

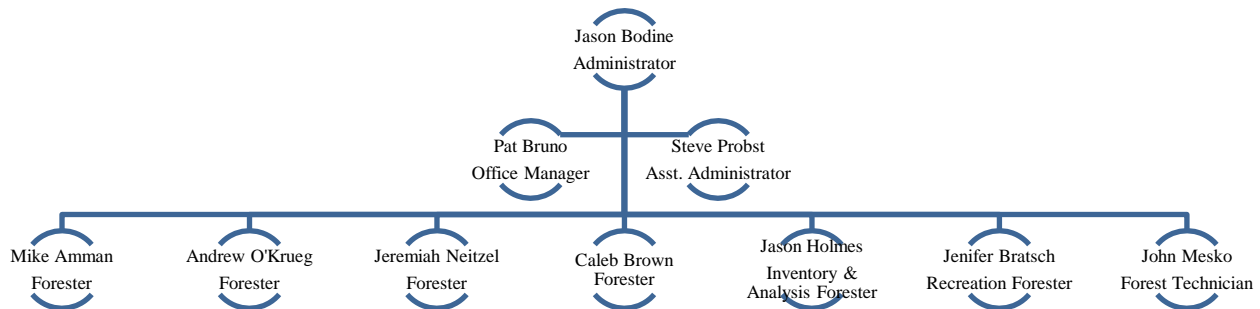
# BAYFIELD COUNTY FORESTRY AND PARKS DEPARTMENT ANNUAL ACCOMPLISHMENT REPORT FOR THE CALENDAR YEAR 2018

## FORESTRY AND PARKS COMMITTEE

Fred Strand, Chair  
Jeff Silbert, Vice-Chair  
Harold Maki

Larry Fickbohm  
David Zepczyk

## DEPARTMENT STAFF



## LAND AREA

Below is the current amount of county forest acreage located within each Township:

Barnes	40,540.36	Cable	5,556.33	Oriente	4,720.00
Bayfield	32,912.56	Clover	5,386.57	Port Wing	8,876.18
Bayview	13,151.47	Hughes	24,673.01	Russell	8,490.82
Bell	14,585.03	Iron River	6,042.22	Tripp	6,539.52
Namakagon	546.80				

Official County Forest Acreage: 172,020.87

There are approximately 3,500 acres of county tax title lands, not including lots and small parcels, in addition to the above listed county forests lands. On occasion, the Forestry and Parks Department (hereafter “Department”) will monitor these parcels for land and/or timber sales, potential trespass issues, and negotiate road/utility easements, as well as sand and gravel permits.

## COMPREHENSIVE LAND USE PLAN

A comprehensive land use plan that will guide the management of the county forest for the next 15 years was developed in 2005 and approved by the county board in January 2006. This plan will be

periodically reviewed and amended, as necessary. Amendments must be approved by the County Board of Supervisors.

There were no Land Use Plan amendments in 2018. However, the Forestry and Parks Committee and County Board of Supervisors approved the Department's 2018 work plan. The annual work plan gives direction and meaning to the Forestry and Parks Department budget, further defines and supplements the Comprehensive Fifteen Year Land Use Plan, and emphasizes current goals and needs of the County Forest, Parks and Trails Programs.

Previous amendments include: revisions to Chapter 700 (Access Management) were approved by the county board in 2013. Revisions to the county forest blocking boundary map were approved by the county board in 2014 (the map is located in Chapter 900 of the Land Use Plan).

## **FOREST MANAGEMENT**

The forest management program is one of the most significant responsibilities of the Department and one of the largest (and in many years, the largest) of any county forest program in the state.

There are three major facets of the program: 1) forest management (primarily timber sale establishment and administration), 2) reforestation (natural and artificial), and 3) forest monitoring (stand and/or compartment updates). The quality and quantity of goal accomplishments, as well as the sold value of timber sales, are some of the best indicators used to evaluate performance.

For more detailed information on current goals, policies, procedures and general direction regarding the management of the county forest, please refer to the Fifteen Year Land Use Plan, the 2019 Budget Narrative and 2019 Department Annual Work Plan. All documents can be found online at: <http://www.bayfieldcounty.org/243/Plans>.

Below are accomplishment summaries of the major forest management goals, priorities and objectives:

- 1) **Sustainable Timber Harvest Goals:** sustainable timber harvest goals for every major forest type are calculated based upon sound silvicultural guidelines and principles.

Existing stand information, silvicultural prescriptions, responses to previous management/treatments, reactions to insect and disease outbreaks or other natural disasters, short or long-term adjustments due to predicted or unexpected management challenges, and more, are all part of the goal development process.

Timber management accomplishments can be, and oftentimes are, influenced by the factors listed above. Sustainable harvest goals (acres) are measurable targets, though fairly dynamic in nature and, as such, are also influenced by a variety of other variables, including, but not limited to: existing stand conditions, current management direction, minor nuances/logistics associated with the timber sale establishment process (i.e. boundary line location, the presence of riparian zones or inoperable slopes, size and/or location of the targeted stand, surrounding management history, etc.), long term projections and/or objectives, and staffing assignments/priorities.

Table 1 displays the sustainable harvest goals and accomplishments of the timber sale program by major forest type since 2014.

**Table 1: Bayfield County Forest Sustainable Harvest Goals and Accomplishments (acres)**

Species	2014		2015		2016		2017		2018		Average	
	Goal	Accomp.	Goal	Accomp.	Goal	Accomp.	Goal	Accomp.	Goal	Accomp.	Goal	Accomp.
Aspen	1,265	1,314	1,300	1,292	1,340	1,340	1,375	1,416	1,420	1,394	1,215	1,242
Nor. Hdwd	900	857	835	804	895	870	890	809	720	586	927	859
Red Oak	700	981	820	823	870	872	900	772	795	636	791	750
Paper Birch	90	131	40	53	30	0	30	55	25	11	85	66
Scrub Oak	205	275	250	247	255	288	215	227	255	291	189	231
Red Pine	880	811	855	1,041	935	906	915	912	930	850	917	902
Jack Pine	190	182	165	194	365	498	345	386	192	238	344	363
White Pine	120	127	100	97	90	87	90	47	80	173	89	94
Fir/Spruce	40	36	40	44	40	44	30	1	25	82	63	75
Swamp Conifer <sup>1</sup>	120	54	130	98	140	40	140	45	100	70	116	83
Swamp Hdwd. <sup>1</sup>	110	74	110	88	100	41	100	94	120	41	93	52
Total	4,620	4,842	4,645	4,781	5,060	4,986	5,030	4,764	4,662	4,372	4,829	4,716

<sup>1</sup> Timber types included in goals starting in 2011

### **Accomplishment Summary**

As part of the timber sale program, a total of 4,372 acres of county forest was sustainably managed in 2018. This represents a decrease of about 8% when compared to the total for 2017, but an increase of roughly 30% when compared to the average accomplishments prior to 2012. The significant increase in accomplishment is a direct result of adding a new forester position in 2011.

Total sustainable harvest accomplishments were nearly 94% of the overall goal for 2018. The goal for most major timber types fell within the target range. Below is a summary of accomplishments for the major timber types.

- **Aspen:** the accomplishment rate for the aspen type was 98% of the management goal (under by 26 acres). Minor nuances associated with timber sale design and development are the primary reasons for the difference.
- **Northern Hardwoods:** 81% of the management goal (under by 134 acres). A major northern hardwood/swamp hardwood timber sale, roughly 190 acres in size and located in IRMU 6 (south Barnes), was still in process of development through the winter of 2018/2019. As a result, the management acres associated with that sale will be included in, or amended to, the 2019 sustainable harvest goal for northern hardwoods. The reporting of that sale is the primary reason for the difference.
- **Red Oak:** 80% of the management goal (under by 159 acres). The red oak goal is separated into three distinct management/harvest groups: 1) regeneration harvest; 2) thinning; and 3) overstory removals. Overstory removals are only established when stands have achieved an acceptable level of desirable regeneration. During the timber sale development process, stands that were prescribed an overstory removal are analyzed for readiness, with a focus on regeneration. The overstory removal goal

for 2018 was set at 240 acres. However, it was determined that many stands were not ready for treatment. As a result, 146 acres of overstory removals were established (or 94 acres under goal). The remaining difference can be accounted for through minor nuances in timber sale design and one additional stand not being ready for management.

