preserve use. For example, Table 1 shows substantial differences in use among the preserves, with Porter / Roberts Wharf, Penny Lake, Linekin Trail and Ovens Mouth East each averaging over two uses per hour and School House Pond and Saunders each averaging fewer than one use per five hours of fieldwork. This table, by itself, does not show whether these differences in use can be attributed to the specific preserves themselves, or other factors that may have differed when members of the research team were conducting the fieldwork. The regression analysis summarized in Table 2, however, accounts for all of the other factors influencing use to isolate the effect of a given preserve. The *Effect of Preserve* column indicates if it has more (positive effect) or fewer (negative effect) uses per hour, as compared to the others. The regression analysis tables only list factors for which the effect—either positive or negative—is statistically significant at a 5-percent level. In the context of Table 2, an effect from the regression analysis that is not statistically significant means that the number of uses at a particular preserve does not differ from the others.

As shown in Table 2, the average number of uses counted at Porter Preserve, Penny Lake Preserve and Linekin Trail are significantly higher than those observed elsewhere. In other words, they received significantly more uses, controlling for other factors such as day of the week and weather conditions, as compared to the other preserves. Eight of the preserves, listed in Table 2, received significantly fewer uses when each was compared to the others. The remaining nine preserves where members of the research team conducted fieldwork are not listed in Table 2, which means that they do not differ in use counts when compared to the other preserves. When a preserve is indicated as having a statistically significant effect, we can express confidence that the difference in use counts between it and the other preserves is due to the preserve itself, and not random chance or other factors that influence use.

Table 2. BRLT Preserves with a Statistically Significant Effect on Use

Preserve	Statistically Significant?	Effect of Preserve
Porter Preserve & Roberts Wharf	yes	positive
Penny Lake Preserve	yes	positive
Linekin Trail	yes	positive
Appalachee Preserve	yes	negative
Singing Meadows Preserve	yes	negative
Pine Tree Property	yes	negative
Colby Wildlife Preserve	yes	negative
River Link	yes	negative
Spectacle & Indiantown Islands	yes	negative
Saunders Preserve	yes	negative
School House Pond Preserve	yes	negative

Notes. The "effect of preserve" is from a regression analysis that controls for the day of week, hour of day, sky condition, temperature and month when the use counts were conducted. Statistical significance is determined at a 5-percent level. An effect that is not statistically significant means that it does not differ from the other preserves.

The preserves indicated in Table 2 as having a positive effect on use confirm the observations of members of the research team, which suggest a few of the preserves seem to be considerably more popular than the others. It is likely that the presence of ocean views on Porter Preserve and Linekin Trail contributes to higher use and these preserves are also relatively better known to visitors due to their inclusion in regional tourism and hiking guides. The popularity of Penny Lake may be due to its ADA accessible trail and location in one of the busiest parts of the region, within walking distance of a retirement community. Likewise, the preserves listed as having a negative effect on use do not come as a surprise to members of the research team. Although people were encountered at all of the preserves over the course of the season, the fieldwork yielded counts of "zero uses" for many of the hours at these preserves. As noted above, the preserves that are missing from Table 2, with the exception of Damariscove Island that was not covered by the UMaine research team, are the more moderately used preserves as compared to the rest.

Tables 3 and 4 present information on how the average hourly use counts varied by day of the week. Table 3 shows the distribution of fieldwork hours by day, and counts that indicate an average of more than 2.5 uses per hour on Tuesdays and Fridays. Regression results summarized in Table 4 suggest that Mondays and Tuesdays have significantly higher use counts when compared with all the other days of the week. None of the other days have a significant effect—positive or negative—on the number of people using the preserves. Comparing the results of Tables 3 and 4 may seem counterintuitive at first. For instance, Friday has an average of 2.51 uses per hour (compared to 1.76 on Mondays), but it is not identified as having a positive effect on use

in Table 4. Recall the earlier discussion on the regression analysis and how it can isolate the effect of each variable from the others. Friday could have a higher average use count than Monday (Table 3) and not have a positive effect on usage (Table 4) if, coincidentally, members of the research team visited Porter Preserve and/or Penny Lake Preserve more often on Fridays, or if Fridays were sampled more often on "nice weather days" or during the month of August.

Table 3. Average Hourly BRLT Use Counts by Day of the Week

Day of Week	Hours of Fieldwork	Average Hourly Use Count
Sunday	39	1.21
Monday	94	1.76
Tuesday	67	3.06
Wednesday	112	1.77
Thursday	52	1.60
Friday	86	2.51
Saturday	50	1.14
sum	500	

Notes. Average hourly use counts are calculated as the quotient of the total number of uses counted for a given day of the week divided by the hours of fieldwork for that day. Use counts for Damariscove Island are not included in this analysis.

Table 4. Days of the Week with a Statistically Significant Effect on Use

Day of Week	Statistically Significant?	Effect of Day
Monday	yes	positive
Tuesday	yes	positive

Notes. The "effect of day" is from a regression analysis that controls for the preserve, hour of day, sky condition, temperature and month when the use counts were conducted. Statistical significance is determined at a 5-percent level. An effect that is not statistically significant means that it does not differ from the other days of the week. Use counts for Damariscove Island are not included in this analysis.

Tables 5 and 6 present information on how BRLT preserve use varies by time of the day. The average hourly counts reveal considerable variation in use over the course of the day. When the effects of other factors affecting use are accounted for, the hours of 10am and 3pm appear to be peak times (i.e., positive and significant effect) of preserve visitation, while use experiences a drop off in the later evening hours starting at 6pm.

Table 5. Average Hourly BRLT Use Counts by Hour of the Day

Hour of the Day	Hours of Fieldwork	Average Hourly Use Count
Before 8am	6	0.83
8am	8	1.00
9am	36	0.94
10am	54	2.76
11am	69	2.99
Noon	67	2.37
1pm	56	1.45
2pm	60	2.13
3pm	64	1.61
4pm	43	1.16
5pm	25	0.88
6pm or later	12	2.17
sum	500	

Notes. Average hourly use counts are calculated as the quotient of the total number of uses counted for a given hour of the day divided by the hours of fieldwork for that hour. Use counts for Damariscove Island are not included in this analysis.

Table 6. Hours of the Day with a Statistically Significant Effect on Use

Hour of the Day	Statistically Significant?	Effect of Hour
10am	yes	positive
3pm	yes	positive
6pm or later	yes	negative

Notes. The "effect of hour" is from a regression analysis that controls for the preserve, day of the week, sky condition, temperature and month when the use counts were conducted. Statistical significance is determined at a 5-percent level. An effect that is not statistically significant means that it does not differ from the other hours of the day. Use counts for Damariscove Island are not included in this analysis.