- Scrub Oak: 114% of the management goal (over by 36 acres). Scrub oak quality is highly variable, is, on average, over mature, and is, in general, exhibiting significant signs of mortality and decline. During the timber sale establishment process, areas exhibiting greater signs of mortality and decline are often included in adjacent sales (where smaller stands are added to other sales being established in the vicinity). Capturing mortality and starting the regeneration process in these over mature stands is the primary reason for the difference.
- Red Pine: 91% of the management goal (under by 80 acres). A sustainable harvest goal is developed for each timber type per IRMU. In general, the total acreage for each goal is comprised of numerous stands of varying size (acres). In some cases, after addressing a few larger stands, most of the goal in a unit has been some managed. However, oftentimes, a small amount of harvest goal (acreage) will still remain within a unit. These smaller stands are either added to adjacent sales (if any are being established nearby) or left to join with adjacent stands for future management. Most of the remaining harvest goal was comprised of smaller stands left for future management.
- Jack Pine: 124% of the management goal (over by 46 acres). The management goal for jack pine is primarily separated into two distinct areas: 1) stands located within the Barnes Barrens Management Area; and 2) stands located outside the Barrens. Most of the older jack pine stands located within the Barrens areas are over mature (or well past the average rotation age). As per the annual work plan, adjustments to the goal for jack pine may be needed to address rapid stand mortality or to advance the development of the Barnes Barrens Management Area. The difference in accomplishments for jack pine are primarily associated with capturing mortality on stands exhibiting significant signs of decline and achieving desired objectives within the core area of the Barrens.
- White Pine: 216% of the management goal (over by 93 acres). Roughly 10% of the total harvest accomplishment goal in any given year is from stands that were updated (rather than established as a timber sale). The reasons to update a stand rather than set it up as a timber sale are addressed below (see Tables 2 and 3). In 2018, a few larger stands of white pine (114 acres total), that were on the schedule for management, were updated rather than established as a timber sale. These stands either were not ready for management or were retained as reserve islands for landscape level structural diversity (they were located in areas that were previously harvested). Updating these stands was the primary reason for the overage.
- Swamp Conifer: 70% of the management goal (under by 30 acres). The swamp groups are generally the more difficult timber types to manage. Stand densities and merchantable size classes are often highly variable and accessibility can be a significant challenge. Swamp types are also generally very irregular in shape and small in size (acreage). Many of these factors aren't realized until a detailed examination of the stand. All of the factors listed above influenced the accomplishment rate for the swamp conifer type.

- **Swamp Hardwoods:** 34% of management goal (under by 79 acres). In 2018, an emphasis was placed on obtaining up to date information on mature stands of swamp hardwoods. The information will be used to develop prioritize the management of this type. Starting in CY 2019, an emphasis will be placed on the acceleration of swamp hardwood management, in anticipation of eventual infestation from the emerald ash borer.

Traditionally, the swamp types were not part of the annual harvest goal (added in 2011), primarily due to the nature of the stands (i.e. low productivity, wet soils, poor markets, etc.). Over a relatively short period of time, once the mature and suitable stands have been managed, it is expected that the goal for both swamp types (conifer and hardwoods) will decrease significantly. Swamp types are primarily included on the harvest schedule as an attempt to identify priority stands and treat those that need, or are suitable for, management.

In general, the sustainable harvest accomplishments are in the form of a timber sale. However, there are occasions when a stand is updated and managed at a later date (or removed from the management schedule altogether). Updates typically occur when a stand has not attained the predicted amount of growth in between harvests, when a stand simply isn't ready for management, when the data describing the stand is incorrect, when a stand is retained for another purpose (i.e. green tree retention, reserve islands, landscape and/or structural diversity, etc.), or when the stand is removed from management due to a restrictive feature (i.e. riparian/wetland buffers or inoperable slopes).

Table 2 displays a summary of the accomplishments for the sustainable timber harvest program, from 2010 through 2018.

**Table 2: Bayfield County Forest Sustainable Harvest Summary (acres)**

<b>Year</b>	<b>Management Goal</b>	<b>Timber Sale Establishment</b>	<b>Stand Update<sup>a</sup></b>	<b>Total Accomplishments</b>
2010	4,285	3,331	326	3,657
2011	5,108	4,491	499	4,990
2012	5,234	4,588	595	5,183
2013	4,815	4,348	517	4,865
2014	4,620	4,331	511	4,842
2015	4,645	4,289	492	4,781
2016 <sup>b</sup>	5,060	4,718	304	5,022
2017 <sup>c</sup>	5,030	4,354	465	4,819
2018 <sup>d</sup>	4,662	3,775	607	4,382
Average	4,829	4,247	480	4,727

<sup>a</sup> Stands are updated, in part, due to inaccuracies in the data or insufficient growth for management.

<sup>b</sup> Includes 89 acres of blowdown salvage sales and 36 acres of other forest types, not inc. on harvest goals table.

<sup>c</sup> includes 55 acres of other forest types not inc on harvest goals table.

<sup>d</sup> includes 10 acres of other forest types not inc on harvest goals table.

On average, roughly 10% of the annual sustainable harvest goal is either not ready for management, is incorrectly typed or is removed from the harvest schedule, as described

above. However, one primary objective of the reconnaissance/monitoring program is to provide accurate, up to date information across all timber types, thus reducing incidents where stand data is incorrect.

In 2018, roughly 86% of the total accomplishment goal (acres) was in the form of a timber sale (approximately 14% not established as a timber sale for the reasons described above). This is above the average for stand updates from over the past nine years (which is a little over 10%). The 607 acres also represents the most amount of stand updates in the past nine years.

Table 3 displays a summary of the primary reasons for stand updates in CY 2018

**Table 3: 2018 Stand Update Summary**

Reason For Update	Acres
Incorrect Data	337
Prescription Change	114
Riparian Management Zone (buffer)	80
Retention	45
Stand Not Ready	31
Total	607

Updating stand information, on a routine and regular basis, should significantly reduce the number of stands being removed from harvest consideration due to incorrect data. When most of the stand information has been updated, the expectation is that a higher percentage of stands will be actively managed in the future.

- 2) **Timber Sale Program:** Table 4 displays the summary of timber sale offerings since 2008, including the total number of sales sold per year, total acres, the total value of the winning high bids, the average bid value per acre and total revenues received from the sale of timber during each calendar year.

**Table 4: Bayfield County Forest Timber Sale Summary**

Calendar Year	Sales Offered	Acres Offered	Sales Sold	Acres Sold	Acres Not Sold	Timber Sale Bid Values	Bid Value per Acre	Timber Revenues
2008	58	3,546	55	3,507	39	\$2,381,513	\$679	\$2,621,308
2009	45	3,297	42	3,100	197	\$2,510,601	\$810	\$2,305,259
2010	40	3,218	40	3,218	0	\$2,404,178	\$747	\$2,047,663
2011	54	4,156	54	4,156	0	\$3,629,330	\$873	\$2,477,066
2012	53	4,782	53	4,782	0	\$4,900,194	\$1,025	\$2,696,756
2013	54	4,275	53	4,177	98	\$3,614,091	\$865	\$3,904,104
2014	61	4,388	61	4,388	0	\$5,252,530	\$1,197	\$4,537,661
2015 <sup>a</sup>	57	5,215	54	4,958	257	\$6,507,887	\$1,313	\$5,006,565
2016 <sup>bc</sup>	65	4,750	65	4,750	0	\$4,745,850	\$999	\$5,057,393
2017	53	4,272	50	4,101	171	\$3,719,320	\$907	\$5,009,892
2018	56	4,568	49	3,813	755	\$3,509,971	\$921	\$4,562,243
Average	54	4,224	52	4,086	138	\$3,925,042	\$940	\$3,656,901

<sup>a</sup> Timber revenues include \$13,506.80 generated from the management of non county forest lands.

<sup>b</sup> Includes 89 acres of blowdown salvage sales.

<sup>c</sup> Timber revenues include \$15,393.90 generated from the management of non county forest lands.

Bayfield County offers two timber sale lettings per year, one in the spring and one in the fall.

From 2015 through 2017, revenues received from the sale of wood were at an all-time high. Over \$5.0 million in timber sale revenue was received each year (an average of \$5.025 million per year). However, in 2018, timber revenues decreased by roughly 9% when compared to the amount received in 2017. The decrease in revenue was anticipated, as stumpage prices have receded significantly over the past few years, leading to more volatile and unpredictable market conditions.

The decrease in stumpage prices and more volatile market conditions are best reflected in the total timber sale bid values and acres not sold, as summarized in Table 4. Total sold bid values have decreased significantly, from a high of \$6.5 million in 2015 to a little over \$3.5 million in 2018 (which is the lowest total amount since 2010). In addition, a total of 755 acres worth of timber sales did not sell in 2018.

This is the most amount of unsold sales in over a decade. All of the unsold sales were located in areas that required frozen ground conditions for most (or all) of the harvest operations. Market demand for frozen ground only sales was also very poor in 2018, thus contributing to the lack of interest.

The \$4.562 million received in 2018 was the lowest amount of timber sale revenue since 2014. However, the past three seasons were part of an unprecedented stretch of record breaking timber sale revenues. A combination of strong market demand and higher average stumpage prices, timed with a strategic increase in sustainable harvest goals (which started in 2011), were the driving forces behind the banner revenue. Still, the amount of revenue received in 2018 was nearly two times greater than the average amount received prior to 2012 (which was approximately \$2.3 million).

The amount (number) and acreage of sales sold was down in 2018, with a total of 49 sales sold, covering a total of 3,813 acres, with a total bid value of \$3,509,971 (\$921/acre sold). The total acreage sold was a decrease of 7% when compared to 2017, a decrease of 23% when compared to the amount sold in 2015, and the lowest amount of new sales sold since 2010.

Many of the reasons for the decrease in sales sold have been addressed above, but are primarily attributed to: the overall sustainable harvest goal (a decrease of about 370 acres when compared to the 2017 goal); the total number of acres that were updated as part of the overall 2018 accomplishment (607); poor market conditions; and frozen ground only harvest restrictions (on the unsold sales).

Since 2011 (when modifications to the forest management program went into full effect), the Department has averaged roughly 57 sales, covering approximately 4,500 acres, with sold timber sale bid values of nearly \$4.50 million (or about \$1,021/acre) and stumpage revenues in excess of \$4.15 million.

The timber sale bidding dynamics in 2018 were also markedly different when compared to previous offerings.

Table 5 summarizes the timber sale bidding dynamics since 2009.

**Table 5: Timber Sale Bid Summary**

Year	No. of Sales Offered	Acres Offered	No. of Sales Sold	Acres Sold	Total No. of Bids	Avg No. of Bids Per Sales Sold	No. of Different Bidders
2009	45	3,297	42	3,100	218	5.2	32
2010	40	3,218	40	3,218	169	4.2	33
2011	54	4,156	54	4,156	261	4.8	43
2012	53	4,782	53	4,782	282	5.3	35
2013	54	4,275	53	4,177	221	4.2	34
2014	61	4,388	61	4,388	357	5.9	37
2015	57	5,215	54	4,958	251	4.6	39
2016	65	4,750	65	4,750	323	5.0	39
2017	53	4,272	50	4,101	296	5.9	41
2018	56	4,568	49	3,813	190	3.9	27
Average	54	4,292	52	4,144	257	4.9	36

Referring to Table 5, the total number of bids was at the lowest level since 2010, but the average number of bids per sale sold and the number of different (or unique) contractors bidding on at least one sale were at the lowest levels in over the past decade. As markets improve, the expectation is that acres sold, total number of bids and number of different bidders will also increase. A healthy diversity of contractors is one of the keys to optimizing potential timber sale revenues.

In general, the long term sustainable timber harvest goals are projected to remain stable at around 4,500 to 5,000 acres per year (the harvest goal for 2019 is 4,912 acres). As previously stated, numerous variables can impact how many acres are actually established in any given year.

Markets are still poor and predicted to remain so into the foreseeable future. Fluctuations in stumpage prices and volatile market conditions will have an impact on timber sale revenues. Revenues for 2019 (and into the future) are directly associated with the value of sales currently under contract, as well as the value of new sales sold in the future. If current trends persist, future timber sale revenues could hover around \$3.5 million to \$4.25 million per year, which is a significant decrease from the average received over the past five years (\$4.835 million).

### **Timber Sale Contracts**

In 2018, the Department awarded 49 new timber sale contracts, covering 3,813 acres, with a total bid value of \$3,509,971 (\$921/acre). Total timber sales awarded in 2018 decreased by 2% when compared to the previous year. Total acreage awarded decreased by about 7% and the total winning bid values decreased by roughly 6% over the same time period.

When compared to 2015 (which was a record year for acres sold, total bid values and bid value per acre), the winning bid value decreased by roughly 85%. The bid value per acre



decreased by nearly 43% over the same time period. As stated above, this decrease is significant, as it has the potential to directly influence future revenues (see below).

Annual stumpage revenues are generated, almost exclusively, from previously awarded timber sale contracts. Revenues generated from forest products harvested on every timber sale are based solely upon the bid price per product per species as listed in each contract. In general, all timber sale contracts are awarded on a two-year basis, meaning a contractor has two years to complete the harvest.

However, the Department will also routinely grant contract extensions. Each contract extension adds one year to the length of the contract. It's not uncommon for a contractor to be granted one or two extensions. In some instances, three and up to four, one-year extensions have been granted. On rare occasions, where warranted, a fifth extension may be granted.

In summary, it can take up to four years or longer before a timber sale contract has been completed. Markets play a major role on when timber sales go active, but, on average, roughly 75% of all sales are completed within the initial two-year contract period.

Revenue from a significant percentage of sales sold in 2018, as well as some to be sold in the upcoming year, will be received in 2019 (see the section on Timber Sale Revenue Model for more information on the timing of stumpage revenue). If markets continue to trend downward, the county may experience a significant decrease in future timber sale returns.

### **Timber Sale Activity**

Table 6 below summarizes timber sale activity on the forest since 2009.

**Table 6: Summary of Annual Timber Sale Activity<sup>1</sup>**

<b>Year</b>	<b>Offered</b>	<b>Sold</b>	<b>Active<sup>2</sup></b>	<b>Completed<sup>3,4</sup></b>
2009	45	42	63	75
2010	40	40	66	70
2011	54	54	66	52
2012	53	53	64	41
2013	54	53	89	43
2014	61	61	97	64
2015	57	54	89	62
2016	65	65	93	41
2017	53	50	94	58
2018	56	49	80	56
<b>Average</b>	<b>54</b>	<b>52</b>	<b>80</b>	<b>56</b>

<sup>1</sup> Total number per activity per year.

<sup>2</sup> Includes active harvesting, hauling, scaling, payments, close-out activities, etc.

<sup>3</sup> Once all contract obligations have been met, a timber sale is officially closed.

<sup>4</sup> in late 2009/early 2010, a large backlog of completed sales were all closed-out at once.

Timber sale activity occurs in a variety of forms, including, but not limited to: pre-sale meetings, timber harvesting, forwarding, scaling, hauling, road building, contract

extensions, accounts management, contract close-out requirements, and more. When any action occurs on a given contract, it's classified as active.

A total of 80 timber sales went active in 2018. Since 2012, an average of roughly 87 timber sales are active during the year. This is a stark contrast to pre-2012 activity levels, which averaged about 52 per year (an increase of nearly 70%). Timber sale activity can last anywhere from a period of a few days or weeks, to a few months, to most of a year, depending on the size of the sale, harvesting restrictions, operating conditions and the general goals of the contractor.

As of the end of CY 2018, the Department had 121 timber sales under contract, with 34 different contractors and a total contract value of over \$10.2 million. During any point in the year, anywhere from around 10 to upwards of 20, or more, timber sales can be active at one time.

### **Timber Sale Revenue Model**

When analyzing timber sale revenues and the results from previous timber sale offerings, general patterns develop that allow the Department to estimate when to expect proceeds from existing contracts. In general, roughly 45% of the revenue generated during any calendar year comes from contracts sold during the previous year. Approximately 20% is derived from those sold during the current year, 20% from two years prior, 10% from three years prior and the rest beyond that. The percentages can vary slightly from year to year, but generally follow this same pattern.

For example, based on the above model, the general expectation is the 20% of the revenue generated in 2019 will come from sales sold in 2019; 45% from sales sold in 2018; 20% from sales sold in 2017; 10% from sales sold in 2016 and the rest from 2015 and 2014.

Referring back to Table 4, the banner stumpage revenue received by the Department in calendar years 2015 and 2016 were a result of very strong markets from the year's prior (timber sale bid values were at an all-time high in 2015). CY 2016 was a poor market comparatively, as were 2017 and 2018.

Markets for 2019 aren't expected to increase dramatically, if at all. Assuming a poor or below average market in 2019, the general prediction is for a significant decrease in sale of wood revenues (in 2019), by as much as 10 to 20%.

### **Harvested Volume**

Table 7 below displays the total volume of timber harvested from Bayfield County Forest timber sales from 2013 through 2018. Pulp (cords) and logs (Mbf – thousand board feet) are displayed for each primary timber type. For the sake of comparison, all tonnage sales (chips) were converted to cords (approximately 15% of all timber sales are sold by the ton).

Table 7 also displays the total amount of timber sale revenue received each year, as well as cord equivalents (which converts logs into cords in order to provide a general overview/summary of the entire program).

**Table 7: Timber Harvest Volume Summary (pulp in cords and logs in thousand board feet)**

Species	2012		2013		2014		2015		2016		2017		2018		Average	
	Pulp	Logs	Pulp	Logs	Pulp	Logs	Pulp	Logs	Pulp	Logs	Pulp	Logs	Pulp	Logs	Pulp	Logs
Aspen	14,647	1	20,288	0	26,154	0	23,486	0	19,295	0	26,749	0	29,704	0	21,104	0
Mx. Hardwood <sup>1</sup>	13,316	129	17,960	377	25,238	506	23,705	561	26,513	655	19,355	568	20,474	482	20,454	417
Oak	7,916	1,127	10,796	1,293	18,162	2,439	14,004	2,103	14,262	2,814	14,087	2,027	14,101	2,274	12,719	1,787
Paper Birch	1,083	22	1,169	17	562	9	383	6	702	25	320	11	718	33	715	20
Basswood	1,022	62	1,801	252	1,538	130	2,012	372	2,087	302	1,252	232	720	111	1,452	190
Red Pine	10,694	0	14,637	0	13,266	0	10,637	0	11,921	0	9,720	0	9,376	0	10,409	2
Jack Pine	5,352	0	11,211	0	5,715	0	5,633	0	5,342	0	9,095	0	5,334	0	6,532	0
White Pine	48	0	2,083	0	460	0	630	0	848	0	1,558	0	465	0	764	0
Other Conifer <sup>2</sup>	465	0	1,079	0	2,227	0	2,533	0	1,402	0	3,078	0	6,369	0	2,014	0
Total	54,543	1,341	81,024	1,939	93,321	3,084	83,023	3,042	82,372	3,796	85,214	2,838	87,261	2,900	76,163	2,416
Total Cord Equiv. <sup>3</sup>	57,493		85,291		100,107		89,715		90,723		91,458		93,641		81,478	
Revenue	\$2,696,756		\$3,904,104		\$4,537,661		\$5,006,565		\$5,057,393		\$5,009,892		\$4,562,243		\$3,922,149	

<sup>1</sup> Sugar Maple, Red Maple, Yellow Birch, Black Ash, White Ash.

<sup>2</sup> White Spruce, Black Spruce, Balsam Fir, Tamarack, Mixed Conifer.

<sup>3</sup> Log volumes converted to cords and added to the pulp volume.

In summary, 2018 was another exceptional year for timber harvested from the county forest. A little over 87,000 cords and 2,900 MBF of logs were harvested. Total cords and logs harvested were both up by about 2% when compared to 2017.