Information on the effects of weather on BRLT preserve use is presented in Tables 7, 8 and 9. The average hourly use counts (Table 7) show that visitation tapered off as the sky moved from sun to clouds to rain. Results of the regression analysis, however, do not indicate that any of the sky condition variables have a significant effect on use (so no additional table is presented). Intuition would suggest a drop off in preserve visitors in the rain, and the precipitation variable has a negative effect on use at a 7-percent significance level (which is just above the threshold of 5-percent used to indicate statistical significance). During many of the sampling hours in which precipitation was recorded, there was a light drizzle rather than a heavy rain. If more counts were taken during heavy rainstorms, we would have likely found that precipitation has a negative (and statistically significant) effect on preserve use. As shown in Table 9, the BRLT preserves experience less use—controlling for other factors such as the month of the year—when the air temperature is in the 60s, and they are more heavily used when the temperature is in the 70s.

Table 7. Average Hourly BRLT Use Counts by Sky Condition

Sky Condition		Hours of Fieldwork	Average Hourly Use Count
Sunny		253	2.52
Mostly sunny / partly cloudy		97	1.92
Cloudy		119	1.14
Precipitation		31	0.39
	sum	500	

Notes. Average hourly use counts are calculated as the quotient of the total number of users counted for a given sky condition divided by the hours of fieldwork for that condition. Use counts for Damariscove Island are not included in this analysis.

Table 8. Average Hourly BRLT Use Counts by Temperature

Temperature		Hours of Fieldwork	Average Hourly Use Count
Less than 50 degrees		11	0.64
50s		68	1.57
60s		137	0.93
70s		229	2.62
Above 79 degrees		55	2.36
	sum	500	

Notes. Average hourly use counts are calculated as the quotient of the total number of uses counted for a given temperature range divided by the hours of fieldwork for that temperature range. Use counts for Damariscove Island are not included in this analysis.

Table 9. Temperature Ranges with a Statistically Significant Effect on Use

Temperature	Statistically Significant?	Effect of Temperature
60s	yes	negative
70s	yes	positive

Notes. The “effect of temperature” is from a regression analysis that controls for the preserve, day of the week, hour of the day, sky conditions and month when the use counts were conducted. Statistical significance is determined at a 5-percent level. An effect that is not statistically significant means that it does not differ from the other temperature ranges. Use counts for Damariscove Island are not included in this analysis.

Tables 10 and 11 present information on the average hourly use of BRLT preserves by month of the year. Fieldwork was conducted from the beginning of May through the end of October, and the average hourly use counts were the highest in July (3.17) and August (2.59). As shown in Table 11, August had significantly higher use counts as compared to the other months of fieldwork—while the BRLT preserves experienced relatively less use in July (controlling for other factors included in the regression model). This may seem surprising given that the average use count for July was higher than those for all other months. It does not mean, however, that July had the least amount of use, or even lower counts of people than other months. The regression result pertaining to the month of July can be interpreted as meaning that this month had lower use counts considering the preserves that were sampled (and the days and times the fieldwork was conducted) and, perhaps most importantly, the weather conditions.

Table 10. Average Hourly BRLT Use Counts by Month

Month		Hours of Fieldwork	Average Hourly Use Count
May		77	1.09
June		57	0.89
July		121	3.17
August		82	2.59
September		91	1.38
October		72	1.58
	sum	500	

Notes. Average hourly use counts are calculated as the quotient of the total number of users counted for a given month divided by the hours of fieldwork for that month. Use counts for Damariscove Island are not included in this analysis.

Table 11. Months with a Statistically Significant Effect on Use

Month	Statistically Significant?	Effect of Month
July	yes	negative
August	yes	positive

Notes. The "effect of month" is from a regression analysis that controls for the preserve, day of the week, hour of the day, sky conditions and temperature when the use counts were conducted. The negative effect associated with the month of July means that the number of uses counted in the month is less than what would be expected given the preserves where use counts were conducted, and the days, times and weather conditions (i.e., sky conditions and temperature) when use counts were conducted. Statistical significance is determined at a 5-percent level. An effect that is not statistically significant means that it does not differ from the other months. Use counts for Damariscove Island are not included in this analysis.

Table 12 compares the average high temperatures and lodging sales in the region for the months of May through October. July has the warmest average high temperature, which suggests that this month has the potential to be the busiest in terms of preserve use. Although the Damariscotta Economic Summary Area, which includes Boothbay, generates over $6.0 million in taxable lodging sales in July—indicative of a large number of visitors in the area—tourism activity is even higher in August. The combination of the warmest average high temperature along with slightly lower lodging sales than the month of August means that the BRLT preserves experience less visitation than would be expected in July (based on weather conditions and other factors accounted for in the regression analysis). In other words, the negative effect associated with the month of July means that, given other favorable conditions that existed when use counts were taken during this month, we would have expected more visitors than were actually observed.

Table 12. Monthly Temperature and Lodging Sales Data for the Boothbay Region

Month	Average High Temperature	Lodging Sales
May	65	$984,157
June	73	$3,674,643
July	78	$6,276,757
August	76	$6,724,229
September	68	$4,381,057
October	56	$1,535,271

Notes. Average high temperature values (www.weather.com) are for the town of Boothbay, Maine. Monthly taxable lodging sales data, reported by Maine Revenue Services, are 2004 to 2010 average values for the Damariscotta Economic Summary Area.

Using data collected through the fieldwork and results of the regression analysis, we estimated an aggregate monthly count of uses at BRLT preserves. Table 13 presents estimated use figures for all the non-winter months. The estimates for the months of May through October are based exclusively on the use counts observed by members of the research team, although the results are weighted so that the influences of uneven sampling are erased. For example, since members of the research team conducted 33 hours of fieldwork at Linekin Trail and only 17 hours at Saunders Preserve, higher weights are applied to the observations from the time spent at Saunders Preserve. While we did not conduct fieldwork in April or November, we can estimate use counts for these months using the data collected between May and October and a regression model that includes the factors discussed above and information on monthly lodging sales. A total count of 60,720 uses is estimated between April and November for the 21 BRLT preserves (excluding Damariscove Island) where members of the UMaine research team conducted fieldwork.