Table 7 also includes a summary of cord equivalents. This converts the log volume to cords as an attempt to simplify/quantify the total amount of wood harvested annually. Total cord equivalents in 2018 were 93,641, which was about 2% more than 2017 and the second highest total on record (second only to CY 2014, when over 100,000 cord equivalents was harvested). The average cord equivalents since 2013 is roughly 91,800 cords per year. Prior to 2013, the average was about 61,000 cords, an increase of about 50%.

The amount of aspen volume harvested annually from the forest was at an all-time high in 2018, at nearly 30,000 cords. In general, the increase in harvested aspen volume is directly related to the steady, but gradual increase in the sustainable harvest goal for aspen. As the harvest goal for aspen normalizes (which should occur within the next few years), so to will the harvested volume.

The mixed hardwood cordwood volume harvested in 2018 increase by about 6% when compared to 2017, but is generally on par with the average removals over the past six years. However, mixed hardwood log volume decreased by about 15% over the same time period.

The total volume of red oak harvested in 2018 was very similar to 2017. A total of 14 more cords was harvested in 2018 when compared to 2017. However, the red oak log volume increased by 12% over the same time period. Red oak is the dominant species when analyzing total log volume harvested during any period of time. A total of 2,274 Mbf of red oak logs were harvested in 2018, which accounts for over 78% of the total log volume removed during that period.

Red pine volume has slowly decreased virtually every year since 2013. In 2018, a total of 9,376 cords was harvested. This was a decrease of 4% when compared to 2017; a decrease of roughly 21% when compared to 2016; and a decrease of 36% when compared to 2013 (which was also a banner year for total volume of red pine harvested). As previously stated, markets have generally receded over the past few years, and softwood markets have been one of the most volatile. Sustainable harvest goals for red pine have been fairly constant, but poor markets have had a significant influence on the total amount of softwood harvested within the past few years.

With the exception of the spikes in total cords harvested in 2013 and 2017, jack pine volume has remained relatively constant over the past decade, generally hovering around 5,500 cords. In 2018, a total of 5,334 cords of jack pine was harvested. This was a 41% decrease from 2017, but generally on par with the average amount harvested over the past 10 years.

- 3) **Reforestation Program:** reforestation, be it natural or artificial, is a core building block of forest sustainability and a fundamental component of any forest management program. A successful reforestation program provides numerous benefits, some of which include: the restoration of forest productivity, fertility and environmental function; the assurance of a perpetual, sustainable supply of forest resources and amenities for future generations; the protection of soil and water quality; and the establishment and development of quality wildlife habitat. Newly regenerating stands are typically monitored 3 to 4 times, and sometimes more, over a 10-year period, to determine success.

Table 8 displays the summary of the reforestation program.

**Table 8: Bayfield County Forest Reforestation Program Summary (acres)**

Year	Planting				Seeding	Site Preparation				Maintenance			
	Red Pine	Jack Pine	White Pine	Other <sup>1</sup>	Jack Pine	Trench	Fire Plow	Scarify	Spray	Fire	Spray	Bud Cap	TSI <sup>2</sup>
2008	378	207	24	0	0	796	88	0	442	0	0	0	0
2009	487	415	0	0	0	726	72	0	348	40	0	0	0
2010	367	196	0	0	0	363	118	0	420	42	305	0	0
2011	319	153	35	68	0	900	88	0	186	21	324	0	0
2012	295	107	274	0	0	0	177	120	727	32	609	0	0
2013	281	174	92	0	558	264	0	40	0	0	449	239	0
2014	0	0	0	0	0	503	20	115	264	0	273	239	0
2015	62	0	129	0	202	717	0	99	634	0	0	239	1
2016	203	39	0	0	393	570	0	102	492	0	0	239	0
2017	36	2	0	0	460	279	0	115	585	0	0	71	46
2018	134	0	0	0	563	257	0	154	296	0	0	38	0
Avg.	221	108	46	6	199	477	47	79	391	11	163	92	8

<sup>1</sup> In 2011, tamarack and white spruce.

<sup>2</sup> Timber Stand Improvement - Hand release of established regeneration

- a) **Planting:** a total of 134 acres, on three different sites, were planted in 2018, nearly four times the amount of acreage that was planted in 2017. All sites were planted at a rate of about 800 seedlings per acre. All seedlings were 2-0 containerized stock and planted by contracted crews. A total of 107,200 seedlings were planted in 2018.

Also, bald cypress was planted (and seeded) in a few swamp hardwood areas as a means to study various options/alternatives of reforestation in the face of eventual EAB infestations. Bald cypress was planted in a roughly ½ acre patch of regenerating swamp hardwoods in the Iron River area. That site was also seeded with bald cypress. Additionally, a similar site was planted in Barnes and another site in Iron River was planted with a mix of cypress, white pine and white spruce. Bald cypress seed was dispersed at each location as well.

The artificial reforestation program has experienced some transformations over the past five years, which will continue into the foreseeable future, resulting in significantly less acreage being planted. In general, the primary reasons for the changes are as follows: re-planting of the old fuel break areas has been completed; a general lack of previously open area, which, in the past, were planted to red pine; a lack of mature stands of red pine that are ready for reforestation; movement towards an emphasis on jack pine regeneration in the Barnes Barrens Management Area; an emphasis on seeding when attempting to regenerate jack pine; and a significant decrease in stands that were severely defoliated from a significant outbreak of jack pine budworm in the early 2000's.

- b) Seeding: A total of 563 acres were seeded in 2018, an increase of about 22% when compared to 2017, and the largest seeding program to date. Of the seeded sites, 483 acres were seeded with jack pine and 80 acres were seeded with a mix of white pine and white spruce. At all locations, seeding occurred at a rate of about 4 ounces per acre (with local seed purchased from the WDNR nursery). A total of 121 pounds of jack pine seed, 20 pounds of white pine seed and 20 pounds of white spruce seed were applied in 2018. White pine and white spruce seeding was an attempt to increase species diversity in an otherwise poor quality, previously managed, northern hardwood stand, located in IRMU 6.

All seed applications are performed aurally, via a contract with the DNR. All seeded acres were previously trenched (two years prior) and sprayed (one year prior) to provide the best possible site for germination and recruitment. All planted and seeded sites are monitored on a routine and regular basis to determine success (see Forest Monitoring section below).

- c) Site Preparation: to prepare sites for future planting or seeding, a total of 257 acres were power trenched (for artificial reforestation) and 154 acres were scarified with a dozer and straight blade (for natural regeneration). A total of 296 acres were treated with chemicals to reduce potential competition for undesirable vegetation. All of the dozer scarification was accomplished with assistance from the DNR. All trenching and chemical applications were accomplished with contract crews. Dozer scarification occurred underneath an existing canopy of mature red oak to facilitate natural oak regeneration.
- d) Maintenance: in 2018, 0 acres were released from undesirable competition. Currently, most plantations are treated with herbicide prior to planting (see above), which, in combination with mechanical preparation, creates an exceptional site for young seedlings to develop, thus eliminating the need for release. In some instances,

release may still be required. However, the goal is to significantly reduce the need for release by treating future plantations prior to planting. Releasing young seedlings increases the risk of damage from herbicide, something we hope to eliminate by treating sites prior to planting.

A total of 38 acres of young jack pine plantations were treated with terminal bud caps to deter browsing from white tailed deer. This is roughly half the amount that was capped in 2017. All bud capping was accomplished with contracted crews. Assuming browsing pressure remains high in these stands, bud capping may be necessary every year for the next two or three years (or until trees have developed beyond the reach of white tailed deer). The stands not bud capped in 2018 had reached the minimum height requirements (typically 5 to 6 feet) and were removed from future capping schedules.

All capped jack pine sites were reforested via planting. It is believed that since nursery grown jack pine seedlings are very nutrient rich, they are more attractive to, and targeted by, deer as a food source. Seeded sites are not exhibiting the same level of browse pressure and are not expected to require additional measures of protection. Planted red pine are also, in general, not experiencing significant browse pressures. However, all stands are monitored on a regular basis and additional protections may need to be incorporated if significant browsing is discovered.

No additional timber stand improvements were performed in 2018. In 2017, a total of 46 acres was treated, by contractors, with mechanized hand tools (primarily brush saws). The primary goal of the treatment is to sever competing, undesirable competition in stands of regenerating northern hardwoods. In 2017, the focus of TSI was in gaps, which were created to facilitate natural regeneration. These stands contained significant, dense components of ironwood, which were outcompeting and suppressing desirable tree seedlings i.e. sugar maple, yellow birch, red oak, basswood, etc. Stands will be monitored to determine success. This is a common and developing problem. It is anticipated that TSI will become a more regular means of facilitating natural regeneration throughout many hardwood forest types.

### **More Information on Reforestation**

As previously stated, reforestation can be accomplished by either natural or artificial means. Table 8 above tracks annual reforestation accomplishments, but primarily as they pertain to artificial regeneration or when additional inputs are/were required by the Department (i.e. site preparation, release, bud capping, etc.).

Every stand that is managed by the Department is ultimately reforested. However, not all treatments are regeneration harvests. Some stands are thinned, where a smaller portion of the trees are removed, typically with the goal of improving development on higher quality stems. Termed even-aged thinnings (also improvement or intermediate harvests), these treatments generally target the removal of the poorest quality trees; those that exhibit poor form and/or vigor; and undesirable, diseased or otherwise unhealthy individuals. During the thinning process, trees are also removed to improve the development of adjacent higher quality stems, that are competing for the same limited resources i.e. light, nutrients, water,

etc. Stands that are managed with even-aged thinning practices are ultimately regenerated, but only when approaching the designated rotation age for that species.

Natural regeneration (either from seed or vegetatively via root suckers or stump sprouts) is the preferred method of reforestation in all hardwood types (i.e. aspen, birch, northern hardwood, oak), as well as some stands of conifer (primarily swamp conifer i.e. tamarack and black spruce, as well as some stands of white pine).

Hardwood types such as red oak and paper birch are reforested primarily with even-aged treatments (i.e. shelterwood, seed tree and/or clearcut) and typically require additional inputs from the Department to facilitate the natural regeneration process. Site preparation, competition control, the manipulation of light, timing of seed dispersal, etc all need to be considered when regenerating red oak and white birch. As a result, the reforestation process is monitored more intensively in these stands, as regeneration can be highly variable and the Department may need to act quickly if the stand is not responding to the treatment.

Hardwood types such as northern hardwood (typically dominated by sugar maple, with co-dominants of basswood and sometimes yellow birch) can be managed with even or un-even aged techniques. Maple isn't as fickle as red oak and typically doesn't require additional inputs from the Department to encourage adequate regeneration. However, when implementing un-even aged treatments (i.e. when gaps or small groups are incorporated to initiate a new cohort or age class), the Department is discovering some challenges with the process of natural regeneration.

On moderate or poorer quality sites, competition from ironwood has been a growing concern. Deer exacerbate this issue, as repeated browsing of the desirable regeneration (i.e. sugar maple, basswood, red oak, the birches, etc.) slows growth (and can eventually kill the tree) and allows less desirable or undesirable (i.e. ironwood) species to attain and maintain dominance. Once less desirable species attain dominance, development and growth of the stand is stagnated and future management potentially altered.

Gaps or groups comprise a relatively small percentage of the stand (typically 10 to 25%), so it doesn't take a large population of deer to eventually locate and browse the seedlings. As a result, most northern hardwood stands that are treated with gaps or groups are monitored intensively. Additional inputs may be required to facilitate the natural regeneration of desirable hardwood seedlings and the development of the stand.

Other hardwood types, such as aspen, regenerate prolifically after harvest and rarely require additional inputs or follow-up from the Department. These stands are regularly monitored as part of the Department's reconnaissance program. However, due to concerns with the potential impacts of a warming climate, the Department is in the process of establishing a more intensive monitoring program for regenerating stands of aspen.

Quaking aspen has been identified as one of many timbers type that could be negatively impacted due to changes in the climate. Stands developing on marginal sites are more inherently stressed and could be most at risk (i.e. sites that are nutrient poor). Monitoring will cover a cross section of habitat types, but will prioritize stands developing on sites classified, by the Department, as marginal or nutrient poor.

Table 8a summarizes the general management or reforestation goals for every completed (closed out) sale from 2011 through 2018 (total sales sold are also included). Management is basically categorized in one of three ways: 1) with natural regeneration as the reforestation goal; 2) with artificial regeneration as the reforestation goal; or 3) as an even aged thinning (or intermediate treatment), where reforestation will come at a later date.

**Table 8a: Summary of Treatments and Reforestation Activities on Completed Timber Sales (acres)**

Year	Natural Reforestation <sup>1</sup>	Artificial Reforestation <sup>2</sup>	Thinnings <sup>3</sup>	Total Completed Sales	Total Sales Sold
2011	2,264	638	742	3,643	4,156
2012	1,807	322	1,047	3,176	4,782
2013	1,305	662	946	2,912	4,177
2014	3,386	608	1,225	5,219	4,388
2015	3,317	803	646	4,766	4,958
2016	2,010	224	658	2,892	4,750
2017	2,298	814	981	4,092	4,101
2018	3,013	532	702	4,247	3,813
Average	2,425	575	868	3,868	4,391

<sup>1</sup> Natural reforestation refers to stands that will regenerate via seed located naturally on site, or vegetatively via coppicing or stump sprouts.

<sup>2</sup> Artificial reforestation refers to stands that will be physically planted or seeded by the Department.

<sup>3</sup> Thinnings encompass stands that were treated with even aged prescriptions (or intermediate harvests). These stands are eventually reforested (either naturally or artificially), at a later date, as per the designated rotation age for that particular timber type.

A timber sale is considered completed when every component of the contract has been met, to the satisfaction of the Department. This includes, but is not limited to, harvesting, hauling and stumpage payments, as well as all road maintenance and/or closure or other similar requirements.

Timber sales are sold under two year contracts and can be extended for another two to three years (and sometimes more). At any point during the contract period, a timber sale can go active. Once active, it is common for a contractor to harvest a portion of the sale and then move off, leaving more to address at a later date. It's also common for contract activity to carry over into another calendar year. A timber sale can still be classified as active even if all harvesting, hauling and stumpage payments have been met, but other contractual obligations are still outstanding i.e. road work or other similar requirements.

In Table 8a, the acres of completed sales are highly variable, ranging from a low of 2,892 in 2016 to a high of 5,219 in 2014. However, the total acreage of sold timber sales is generally relatively constant and stumpage revenues have been at record or near record highs in three of the past four seasons. It is also common for significant portions of a sale to be complete, but only remain open to satisfy a specific contract requirement or to remove a few loads of wood.

Of the completed sales (an average of 3,868 acres since 2011), a vast majority are prescribed to regenerate naturally, with an average of roughly 2,400 acres per year (or nearly 63%). An average of 575 acres are prescribed for artificial reforestation (approximately 15%) and 868 acres are treated with even-aged thinnings or intermediate treatments (approximately 22%). Red pine and red oak are the two most prominent timber types that receive even-aged thinnings (or intermediate treatments).



- 4) **Forest Monitoring Program:** forest inventory and reforestation/regeneration monitoring are vital components of any sound, sustainable forest management program. Accurate, up-to-date stand information is essential in the development of viable short and long term sustainable harvest goals. A successful regeneration program is paramount in the development of the next forested ecosystem. The accuracy of any sustainable harvest goal is only as good as the data from which it was derived. Monitoring stands, whether mature or newly regenerating, on a routine and regular basis is an essential element of the forest management process.

The forest monitoring program has evolved significantly over the past few years. In the past, the primary forms of forest monitoring focused on compartment level stand updates (or reconnaissance) and artificial reforestation surveys. Forest reconnaissance, or updating stand information, on a compartment level basis has been a staple component of the program for the past two decades. Today, in addition to compartment level inventory and artificial reforestation monitoring, forest type (stand level) inventory and natural regeneration monitoring (FRM) have been added to the program. Each facet of the monitoring program is summarized below.

- a) **Compartment Level Reconnaissance.** Starting in 2001, the goal was to update roughly 10,000 acres of forest annually, until all compartments have been re-inventoried, and then repeat the process. By targeting individual compartments (which range from a few hundred acres in size to a few thousand), efforts could be directed to one general area, thus increasing efficiency and also allowing for the incorporation of smaller landscape level management decisions.

Table 9 displays the summary of compartment/stand updates from 2006 through 2018.

**Table 9: Compartment Inventory Summary (acres)**

<b>Year</b>	<b>Number of Compartments</b>	<b>Accomplishment</b>
2006	23	18,030
2007	13	11,002
2008	15	10,807
2009	4	2,872
2010	5	4,079
2011	11	9,728
2012	9	8,135
2013	10	9,316
2014	8	5,014
2015	7	5,320
2016	6	5,784
2017	6	4,107
2018	9	8,613
Average	10	7,908

At roughly 172,000 total acres, a complete re-inventory was estimated to take 17 to 18 years. In 2018, the last compartment was assigned (all 202 compartments have now been re-inventoried), thus essentially completing the first full round of compartment updates in about 18 full years (though some of the final data entry of these last compartments will occur in CY 2019). In 2018, a total of 8,613 were inventoried.

Starting in CY 2019, the compartment update process will begin again. As in the past, the goal will be to inventory about 10,000 acres of the forest every year, for the next 17 to 18 years.

- b) Stand Level Inventory. In addition to compartment level inventories, the Department determined there was a need to obtain up to date information across various primary forest types. Generally, the reasons for obtaining current information across a primary forest type are varied and can include: prioritizing management across stands that are generally all the same age; prioritizing regeneration harvests; fine tuning prescriptions to more accurately determine short and long term sustainable harvest goals; and monitoring health and vigor to determine when management is necessary (especially important on over mature stands). Whatever the reason, additional stand information is collected to help in the overall decision making process.

Table 10 summarizes primary forest type inventory efforts since 2014.

**Table 10: Primary Forest Type (Stand Level) Inventory Summary (acres)**

Year	Jack Pine	Red Oak	Northern Hardwood	Swamp Hardwood	Total
2014	2,002	3,260	0	0	5,262
2015	0	5,423	2,187	0	7,610
2016	0	439	843	0	1,282
2017	0	0	4,269	104	4,373
2018	0	0	2,462	1,392	3,854
Total	2,002	9,122	9,761	1,496	22,381

The focus of stand level monitoring, across a forest type, is generally on mature stands, where information is required to assist in short or long term management level decisions, as described above. Stand level monitoring began in earnest in 2014, when mature jack pine stands were prioritized. Red oak and northern hardwood were prioritized in 2015 and 2016. And northern hardwood inventory was continued in 2017. In 2018, 2,462 acres of northern hardwood (completing the inventory of the mature stands) and 1,392 acres of swamp hardwood were inventoried.