Table 13. Estimated BRLT Use Counts by Month

Month	Estimated Uses
April	1,768
May	6,810
June	5,702
July	12,838
August	19,202
September	6,058
October	6,311
November	2,031
Sum	60,720

Notes: Figures for the months of May through October are based on hourly use counts that are weighted by the number of hours of fieldwork conducted by preserve, day of the week, hour of the day, and month. For example, use counts at preserves with greater numbers of observations receive lower weights than counts at preserves with fewer hours of counts. Figures for April and November are estimated using the hourly use counts and a regression model that controls for the preserve, day of week, hour of day, sky condition, temperature, and amount of monthly taxable lodging sales. The lodging sales variable, available from Maine Revenue Services, is used to indicate the presence of tourists in the region, found to have a positive and statistically significant effect on use counts. Use counts for Damariscove Island are not included in this analysis.

Use counts for Damariscove Island are presented in Tables 14, 15 and 16. On Damariscove Island, the caretakers who lived on the property were able to count people visiting the island on every day they were present from late June to early September. Table 14 indicates heavier weekend use on Damariscove Island, in contrast to the other preserves that experience more use on Mondays and Tuesdays. This may be due to the fact that Damariscove Island is only accessible by boat so that a greater time commitment is needed to reach it. Other preserves were frequently visited by local and seasonal residents walking their dogs for less than an hour. Table 15 shows average daily use counts on Damariscove Island by month and, given the few number of days covered in June and September, estimated use counts for June and September are presented in Table 16.

Table 14. Average Daily Damariscove Island Use Counts by Day of the Week

Day of Week		Days of Use Counts	Average Daily Use Count
Sunday		11	41.73
Monday		9	25.00
Tuesday		9	23.67
Wednesday		9	22.56
Thursday		9	22.00
Friday		11	34.45
Saturday		11	57.82
	sum	69	

Notes. Average daily use counts are calculated as the quotient of the total number of uses counted for a given day of the week divided by the number of days of use counts.

Table 15. Average Daily Damariscove Island Use Counts by Month

Month		Days of Use Counts	Average Daily Use Count
June		9	13.78
July		26	32.81
August		31	36.97
September		3	63.33
	sum	69	

Notes. Average daily user counts are calculated as the quotient of the total number of users counted for a given month divided by the number of days of user counts.

Table 16. Estimated Damariscove Island Use Counts by Month

Month	Estimated Uses
June	392
July	1,017
August	1,146
September	556
Sum	3,112

Notes: Figures for the months of July and August are based on daily use counts. Figures for June and September are estimated using the daily use counts and information on use counts by month for BRLT preserves other than Damariscove Island.

Table 17 presents estimates for total use counts on BRLT preserves from April through November of 2012. The estimates for Damariscove Island were added to the use counts for the other preserves (Table 13) to arrive at these figures. There were an estimated 63,832 uses of BRLT preserves during the non-winter months of 2012. Numbers peaked in August at 20,348 visitors, and were very high in July with an estimated 13,855 uses. The months of May, June, September and October experienced similar usage, with between 6,000 and 7,000 visitors, while the lowest amounts of use occurred in April and November.

Table 17. Estimated Overall BRLT Use Counts by Month, including Damariscove Island

Month	Estimated Uses
April	1,768
May	6,810
June	6,094
July	13,855
August	20,348
September	6,615
October	6,311
November	2,031
Sum	63,832

Notes: Figures are the sum of the values shown in Tables 13 and 16.

3. ECONOMIC IMPACT OF BRLT USERS

The second main part of the project is a survey of BRLT users to determine their resident status and amount of expenditures they made in the Boothbay region. This information, along with the estimated use counts from the fieldwork described above, is used to estimate the economic impact of BRLT users who are visitors to the region and seasonal residents. As shown in Table 18, a total of 541 surveys were distributed to BRLT preserve users by members of the UMaine research team and the caretakers living on Damariscove Island. About 42 percent of the questionnaires—226 surveys to be exact—were returned by mail to the University of Maine. Along with asking questions about the respondent's resident status and expenditures made while in the Boothbay region, the survey also collected information about BRLT preserve use and the respondent's demographic characteristics.

Table 18. BRLT User Surveys and Response Rate

	Count
Surveys distributed	541
Surveys returned	226
Response rate	41.8 percent

BRLT Preserve Use and User Demographic Characteristics

The first question on the survey presented a list of all BRLT preserves and asked respondents to indicate the preserves they had visited in the past year. This information is presented in Table 19 alongside the average hourly use counts from Table 1 allowing a comparison between what members of the UMaine research team observed during their fieldwork and the preserves that survey respondents indicate using. A glance through the list of preserves on Table 19 shows these numbers largely coincide. For example Porter Preserve (and Roberts Wharf) received the highest average use counts based on the observations of the research team, and the highest percentage of survey respondents who said they had visited it.

Most of the preserves where members of the research team observed few visitors—such as Pine Tree Property, Colby Preserve and River Link—similarly received few check marks next to their names on the surveys. The correlation coefficient presented at the bottom of Table 19 reveals a very close alignment of the two measures of preserve use. A value of 0.82 suggests a strong positive correlation between the percent of respondents who said they used each preserve and the number of uses counted at each preserve. If the correlation had been 1.0, it would imply perfect agreement between the two measures.

Table 19. Reported Use of BRLT Preserves (n= 219)

Preserve	% of Respondents Who Used within Past Year	Average Hourly Use Count
Porter Preserve & Roberts Wharf	55.71%	6.33
Penny Lake Preserve	32.42%	4.02
Linekin Trail	26.48%	2.12
Ovens Mouth East	45.66%	2.03
Ocean Point Preserve	29.68%	1.88
Gregory Hiking Trail	24.20%	1.68
Mill Pond Overlook	12.33%	1.50
Ovens Mouth West	33.79%	1.46
Lobster Cove Meadow Preserve	14.61%	0.89
Thorpe Easement	4.11%	0.85
Appalachee Preserve	6.85%	0.71
Zak Preserve	25.69%	0.65
Singing Meadows Preserve	10.96%	0.63
Hendricks Head Hiking Trail	9.13%	0.48
Pine Tree Property	4.11%	0.31
Colby Wildlife Preserve	5.94%	0.29
River Link	3.20%	0.25
Spectacle & Indiantown Islands	13.70%	0.25
Saunders Preserve	9.59%	0.18
School House Pond Preserve	15.07%	0.15
Damariscove Island	36.99%	NA
Correlation	0.82	

Notes. Average hourly use counts, reproduced from Table 1, are calculated as the quotient of the total number of uses counted at the preserve divided by the hours of fieldwork at the preserve.

Table 20 presents information on the frequency of BRLT preserve use. About one-third of survey respondents were first time visitors to BRLT preserves when they received their surveys, and roughly one-quarter visited preserves "once or twice a year." The remaining respondents (about 45 percent) visited several times a year or more, including about 13 percent who visited "almost daily." It is interesting to note that, as described later in the report, almost 50 percent of the survey respondents were visitors to the Boothbay region, who accounted for the majority of first time users and those who indicated they use the trails "once or twice a year." Analysis of the surveys returned by

Boothbay residents—either year-round or seasonal—shows that only 9 percent and 10 percent of the respondents were first-time users and those who fell into the "once or twice a year category," respectively. By the end of the season, some BRLT preserve users began to look familiar to members of the research team, and it became more difficult to distribute surveys because many visitors said they had already received one.

Table 20. Frequency of BRLT Preserve Use (n = 221)

Frequency of Use	% of Respondents
First time	30.77%
Almost daily	12.67%
Once or twice a week	8.60%
Once or twice a month	4.98%
Several times a year	19.00%
Once or twice a year	23.98%
	100.00%

Data on the typical group size of users at BRLT preserves are summarized in Table 21. The most common party sizes were 2 and 3 people—together these categories accounted for 63 percent of the survey responses. Only about seven percent of the survey respondents indicated that they were usually alone when they visited the preserves. Observations from members of the research team suggest that many—almost all—of these single visitors were hiking with one or more dogs.

Table 21. Typical Size of Group Using BRLT Preserves (n = 217)

Group Size	% of Respondents
One person	7.37%
Two people	30.41%
Three people	32.72%
Four people	12.44%
Five or more people	17.05%
	100.00%
Average group size	3.19

Table 22. Resident Status of BRLT Preserve Users (n = 219)

Resident Status	% of Respondents
Year-round resident of Boothbay Region	26.94%
Seasonal resident of Boothbay Region	26.48%
Visitor from elsewhere in Maine	8.22%
Visitor from outside of Maine	38.36%
	100.00%

Notes. Visitors include day-use and overnight visitors

Table 22 presents information on the resident status of BRLT preserve users. Tourists from outside Maine make up the highest percentage of users—about 38 percent of survey respondents are out-of-state visitors. Many of the preserves are located in more remote parts of the region and are not visible from the main driving routes. The heavy use by visitors, despite the fact that preserves are often "hard to find," suggests that tourists are receiving information about BRLT preserves, whether it be through Internet searches, guidebooks, lodging staff or brochures they pick up during their trip. Year-round and seasonal Boothbay region residents responded to the survey in almost equal percentages

(27.0 percent and 26.5 percent, respectively), while visitors from elsewhere in Maine made up only eight percent of the respondents.

Table 23 shows that more than one-half of the survey respondents are females—56 percent compared to 44 percent for males. This does not necessarily mean, however, that females are more avid preserve users. As noted above, most visitors were in groups of two or more people, but only one survey was given to each party. The higher percentage of female respondents could simply indicate that more females filled out the surveys (for their entire group) than males. Data for the United States as a whole show that males participate in outdoor recreation at a higher rate than females (Outdoor Foundation, 2012). If the higher share of females responding to the survey were indeed a matter of more female visitors, this would be counter to the general trend nationwide.

Table 23. Gender of BRLT Preserve Users (n = 221)

Gender	% of Respondents
Female	56.11%
Male	43.89%
	100.00%

The age distribution of (adult) BRLT preserve users is shown in Table 24. Individuals under the age of 18 were not given surveys, so the age profile of users does not represent the infants, children and teenagers who visited the preserves—although they are included in the overall use counts (and the economic impact analysis). Results of the survey indicate that visitation to BRLT preserves by older adults was quite high. Almost one-half of the survey respondents (45 percent) belong to the "60 to 74 year-old" age

cohort, and another 36 percent are between the ages of 45 and 59 years old. This is somewhat unexpected considering other studies on outdoor recreation participation by age cohort. For example, the recent Maine State Comprehensive Outdoor Recreation Plan (MESCORP 2009-2012) reported data collected by the U.S. Forest Service on Maine residents' participation by age in a variety of outdoor recreation activities. For many activities, the highest proportion of participants came from the 35-44 year-old group, with declining participation in the older age groups. A relevant example is day hiking: 26 percent of the day hiking participants were 35-44, 18 percent were 45-54, 8 percent were 55-64, and 12 percent were 65 or older (Maine Department of Conservation, 2009). The decline in outdoor recreation participation with age has been documented by the Outdoor Foundation's national outdoor recreation surveys as well (Outdoor Foundation, 2012).

Table 24. Age Profile of BRLT Preserve Users (n = 218)

Age	% of Respondents
18 to 29 Years	3.67%
30 to 44 Years	9.17%
45 to 59 Years	35.78%
60 to 74 Years	45.41%
Over 75 Years	5.96%
	100.00%
Average age	58.04

The robust visitation to BRLT preserves by older adults can likely be explained, in part, by the demographics of the region. U.S. Census statistics show that 28.8 percent of the population is 65 years or older in the town of Boothbay Harbor. Lincoln County,

which includes the Boothbay region, has 22.3 percent of the population in the 65 years or older cohort, compared to 16.3 percent and 13.3 percent of the Maine and United States populations, respectively (U.S. Census Bureau, 2012). Looking at information on tourists, Maine overnight visitors have an average age of 46 years old (Maine Department of Conservation, 2009), which is higher than the comparable figure for the U.S. population. In addition to the fact that older adults make up a relatively high percentage of area residents and Maine tourists, it is possible that older preserve visitors were more likely to fill out surveys than younger users.

Table 25. Educational Attainment of BRLT Preserve Users (n = 218)

Highest Level of Formal Education	% of Respondents
Less than high school	0.00%
High school degree	10.09%
2-year college degree	7.34%
4-year college degree	39.45%
MA/MS degree	22.02%
Ph.D./professional degree	21.10%
	100.00%

Table 25 presents information on the distribution of BRLT preserve users by (highest) level of formal education. Every survey respondent has (at least) a high school diploma, and the most common level of educational attainment is a 4-year college degree (39 percent). The numbers are perhaps most striking when those with a 4-year degree are combined with respondents indicating a post-graduate degree. The vast majority of survey respondents (83 percent) report having a 4-year degree or additional years of formal education. The share of survey respondents with at least a 4-year college degree

is much higher than the same figure for the general population of Maine (26.5 percent) and the United States (27.9 percent) (U.S. Census Bureau, 2012).