- c) Artificial Reforestation Monitoring. Artificial reforestation pertains to all sites that were planted or seeded. All sites that are reforested with artificial means are monitored on a routine and regular basis, to ensure the stand is developing as intended. On planted sites, monitoring occurs every 1,2,3,5 and 10 years after planting. After the 10 year, assuming the reforestation activity was successful, the stand is release from intensive regeneration monitoring and will be observed as part

of the various management processes (i.e. compartment level inventory, timber sale establishment, etc.).

Seeded sites are monitored on a slightly different scale. Because seed can take multiple years to germinate, the first reforestation survey occurs at year 4. Depending on the results, another survey will be prescribed at year 7, with a final count at year 10. If a survey discovers an issue or poor results, another count may be prescribed earlier, especially if a follow up treatment may be necessary.

Table 11 summarizes the artificial reforestation monitoring results since 2012.

**Table 11: Artificial Reforestation Monitoring Summary (acres)**

Species	2012		2013		2014		2015		2016		2017		2018	
	Seeded	Planted	Seeded	Planted	Seeded	Planted	Seeded	Planted	Seeded	Planted	Seeded	Planted	Seeded	Planted
Jack Pine	69	510	69	1,142	0	1,090	0	477	0	535	558	145	202	326
Red Pine	0	1,597	0	1,000	0	1,124	0	883	0	760	0	638	0	876
White Pine	0	47	0	42	0	271	0	112	0	16	0	49	0	0
Other	0	68	0	0	0	68	0	0	0	108	0	0	0	0
Total	69	2,222	69	2,184	0	2,553	0	1,472	0	1,419	558	832	202	1,202
Grand Total	2,291		2,253		2,553		1,472		1,419		1,390		1,404	

In 2018, a total of 202 acres of seeded jack pine sites were monitored, while 326 acres of planted jack pine and 876 acres of planted red pine were also surveyed. In total, 1,404 acres of sites reforested with artificial means were monitored in 2018. This represents a slight increase (roughly 1%) when compared to 2017 and is generally on par with the total amount of monitoring that has occurred since 2015.

In general, monitoring results show that red pine stands are progressing as expected, though one stand did exhibit higher than normal levels of browsing pressure (at roughly 13%, which is high for stands of planted red pine). Jack pine seeded sites are still too young to quantify, but appear to be progressing as expected.

One overarching concern with seeded jack pine stands is the potential impacts of white tailed deer. Planted jack pine stands have required bud caps to deter over browsing, but seeded sites are thought to be less attractive (not as nutrient rich as nursery grown stock).

- d) Natural Regeneration Monitoring (Forest Regeneration Metrix - FRM). How a stand will be reforested after a regeneration harvest is one of the most critical aspects of forest management. As previously stated, every stand that is managed is ultimately reforested, however, the methods of reforestation can be somewhat variable, depending, in part, on the timber type and existing conditions.

Table 8a summarized the general type of regeneration activity that is prescribed to stands upon completion. Of stands that are reforested after management, natural regeneration is prescribed roughly 63% of the time. Like artificial reforestation, natural regeneration monitoring is an essential part of any forest management activity.

Table 12 summarizes the total amount of natural regeneration monitoring (acres) that has occurred on the Bayfield County Forest since 2012.

**Table 12: Natural Regeneration Monitoring Summary (FRM)<sup>1</sup>**

Cover Type	2012	2013	2014	2015	2016	2017	2018	Total
Northern Hardwood	27	102	0	92	352	563	1,381	2,517
Red Oak	417	272	0	190	618	675	846	3,018
Aspen	0	0	0	0	0	0	799	799
Swamp Hardwood	0	0	0	0	0	0	23	23
Swamp Conifer	0	0	0	0	0	0	5	5
Total	444	374	0	282	970	1,238	3,054	6,362

<sup>1</sup> Utilizing the protocols outlined in the Forest Regeneration Matrix

Natural regeneration monitoring is accomplished utilizing the protocols outlined in the Forest Regeneration Matrix (FRM). Please refer to the 2019 Bayfield County Forest Annual Work Plan for more detailed information on FRM. As FRM was developed, the Department slowly incorporated it into the process. The initial target were stands of red oak and northern hardwood (the two hardwood types that have been experiencing some issues in the reforestation process), but other timber types were added in 2018.

Starting in CY 2019, the goal is to incorporate FRM on all stands that will be regenerating naturally after management. Monitoring parameters and protocols are still in the process of development and will be fine tuned as more information is collected.

For northern hardwood and red oak, FRM surveys occur at intervals of 3, 5 and 10 years, post harvest. If issues are discovered or if natural regeneration is anticipated to be a problem, additional surveys may be applied to help determine the next course of action. For all other types that will be regenerated naturally, an initial survey will be conducted at year 5, post harvest. If natural regeneration is expected to be an issue, a survey may be conducted earlier. Also, if an issue is discovered at year 5, additional surveys may be applied in successive years to help determine the next course of action.

In general, the results of FRM have been variable. Most stands of red oak and many stands of northern hardwood are not regenerating as desired. The germination and initial establishment of desirable tree seedlings has generally not been an issue, but development and recruitment have been.

In most regenerating stands of red oak and northern hardwood, the impacts of over browsing by white tailed deer have been identified as one of the most limiting factors in the reforestation process. A system and methods to analyze FRM data is still in development and monitoring will continue to be accomplished on all stands in the process of being reforested.

A total of 3,054 acres of naturally regenerating stands were monitored in 2018. This was nearly 2.5 times greater than the amount surveyed in 2017. The goal for 2019 is 6,804 acres!

- e) Continuous Forest Inventory (CFI). In 2018, the Department began the development and implementation of a new long term forest monitoring program, termed continuous forest inventory (CFI).

As part of the CFI program, a total of 667 permanent plots will be randomly located throughout the forest. The plots will be established throughout all cover types on the forest and will conform with Wisconsin DNR CFI protocols. For more detailed information on the CFI program, please see the 2019 Bayfield County Forest Annual Work Plan.

The primary purpose of implementing a permanent and continuous forest inventory is to collect statistically sound stand information that will be used to report on the status and trends of the forest. The multitude of data that will be collected as part of every plot will be used to track variables like, but not limited to: forest extent, forest cover (by type), volume, growth, quality, mortality, removals, regeneration, habitat, health (both at the stand level and forest wide), carbon sequestration, invasive species, soils, down woody debris, biomass, insects and disease, herbivory, and more.

A total of 99 CFI plots were established in 2018. The goal for 2019 is 167 plots. It should take roughly four years to complete the initial round of plot establishment and data collection. Starting at year five, the data collection process will be repeated, with the goal of complete re-inventory every five years. Also, the process of data analysis will begin in CY 2019, with assistance from the Wisconsin DNR. Table 13 displays the total number of CFI plots established in 2018 (by primary timber type).

**Table 13: CFI Plot Establishment per Timber Type (number)**

<b>Primary Timber Type</b>	<b>Total Plots</b>
Aspen	31
Jack Pine	14
Northern Hardwoods	14
Red Pine	14
Red Oak	10
Upland Grass	3
Lowland Brush - Alder	2
Lowland Grass	2
Red Maple	2
Scrub Oak	2
Swamp Hardwoods	2
Right of Way	1
White Birch	1
White Pine	1
<b>Total CFI Plots</b>	<b>99</b>

Establishing 667 CFI plots equates to about 1 plot for every 260 acres of forest land. At this rate, the plot design will provide a sampling error not to exceed 5% across all timber types and 10% within each two-inch size class, up to 17 inches in diameter. Additionally, one CFI plot actually consists of two, 24' radius plots spaced 120' apart (from plot centers). Within each plot is a 6.8' radius subplot (where regeneration, understory vegetation and other similar data is collected). When completed, a total of 1,334 plots will be established.

From a total acre of accomplishment perspective, with one CFI plot representing approximately 260 acres of county forest land (actually 258 acres), a total of 25,532 acres were inventoried/examined as part of the CFI program in 2018.

- f) Other Monitoring. In addition to the various monitoring efforts listed above, the Department has also established deer exclusion fencing to analyze the impacts of browsing. Two larger scale, woven wire fences and numerous small scale poly exclusion areas.

The two large scale deer exclusion fences were both constructed with eight foot tall, high tensile woven wire. A 29 acre exclusion is located south of Oulu and was installed during the spring of 2007. While a 50 acre exclusion is located south of Cable and was installed during the fall of 2008. Both fences were constructed on stands being actively managed for red oak. Both locations are routinely monitored to study the growth and development of regeneration and to better understand the potential influences of browsing by deer.

Both fence locations have also been recently harvested, where the overstory was removed to allow established regeneration to recruit. Each site will continue to be monitored to evaluate the effectiveness of the fence. The fences will also be maintained throughout this process, with the goal of eventual removal once seedlings have established and attained dominance.

A few smaller scale fences (ranging in size from 6'x6' to nearly ½ acre, made from high density plastic) have also been constructed on the forest. These are much smaller in size, but still intended to monitor the impacts of excessive browsing by white tailed deer.

In addition to stands of red oak and northern hardwood, other cover types like swamp conifer, white pine and white birch are being monitored to better understand the potential impacts of deer browse. To date, a total of 15 smaller fences are being maintained on the forest and monitored on a regular basis.

Information collected from the deer exclusion fences will be used to assist in the development of future management strategies, especially with regards to regenerating trees that are also preferred browse species i.e. red oak, paper birch, jack pine, white pine, (and now most of the traditional northern hardwood species).