Several factors explain the high educational attainment of BRLT preserve users. First, Lincoln County has a relatively high share of the population (31.6 percent), compared to the state as a whole, with at least a BA/BS degree (U.S. Census Bureau, 2012). Second, information on overnight visitors to Maine in 2011 indicates that 79 percent of these tourists have a college degree or more formal education (Davidson-Peterson Associates, 2012). It is likely that the high education levels of county residents and, especially, Maine tourists are contributing to the high college attainment rate of BRLT users, but an additional force may be at work. Studies show that Americans with higher levels of education are more frequent participants in outdoor recreation (Maine Department of Conservation, 2009; Outdoor Foundation, 2012). Therefore, the higher education levels of the Boothbay region and Maine tourists, combined with the greater likelihood of the highly educated to participate in outdoor recreation all likely contribute to the high educational attainment of BRLT users.

The distribution of BRLT users by annual household income category is shown in Table 26. The highest percentage of survey respondents (34 percent) is in the income bracket of $150,000 or more, and the vast majority of survey respondents (86 percent) indicated household incomes of $50,000 or higher. Similar to the results on the educational attainment of BRLT users, these household income figures are considerably different than those for the population at large. For the period of 2006-2010, Maine households had a median income of $46,933, lower than the corresponding figures for the overall United States ($51,914) and Lincoln County ($47,678) (U.S. Census Bureau,

2012). Looking at data on Maine tourists, we find that 74 percent of overnight visitors to the state in summer 2011 reported household incomes of $50,000 or higher (Davidson-Peterson Associates, 2011). As with an individual's level of formal education, income has been shown to be positively associated with outdoor recreation participation and park visitation (Maine Department of Conservation, 2009).

Table 26. Annual Household Income of BRLT Preserve Users (n = 191)

Annual Household Income	% of Respondents
Less than $25,000	5.76%
$25,000 to $49,999	8.38%
$50,000 to $74,999	16.23%
$75,000 to $99,999	18.85%
$100,000 to $149,999	17.28%
$150,000 or more	33.51%
	100.00%

Table 27 presents information on the state of residence of BRLT preserve users. About 38 percent of users indicated Maine as their state of residence, which is only slightly higher than the percentage of users who indicated they were year-round residents of the Boothbay Region or visitors from elsewhere in Maine (see Table 22). The majority of seasonal residents, therefore, identified another state as their primary residence. Massachusetts was the state identified by the next highest percentage of respondents (11 percent), followed by Florida (8 percent), New York (7 percent), New Hampshire (5 percent) and Vermont (3 percent). Overall, 29 states (and the District of Columbia) were indicated by BRLT preserve users, although nine of the states were represented by only one respondent each.

Table 27. State of Residence of BRLT Preserve Users (n = 219)

State	% of Respondents
Maine	38.36%
Massachusetts	11.42%
Florida	8.22%
New York	6.85%
New Hampshire	4.57%
Vermont	3.20%
California	2.74%
Connecticut	2.28%
Maryland	2.28%
New Jersey	2.28%
Rhode Island	1.83%
Colorado	1.37%
Georgia	1.37%
Minnesota	1.37%
North Carolina	1.37%
Ohio	1.37%
Pennsylvania	1.37%
Tennessee	1.37%
Virginia	1.37%
Missouri	0.91%
Arizona	0.46%
District of Columbia	0.46%
Hawaii	0.46%
Iowa	0.46%
Kentucky	0.46%
Oregon	0.46%
South Carolina	0.46%
Texas	0.46%
Wisconsin	0.46%
	100.00%

A comparison of these findings with Maine Office of Tourism data (Davidson-Peterson Associates, 2011) shows some similarity between Maine overnight visitors and the BRLT survey respondents. Massachusetts and New York were the top two states of residency for Maine overnight visitors in the summer of 2011. Florida is not included among the top 12 states for Maine overnight visitors, thus differing from BRLT preserve users where Floridians played a prominent role. Additional analysis of the survey data,

however, shows that more of the BRLT preserve users from Florida are seasonal residents rather than overnight visitors. Not a single Canadian filled out a BRLT user survey, while Maine overnight visitor data (Davidson-Peterson Associates, 2011) place New Brunswick, Ontario and Quebec among the top 12 states/provinces. A possible reason why tourists from Canada are not included among the survey respondents is that very few used the BRLT preserve. Information from the Maine Office of Tourism shows that 50 percent of overnight tourists from Canada indicated shopping as the primary purpose of their trip, compared to just 11 percent of those visiting Maine from other states. Members of the research team observed a small number of Canadian and other international travelers at the preserves. It is possible that, for some, the language barrier and the fact that the surveys were marked 'no postage necessary if mailed in the United States' were deterrents to returning the questionnaire.

Economic Impact Assessment

Economic impact is defined as the output (i.e., sales revenue), employment and labor income (e.g., wages and salaries) that are related to the direct spending of BRLT preserve users who are visitors and seasonal residents, as well as the multiplier effects that are supported by the spending of businesses (e.g., hotels, retail stores, restaurants) and workers that are impacted by the direct spending. The economic impact analysis is completed in three steps: (1) estimating the number of BRLT users who are visitors and seasonal residents; (2) estimating the average daily expenditures of visitors and seasonal residents who use the BRLT preserves; and (3) estimating the direct impact and multiplier effects supported by the spending of these users.

Table 28 shows the estimated BRLT preserve use counts and number of unique users by resident status. Of the estimated 63,832 uses over the period of April to November, we estimate that 27,960 are associated with visitors to the Boothbay region and 15,899 are associated with seasonal residents. These values are calculated as the product of the estimated number of BRLT preserve uses between May and October multiplied by the percentage of survey respondents who are visitors to the region—from elsewhere in Maine or outside the state—and seasonal residents. The remaining 19,972 uses are accounted for by year-round residents, which include 27 percent of the total uses between May and October, and all of the estimated uses in April and November.[5]

Table 28. Estimated Unique BRLT Preserve Users

Resident Status	Use Counts	Unique Users	% of Users
Year-round residents	19,972	251	1.92%
Seasonal residents	15,899	864	6.61%
Visitors	27,960	11,966	91.47%
	63,832	13,081	100.00%

Notes: Use counts for seasonal residents and visitors (day-use and overnight) are estimated as the product of the percentage of users by resident status multiplied by the total number of uses between May and October. The use count for year-round residents is estimated as the product of the percentage of year-round resident users multiplied by the total number of uses between May and October, plus the estimated number of uses in April and November. The number of unique users is estimated as the quotient of the use counts divided by the number of times respondents of the resident status category reported using the trails. For example, seasonal residents reported using the trails an average of 18.4 times during their stay, and visitors reported using the trails an average of 2.34 times during their visit.

[5] Lodging sales in the Damariscotta Economic Summary Area are substantially lower in April compared to May, and November compared to October—suggesting a relative absence of tourists in these months.

The estimated 27,960 and 15,899 BRLT preserve uses associated with visitors and seasonal residents translate into 11,966 and 864 unique users, respectively. The differences between the use counts and unique users are explained by the fact that visitors and seasonal residents reported using the BRLT preserves an average of 2.34 and 18.4 times, respectively, during their stays in the Boothbay region. Although year-round residents account for 31 percent of the estimated uses between April and November, they make up just two percent of the unique users. Using information similar to what is presented in Table 20, we estimate that year-round residents—who use the BRLT preserves—visit them an average of 79.6 times over an eight-month period (i.e., April to November).

Table 29. Estimated Per Person Daily Expenditures of BRLT Users: Visitors

Expenditure Category	Estimated Daily Spending
Lodging	$34.84
Restaurant meals	$15.66
Food and beverages at stores	$7.74
Gasoline / transportation	$4.49
Retail purchases / souvenirs	$7.27
Entertainment / recreation	$3.47
Personal services	$0.10
Other	$0.20
total	$73.77

Notes: The expenditure figures are weighted averages of the amounts spent by day-use and overnight visitors. Spending figures are interpreted as the average amount of daily expenditures per BRLT preserve user who reports being a "visitor" to the Boothbay region.

Tables 29 and 30 report the estimated daily expenditures of BRLT users who are visitors and seasonal residents, respectively. As shown in Table 29, visitors from outside the Boothbay region spend an average of $73.77 per day, with the largest amounts spent

on lodging ($34.84) and restaurant meals ($15.66). The lodging figure should not be interpreted to mean that overnight visitors to the Boothbay region spend an average of $34.84 per night on accommodations. Rather, the lodging figure means that all visitors—both overnight and day visitors—spent an average of $34.84; overnight visitors spent an average of $39.14 per day on lodging and day-use visitors did not spend any money on lodging. Based on an average party size of 2.98 people for those who reported overnight expenditures, we estimate that a group of overnight visitors spent an average of $116.80 per night on accommodations.

Table 30. Estimated Per Person Daily Expenditures of BRLT Users: Seasonal Residents

Expenditure Category	Estimated Daily Spending
Rent / mortgage payment	$13.58
Restaurant meals	$7.94
Food and beverages at stores	$14.24
Gasoline / transportation	$4.28
Retail purchases / souvenirs	$3.17
Entertainment / recreation	$2.78
Personal services	$1.84
Other	$10.10
total	$57.94

Notes. Spending figures are interpreted as the average amount of daily expenditures per BRLT preserve user who reports being a "seasonal resident" of the Boothbay region.

As shown in Table 30, seasonal residents spend an average of $57.94 per day while staying in the area, with the highest amounts spent on food and beverages at stores ($14.24) and rent / mortgage payment ($13.58). Seasonal residents include those who stay with friends and family members in the Boothbay region, people who live in homes that have been owned by the family for generations, and people who make rent or mortgage payments. The average party size of seasonal residents is 2.69 people, which

means that—for example—a group of seasonal residents spends an average of $38.31 on food and beverages (at stores) per day, or $268.14 per week.[6]

Table 31. Annual Economic Impact of BRLT Preserve Users: Visitors and Seasonal Residents

	Direct Impact	Multiplier Effects	Total Impact
Revenue	$2,983,689	$964,499	$3,948,188
Employment	29	10	39
Labor Income	$781,008	$325,408	$1,106,416

Notes. The direct revenue of $3.0 million is calculated as the product of the estimated daily spending of BRLT users who are visitors to the Boothbay region multiplied by the user count for visitors, plus the product of the estimated daily spending of BRLT users who are seasonal residents of the Boothbay region multiplied by the user count for seasonal residents. All other figures are estimated by the IMPLAN model for Lincoln County, Maine.

Table 31 presents information on the annual economic contribution of BRLT preserve users, with a focus on visitors and seasonal residents. The direct output of $3.0 million is calculated as product of the average daily expenditures of BRLT users who are visitors and seasonal residents multiplied by their respective use counts. This assumes that the visitors and seasonal residents are in the Boothbay region, at least for the days when the hiking trails are used, as a result of the BRLT preserves. The direct employment of 29 full- and part-time jobs is an estimate, from an input-output (IMPLAN, described below) model of the Lincoln County economy, of the number of positions that are supported by the direct spending of BRLT users who are visitors or seasonal residents.

[6] Information from the U.S. Department of Agriculture shows that the average weekly "cost of food at home," using a "liberal plan" for a family of four people, is between $245.60 and $286.40.

The direct labor income of $781,008 is the estimated amount of wages and salaries, from the IMPLAN model, earned by these workers.

The multiplier effects shown in Table 31 are the additional output (i.e., sales revenue), employment and labor income (e.g., wages and salaries) in Lincoln County that are supported by the purchases of businesses (i.e., suppliers) and workers that are related to the spending of BRLT users who are visitors or seasonal residents. The IMPLAN model, used to estimate the multiplier effects, is an input-output framework that traces the flows of expenditures and income through the Lincoln County economy with a complex system of accounts that are uniquely tailored to the region.[7] Underlying these accounts is information regarding transactions occurring among businesses located in the county, the spending patterns of households, and transactions occurring between these business and households and the rest of the world. Some of the data sources used to develop the IMPLAN model include County Business Patterns of the U.S. Census Bureau, Regional Economic Information System (REIS) data and input-output accounts from the U.S. Bureau of Economic Analysis, and ES-202 statistics from the U.S. Bureau of Labor Statistics.