- g) Total Monitoring Across All Programs. Whether new timber sale establishment, timber sale close-out, compartment level inventory, stand level inventory, artificial regeneration monitoring, natural regeneration monitoring, or one of the many reforestation activities, the Department collects information on a significant amount of county forest land every year. primary

Table 14 summarizes the total amount of acres that are analyzed by the Department per year, from 2012 to 2018.

**Table 14: Summary of Principal Activities Occuring on the Bayfield County Forest (acres)<sup>1</sup>**

Year	New Sales	Closed Sales	Compartment Inventory	Stand Update	Artificial Monitoring	Natural Monitoring	Reforestation Activities	Total
2012	4,588	3,176	8,135	595	2,291	444	2,341	21,570
2013	4,348	2,912	9,316	517	2,253	374	2,097	21,817
2014	4,331	5,219	5,014	5,773	2,553	0	1,414	24,304
2015	4,289	4,766	5,320	8,102	1,472	282	2,083	26,314
2016	4,718	2,892	5,784	1,586	1,419	970	2,038	19,407
2017	4,354	4,092	4,107	4,838	1,390	1,238	1,594	21,613
2018	3,775	4,247	8,613	4,461	1,404	3,054	1,442	26,996
Average	4,343	3,901	6,613	3,696	1,826	909	1,858	23,146

<sup>1</sup> Primary activities/goals that are tracked per year.

In 2018, a total of nearly 27,000 acres were managed by the Department (or about 16% of the total amount of county forest land). This represents an increase of nearly 25% compared to 2017 and the greatest amount of land managed on record.

This number also does not include the amount of land monitored as part of the Continuous Forest Inventory (CFI) program. If including the amount of land inventoried as part of the CFI program (25,532 acres), the total amount of monitoring in 2018 would nearly double, to 52,528 acres (or roughly 31% of the total amount of county forest land).

### **Barnes Barrens Management Area**

This special management area was formally designated in 2012 with the goal of developing and maintaining critically important Pine Barrens habitat through the simultaneous management of jack pine and open/early successional barrens. Among other things, the Barrens Management plan defines operational parameters and guidelines that must be followed to achieve the desired future condition. For detailed information on the Barrens, please review the 2019 Bayfield County Forest Annual Work Plan or visit our website at <https://www.bayfieldcounty.org/243/Plans> to review the Plan.

Below is a list of the primary accomplishments within the Barrens Management Area since 2012:

- Established a timber sale to address the remaining portion of standing timber in the path of the core road (which will be located around the entire perimeter of the core area).
- Established timber sales in Zones 1 and 2 to maintain to the harvest cycle for each zone.

- Currently, approximately 3.5 miles of the core road has been completed (approximately 1 mile of the core road remains to be completed, which should be accomplished in 2019).
- Knapweed has been treated along heavily infested roads since 2013 (see Invasive Species section below for more information).
- As per the Barrens plan, all reforestation efforts focus on jack pine. Each year, sites are trenched, site prep sprayed, and aerial seeded with jack pine.
- In 2018, the Department completed the second year of monitoring permanent vegetation plots, located within the Barrens area, to study the effects of various chemical mixtures on the development of native plants.
- To date, roughly 66% of the core area has been established as open barrens (the core area is roughly 1,000 acres in size). Another 61 acres of mature timber is currently under contract within the core area. When that sale is complete, a little over 72% of the open core area will be established.
- 285 acres in the southern half of the core area was burned in 2018. This was the first burn of newly established areas within the core (though portions of the old fuel break, also located within the core, have been burned in the past).

### **Invasive Species and Insects and Disease**

Over the past few years, the Department has become more involved in the treatment of invasive species on the county forest. Invasive species have the potential to alter the ecological relationships among native species, negatively affect the natural functions and structure of forested ecosystems, and can negatively impact the economic value of the forest.

Currently, non-native invasive species like spotted knapweed and common buckthorn and native invasive species like black locust are the most common plants treated on the forest.

Table 15 describes the summary of invasive species treatments on the county forest from 2013-2018.

**Table 15: Invasive Species Treatment Summary**

<b>Year</b>	<b>Road R.O.W. (mi)<sup>1</sup></b>	<b>Hand Treatment (ac)<sup>2</sup></b>
2013	0	9
2014	50	15
2015	48.5	13.5
2016	48.5	11.5
2017	52.5	24
2018	42	51
<b>Average</b>	<b>40</b>	<b>21</b>

<sup>1</sup> Spotted knapweed treatment in the Barnes Barrens area.

<sup>2</sup> Primarily small isolated patches of buckthorn and black locust.

In 2018, approximately 51 acres were hand treated, by Department staff. Of the that total, 31 acres were treated to manage buckthorn and 20 acres to manage black locust. Most of the treatments involved foliar chemical applications, but stump treatments occurred on stems that were too large to be treated with foliar spray.



It should be noted that, to date, buckthorn infestations are generally isolated and fairly widely distributed on any given acre (in other words, the 31 acres treated in 2018 were not blanketed with a sea of buckthorn). However, more buckthorn is discovered every year and will most likely require more resources to control.

In 2015, the Department received a \$37,500 Sustainable Forestry Grant for the initial treatment of spotted knapweed on 48.5 miles of forest roads in the Barnes Barrens Management Area. Herbicide was used to treat spotted knapweed in the first attempt to reduce further spread into the barrens. The project focuses on roads that are the most heavily infested, but more still needs to be done. This grant helped to kick start the program, which will require additional inputs in order to keep the problem in check.

In 2018 a few segments of road were removed from the treatment area, as spotted knapweed management in those areas was successful. Rather than treat all roads every year, another goal of the program is, once under greater control, to treat only those sections where knapweed has developed or expanded.

A total of 42 miles were treated in the Barnes Barrens Management Area in 2018. This represents the least amount of road treated since the program began and indicates that good progress is being made in the battle to control the spread of spotted knapweed in the Barrens.

The expectation is that some roads will need multiple treatments before the infestation is under control. Follow-up treatments will also be required to reduce the potential for spread. As knapweed becomes more manageable, it is also anticipated that less chemical will be required. Additional roads may also need treatment and will be evaluated on a case by case basis.

Oak Wilt. In 2018, three cases of oak wilt were confirmed on the Bayfield County Forest. Two of the detections were made in Cable and one in Barnes. Please see the Bayfield County Forest 2019 Annual Work Plan for more information on Oak Wilt.

As a result of the detection, the infected trees needed to be addressed. After an oak wilt infected tree or pocket is located and confirmed, guidelines/protocols are adopted that help to determine how the trees/areas will/should be treated. Models or charts that estimate the number of trees located within potential root grafting distance of a known infection source are applied.

Once the perimeter is established all oak trees within it are double girdled and herbicide is applied to kill the trees, generally starting at the outside (of the perimeter) and working toward the center. Once the trees are killed, the oak wilt infected tree(s) are treated. Once all the trees are confirmed to be dead the uninfected trees may be harvested.

In 2018, a total of 18 red oak trees, including the two infected with oak wilt, were treated as per the recommended guidelines. Treating the impacted area took one full day with a few staff. Once more trees are detected, sites may no longer be managed in this manner and may require additional inputs or contract work (and potentially additional out of pocket expense).

### **Land Transactions**

The Department will continue efforts to acquire properties on a willing seller, willing buyer basis,

when advantageous to the long-term goals of Bayfield County. A priority will be given to land located within the existing county forest blocking and/or areas possessing special or unique natural resource values. All acquisitions are typically enrolled in County Forest Law and managed as part of the County Forest.

Table 16 summarizes all County Forest Law (CFL) entries (acquisitions) and withdrawals (divestments) from 2004-2018.

**Table 16: County Forest Law (CFL) Entries and Withdrawals**

Year	Entries <sup>1</sup>	Withdrawals <sup>2</sup>	Net Change
2004	278.00	40.00	238.00
2005	160.00	0.00	160.00
2006	80.00	0.00	80.00
2007	0.00	0.00	0.00
2008	320.00	161.08	158.92
2009	0.00	4.20	-4.20
2010	0.00	0.00	0.00
2011	0.00	0.23	-0.23
2012	0.00	0.00	0.00
2013	40.00	4.25	35.75
2014	40.00	0.00	40.00
2015	2,601.80	0.09	2,601.71
2016	0.00	3.36	-3.36
2017	200.00	90.20	109.80
2018	0.00	82.71	-82.71
Total	3,719.80	386.12	3,333.68
Average	247.99	25.74	222.25

<sup>1</sup> Land added to the county forest, typically via purchase, donation, trade or tax delinquency.

<sup>2</sup> Land removed from the county forest, typically via sale or trade.

On occasion, the county will also divest of land. Divestment is typically only considered if the land in question will be put to a higher and better use and will provide greater benefits to the citizens of Bayfield County. All divestments need to be approved by the Forestry and Parks Committee and the County Board. Also, before land is formally divested, it first needs to be withdrawn from County Forest Law (CFL). Requests for withdrawal are submitted to and reviewed by the DNR. County forest land cannot be divested until a request for withdrawal has been approved by the state.

Since 2015, the Department has made a few significant land transactions. In December 2014, the Department received preliminarily approval for two Knowles-Nelson Stewardship County Forest Land Acquisition Grants. The grants were officially awarded in June 2015. As a result, Bayfield County purchased 1,392 acres from Meteor Timber and 463 acres from Lyme Timber. Additionally, the county provided a match of 747 acres of county owned, non-county forest land. In total, 2,602 acres of land were added to the county forest in 2015.