Including multiplier effects, the spending of BRLT users who are visitors or seasonal residents has an annual economic impact of an estimated $3.9 million in output (i.e., revenue), 39 full- and part-time jobs, and $1.1 million in labor income (e.g., wages and salaries). The output multiplier of 1.32, defined as the ratio of total output ($3.9 million) to direct spending ($3.0 million), suggests that every $1.00 of spending by BRLT users who are visitors or seasonal residents supports a total of $1.32 in regional economic activity; that is, the “initial” $1.00 in spending (by the visitors and seasonal

[7] Version 3.0 of the IMPLAN model has information on 440 sectors of the economy.

residents) and an additional $0.32 in spending spread across other sectors of the economy. The employment multiplier of 1.34, calculated as the ratio of total (39 jobs) to direct (29 jobs) employment, implies that the economic activity associated with each person related to the direct spending of BRLT users who are visitors or seasonal residents supports a total of 1.34 jobs; that is, the person whose job is directly supported by the visitor and seasonal resident spending and an additional 0.34 full- and part-time jobs elsewhere in the region.

Table 32. Primary Reasons Why BRLT Users (Visitors) Come to the Boothbay Region (n = 102)

Reason	% of Respondents
Vacation destination	67.65%
Boating / visit the coast	31.37%
Visiting friends or relatives	26.47%
Outdoor recreation	23.53%
General sightseeing	19.61%
Restaurants and shopping	11.76%
Passing through on a trip elsewhere	3.92%
Business trip	0.98%
Other	11.88%

Note: Percentages sum to more than 100 percent because respondents were asked to select "all" reasons that apply.

When thinking about the economic impact results shown in Table 31, it is important to consider the extent to which the presence of BRLT preserves "attracted" visitors and seasonal residents to the region—as opposed to a situation in which the visitors and seasonal residents were already in the Boothbay region for other reasons. As shown in Table 32, the most frequently cited reason for why BRLT visitors come to the Boothbay region is that it is a "vacation destination" (68 percent), followed by "boating / visit the coast" (31 percent), "visiting friends or relatives" (26 percent) and "outdoor

recreation" (24 percent). The BRLT preserves—some of which are islands and others that provide views of (and access to) the coast—contribute to the experience of "boating / visit the coast" and "outdoor recreation," which are among the most cited reasons why the BRLT users (who are visitors) come to the Boothbay region. Furthermore, as noted in Table 28, BRLT users who are visitors to the region use the preserves an average of 2.34 times during their stay (which averages 6.19 nights for those who are overnight visitors).

Table 33. Primary Reasons Why BRLT Users (Seasonal Residents) Come to the Boothbay Region (n = 58)

Reason	% of Respondents
Long-time summer resident	78.95%
Rest and relaxation	40.35%
Boating / visit the coast	40.35%
Outdoor recreation	33.33%
Friends or relatives live in the area	19.30%
General sightseeing	17.54%
Restaurants and shopping	12.28%
Used to live in the area year-round	5.26%
Other	7.02%

Note: Percentages sum to more than 100 percent because respondents were asked to select "all" reasons that apply.

As shown in Table 33, the most cited reasons for why BRLT users (who are seasonal residents) come to the region is because they are "long-time seasonal residents" (79 percent), followed by "rest and relaxation" (40 percent), "boating / visit the coast" (40 percent) and "outdoor recreation" (33 percent). The BRLT preserves contribute, as noted above, to the experiences of "boating / visit the coast" and "outdoor recreation," which are cited by one-third or more of the BRLT users (who are seasonal residents) as to what draws them to the region. BRLT users who are seasonal residents report visiting the

preserves an average of 18.4 times during their stay (Table 28), which have an average duration of 12.5 weeks (87 days).

4. RESIDENT VALUATION OF BRLT PRESERVES

The final part of the study is a survey of Boothbay area residents to determine their willingness-to-pay for hiking trails and surrounding open space in the region. This information is used to estimate the value that residents place on the preserves maintained by BRLT. As shown in Table 34, surveys were sent to 1,550 property taxpayers in the Boothbay region, covering year-round and seasonal residents (i.e., those with mailing addresses outside the area).[8] After accounting for surveys that were undeliverable, the 728 returned surveys yielded a response rate of 50.3 percent. Of these 728 surveys, 650 were received before the data entry "cutoff" date of December 20, and 78 questionnaires were received after this date. The main analysis (i.e., Tables 35 and 36) is based on the surveys received prior to December 20, but the information gained from analyzing the surveys received after this date is important for estimating the results of those who did not complete the survey. This is done because the "last" respondents to return the questionnaires are believed to be more similar to non-respondents than those who completed the surveys immediately upon receiving them.

Along with a "contingent valuation" question that asks about the respondent's willingness to "make a donation" to help protect hiking trails and surrounding open space, the survey also collected information concerning resident attitudes about open space and land use in the region. As shown in Table 35, about 86 percent of the survey respondents—included in the group of 650 returned surveys—either "strongly agree" or "agree" with the statement that "protecting open space is good for the Boothbay region." The positive sentiments about open space are echoed in the high levels of agreement—

[8] Two rounds of surveys were conducted. An initial survey was sent to the entire sample of 1,550 property taxpayers in early November, and replacement surveys were sent to non-respondents in late November / early December.

either "strongly agree" or "agree"—with the statements that "open space provides a good place for outdoor recreation" (94 percent), "open space is important for animal habitats" (94 percent), "it is important to protect open space for the enjoyment of future generations" (91 percent), "open space helps the Boothbay region attract tourists" (82 percent) and "open space increases property values of nearby homes" (77 percent).

Table 34. Boothbay Resident Survey Distribution and Response Rate

	Count
Surveys mailed	1,550
Undeliverable	103
Surveys received before data entry cutoff date	650
Surveys received after data entry cutoff date	78
Total	728
Response rate	50.3 percent

Survey respondents, however, have more mixed feelings about the "costs" of open space in terms of affecting local taxes and employment opportunities. More than 40 percent of those who returned surveys "strongly agree" or "agree" with the statement that "protecting open space means businesses and households pay higher taxes," compared to about 30 percent who "strongly disagree" or "disagree" with this statement. Only 16 percent indicate some level of agreement with the statement that "open space takes away land that could be developed to provide local jobs," while over 60 percent "strongly disagree" or "disagree" with it. The survey respondents are almost evenly split on the statement that "too much of the land in the Boothbay region is developed."

Table 35. Boothbay Region Resident Attitudes about Open Space and Land Use

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Too much of the land in the Boothbay region is developed	7.89%	21.14%	41.78%	23.66%	5.54%
Open space helps the Boothbay region attract tourists	39.61%	42.83%	9.98%	6.60%	0.97%
Access to the waterfront is important to me	68.09%	25.12%	5.69%	0.79%	0.32%
Protecting open space means businesses and households pay higher taxes	8.39%	30.54%	29.53%	23.66%	7.89%
It is important to protect open space for the enjoyment of future generations	52.04%	39.15%	6.13%	1.42%	1.26%
Open space is important for animal habitats	59.24%	34.76%	4.74%	0.47%	0.79%
Open space takes away land that could be developed to provide local jobs	4.38%	12.01%	23.05%	42.05%	18.51%
Open space increases property values of nearby homes	23.14%	53.56%	16.50%	5.50%	1.29%
Open space provides a good place for outdoor recreation	46.21%	48.26%	4.10%	1.10%	0.32%
I don't mind paying higher taxes if I have access to open space	14.87%	30.22%	28.32%	17.56%	9.02%
Protecting open space is good for the Boothbay region	44.06%	42.31%	11.09%	1.43%	1.11%

Note. Percentages reported in the table are based on the 650 surveys received before December 20, but do not include (a very low number of) respondents who indicated "don't know" or those who did not answer the question. Sample size varies slightly by statement.

About 35 percent of the survey respondents "strongly agree" or "agree" with the statement that "I don't mind paying higher taxes if I have access to open space," which is lower than the percentage of respondents who would make a voluntary donation in

support of hiking trails on open space. As shown in Table 36, almost 50 percent of the survey respondents would make a donation—ranging from $25 to $1,000—to provide hiking trails in the Boothbay region. Using information on the percentages of respondents who would make a donation of varying amounts, we estimate an average willingness-to-pay for hiking trails and surrounding open space of $278.94 in the Boothbay region. This translates into an average willingness-to-pay—for the sample of respondents who returned surveys by December 20—of $88.55 per mile of trail.

Table 36. Resident Willingness-to-Pay for Hiking Trails (and Surrounding Open Space) in the Boothbay Region (n=616)

Amount of Donation	Percentage who Would Donate
$25.00	68.28%
$50.00	65.74%
$100.00	62.65%
$250.00	44.94%
$500.00	28.57%
$1,000.00	15.05%
All amounts	49.35%
Average Willingness-to-Pay	$278.94
Average Trail Length for Donation	3.15 miles
WTP Per Mile	$88.55

As noted previously in the report, BRLT users who are permanent residents of the Boothbay region are not counted in the economic impact analysis because it is unlikely that the presence of the preserves helps generate significant (additional) retail- or

hospitality-related spending of locals. These residents and those who reside in the Boothbay region seasonally (who are counted in the economic impact analysis), however, can benefit from the hiking trails and preserves maintained by BRLT. The attitudes about land use in the Boothbay region (see Table 35) suggest that residents value open space for a variety of reasons—e.g., outdoor recreation, attract tourists, provide animal habitat, increase property values.

Although it is possible that non-respondents have a willingness-to-pay that is similar to those who completed the survey, it is likely that they place a lower value on the trails and surrounding open space. As mentioned above, information received from the "last" surveys returned—in addition to the 650 analyzed above—is used to estimate the value that non-respondents place on hiking trails in the Boothbay region. Based on 78 additional surveys, an average willingness-to-pay of $254.25—compared to the $278.94 in Table 36—suggests that the "last" respondents to return their surveys and, thus, the non-respondents place an estimated value on hiking trails that is about ten percent lower than the value inferred from the "first group" of respondents.

Using information from all of the received surveys, we estimate that the year-round and seasonal residents of the Boothbay region place an estimated $1,074,029 value per mile on the presence of the trails and surrounding open space maintained by BRLT. This is calculated as the product of the willingness-to-pay per mile—adjusted to account for a lower estimated willingness-to-pay for "non-respondents"—multiplied by the number of year-round and seasonal residents of the Boothbay region.[9] Applying this amount per mile to the entire land trust would imply a resident valuation of an estimated

[9] For this calculation, the region is defined as the towns of Boothbay, Boothbay Harbor, Edgecomb and Southport. Information from the 2010 U.S. Census was used to estimate the number of year-round and seasonal residents.

$32.2 million. When interpreting these figures, it is important to note that, for some people, the willingness-to-pay for trails and surrounding open space could be influenced by the amount that is already preserved. If no trails were available in the Boothbay region, the willingness-to-pay for the "first" mile would likely be higher than the amount estimated in the study. This means that the overall value of $32.2 million is likely a conservative estimate because the "first few miles" (counted in the entire BRLT trail network of 30 miles) would be valued at a higher amount.[10]

[10] The exact amount by which the per-mile estimated value of the BRLT trails would understate the "first few miles" is unknown, but it is worth reiterating that the survey respondents are mixed on whether or not too much land in the Boothbay region is developed. If residents overwhelmingly believed that "too little" land was developed, it would suggest that additional preserved land would have lower value than what is already protected. If, on the other hand, survey respondents more uniformly believed that "too much" land was developed, it would imply that additional preserved land would be valued at a level more similar to the existing parcels.

5. SUMMARY

The purpose of this study was to examine the economic impact and resident valuation of the hiking trails and surrounding open space maintained by the Boothbay Region Land Trust (BRLT). Based on 500 hours of fieldwork conducted on BRLT preserves, we estimate an overall count of 63,832 preserve uses between April and November of 2012. This translates into 13,081 unique users—251 are year-round residents, 864 are seasonal residents and 11,966 are visitors to the Boothbay region.

A survey of BRLT users suggests that those who are visitors to the area spend an average of $73.77 per day in the region, and seasonal residents who use the BRLT preserves have an average of $57.94 in daily expenditures. The annual economic impact, including multiplier effects, of the expenditures made by BRLT users who are visitors or seasonal residents is an estimated $3.9 million in revenue, 39 full- and part-time jobs, and $1.1 million in labor income. This assumes that the visitors and seasonal residents are in the Boothbay region, at least for the days when the hiking trails are used, as a result of the BRLT preserves.

A survey of year-round and seasonal residents found that people generally believe that open space is beneficial to the Boothbay region. Based on the survey results, we estimate that residents have a willingness-to-pay of $1.1 million for a mile of hiking trails in the Boothbay region, which translates into an overall value of $32.2 million for the 30 miles maintained by BRLT. This may be a conservative estimate of the land trust's value to local residents, because it is based on the amount of land that is currently protected and the value of the existing trails would be higher—other things being equal—than the willingness-to-pay for additional trails and surrounding open space.

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