Under the current Stewardship model, by using the appraised value of county owned land as the required match, the Department can tailor projects that significantly reduce (or eliminate) out of pocket expenses. The Meteor Timber and Lyme Timber acquisition projects totaled roughly \$2.616 million (including the cost of land, appraisals and other associated fees). The county received approximately \$2.265 million from the Stewardship grant (which included the appraised value of

matched lands). As a result, the county spent roughly \$350,000, out of pocket, to purchase over \$2.6 million in productive forest land.

In 2016, the Department acquired 200 acres of land, formerly owned by the Wisconsin DNR, near Mt. Ashwabay, in the Town of Bayfield. The property was purchased entirely with county funds at a total of \$130,650 (or roughly \$659/acre). The transaction took a little longer to finalize and was officially transferred in 2017.

When combining the land purchased in 2016/2017 and the properties made part of the 2015 Stewardship project, the Department has added a little over 2,800 acres to the county forest over the past three years.

In June 2018, the Department submitted another large Stewardship acquisition project, utilizing portions of county owned properties as a match. The original application included the purchase of 1,110 acres from Ceres Timber, for the appraised value (subsequent grant value) of 181.25 acres of county owned lands, and 3,040 acres of the Bibon Swamp (for a total of 3,221.25 acres of match lands). In addition, the county would contribute \$66,000 in cash. In total, the project was valued at roughly \$1.322 million.

The application was pre-approved by the DNR, but received an objection from the Wisconsin Joint Finance Committee (JFC). After much discussion with members of the JFC, it was determined that the objection was raised primarily due to the amount of wetlands being used as a match. In an attempt to reach a compromise with the JFC, Bayfield County removed the Bibon Swamp completely from the project and submitted a revised application. The revised application was re-submitted in October 2018. As a result, the total size of the project was reduced significantly.

The revised application reduced the potential total acres purchased from 1,110 to 510; the total acres used as a match would decrease from 3,221.25 to 181.25; the total acres included as part of the grant (acquisition and match) would decrease from 4,331.25 to 691.25; the total value of the project would decrease from about \$1.322 million to roughly \$667,000; and the total amount of cash required as part of the match would increase from approximately \$66,000 to around \$153,000.

It should be noted that a total of \$160,000 in cash was generated from the sale of 160 acres of land to the Red Cliff Band of Lake Superior Chippewa (two separate 80 acre parcels located within the reservation, one in 2017 and the other in 2018). Applying these funds towards a future Stewardship grant for county forest land acquisition was one of the contingencies of sale. The revised grant, if approved, would utilize most of the proceeds from these two land sales (both 80 acre sales are shown as divestments in Table 16).

Though not part of the 2018 accomplishments, the Stewardship project was approved in February 2019. The acquisition was completed in March 2019. As part of the approved project, Bayfield County was required to enroll the Bibon Swamp in CFL, without compensation. In other words, the county did not receive match value for the property, but still had to enroll it in CFL (like all other properties included in the project).

In total, 510 acres of land was purchased from Ceres Timber for \$630,000. To cover the applicant's share of the project, the county contributed the appraised value of 181.25 acres of county owned land and \$153,250 in cash (proceeds from the land sales to Red Cliff). A total of 691.25 acres of

land will be enrolled in CFL, in addition to the 3,040 acres of the Bibon Swamp (the swamp will be enrolled as special use). After subtracting the 160 acres sold to Red Cliff (which were removed from CFL) a net grant total of 3,571.25 acres will be added to County Forest Law in 2019.

Also in 2018, 2.71 acres of land, located along Star Route Road in the Town of Bayfield, was withdrawn from CFL and leased for a communications tower. The property will remain county owned, but communications towers are not an allowable land use in County Forest Law.

## **ROADS AND RECREATION (on the County Forest)**

The Forestry and Parks Department maintains over 1,400 miles of roads and trails on the forest. These roads and trails provide a plethora of recreational opportunities. Some of the more popular pursuits include: hiking, hunting, mountain biking, snowmobiling, ATVing, cross country skiing, dog sledding, horseback riding, wildlife viewing, firewood gathering and more.

### **Primary Roads**

Approximately 38 miles are classified as primary gas tax roads, which receive maintenance funds from the Wisconsin DOT (based on \$336/mile, but prorated depending on total miles enrolled in the program). These roads serve as primary access routes into portions of the county forest. A few of these roads located in the Towns of Barnes and Hughes also play an integral role in the wildfire protection plan.

The Department performed routine annual inspections on every mile of primary road to monitor for both road quality and invasive species in 2018. The Department, with assistance from the DNR, also performed annual routine maintenance on the rights of way for each primary road.

Maintenance usually is in the form of mowing, but can also include herbicide, if encroaching vegetation is unable to be mowed. A total of nearly 25 miles of primary road right of way was mowed in 2018. An extensive amount of repair work and grading occurred on the Flag Road. In addition to repairs associated with the 2018 storms (see below), 30 loads of gravel was added to the Flag Road as part of routine maintenance. Numerous other roads also incurred some minor routine maintenance in 2018.

### **Town Road Aids and Other Town Payments**

In 2010, Bayfield County developed the Town Road Aid Fund. This fund was created to help improve problem areas on Town Roads that provide critical access to the county forest. Town Road Aids were initially funded at 1% of total annual timber sale revenues (enacted once actual revenues exceed the budgeted amount). All projects are selected and administered by the Department.

Starting in 2013, Bayfield County increased the funding level to 2% (with a cap of \$80,000). As a result, \$80,000 annually has been made available to Towns, including 2018. Of the 29 County Forests in the State of Wisconsin, Bayfield County is the only one to offer this unique additional source of funding. In early 2019, the Forestry and Parks Committee voted to increase this funding level to 3% and also to remove the cap. The 3% level, with no cap, will be included in the 2020 budget and subject to approval by the County Board.

Once again, all Towns submitted good projects. Most projects revolve around the purchase of material i.e. gravel, but some include culverts and equipment rentals. Some of the larger awards in 2018 included: the Towns of Clover and Port Wing partnered on a project that would repair sections of Battle Axe Road, an important haul route; \$9,000 to the Town of Barnes; \$8,500 to the Town of Bayfield; and \$7,250 to the Town of Hughes.

Table 17 summarizes the total Town Road Aid Program in 2018.

**Table 17: 2018 Town Road Aids Award Summary**

<b>Town</b>	<b>Project Location (Road)</b>	<b>Funding Amount</b>
<b>Bayfield</b>	Jammer, Echo, Henkens	\$8,500.00
<b>Barnes</b>	Multi-Road Haul Route	\$9,000.00
<b>Tripp</b>	Battle Axe	\$5,000.00
<b>Bayview</b>	Smith Fire Lane	\$5,000.00
<b>Bell</b>	Klemik	\$5,000.00
<b>Hughes</b>	Multiple Sand Roads	\$7,250.00
<b>Orienta</b>	Sorenson	\$4,000.00
<b>Highland<sup>1</sup></b>	Motts	\$4,000.00
<b>Iron River</b>	Ruth Lake	\$5,000.00
<b>Clover</b>	Battle Axe, Lenawee	\$10,500.00
<b>Port Wing</b>	Battle Axe	\$8,000.00
<b>Russell</b>	Lamont	\$3,500.00
<b>Cable</b>	Spider Lake Fire Lane	\$4,250.00
<b>Namakagon</b>	Old Grade	\$1,000.00
<b>Total</b>		<b>\$80,000.00</b>

<sup>1</sup> Douglas County

The average award amount was a little over \$6,000. The program has been very well received, with many town roads seeing significant improvements and providing much better access to county forest lands.

In addition to the Town Road Aid program, Townships receive other revenues due to the presence of county forest lands within Town jurisdictions. As per County Forest Law, the county is required to distribute at least ten percent of total net stumpage revenues, that are generated from the management of the county forest, to each Township (that contain county forest lands).

Distribution of funds is prorated and based solely upon the total amount (percentage) of acres located within each Town. Townships also receive an annual payment from the state. Termed PILT (payment in lieu of taxes), each Township receives \$0.30 per acre for every acre of county forest land.

Table 18 displays the total amount of revenue distributed or awarded to the Townships as a result of containing county forest lands.

**Table 18: Total Annual Payments to Townships**

Year	10% Timber Sales	Town Road Aids	DNR PILT <sup>1</sup>	Total
2010	\$204,766.34	\$22,738.17	\$51,433.88	\$278,938.39
2011	\$247,706.64	\$20,160.63	\$51,433.88	\$319,301.15
2012	\$269,675.87	\$25,397.99	\$51,433.88	\$346,507.74
2013	\$390,410.42	\$26,967.56	\$51,433.88	\$468,811.86
2014	\$453,483.13	\$78,082.08	\$51,433.88	\$582,999.09
2015	\$499,305.78	\$80,853.86	\$51,433.88	\$631,593.52
2016	\$504,199.95	\$80,000.00	\$51,597.92	\$635,797.87
2017	\$500,990.25	\$80,000.00	\$51,597.92	\$632,588.17
2018	\$456,224.36	\$80,000.00	\$51,597.92	\$587,822.28
Avg.	\$391,862.53	\$54,911.14	\$51,488.56	\$498,262.23

<sup>1</sup> Payment made by the DNR based on \$0.30 per acre of county forest land in each Township

In 2018, the total 10% stumpage revenue sharing payment from the county was \$456,224. This represented a decrease of roughly 9% when compared to the amount distributed in 2017. Prior to 2013, towns received an average annual total payment of roughly \$220,000. When combining the 10% payment, the Town Road Aids and the DNR PILT payment, a total of nearly \$588,000 was awarded to the Townships.

### **Recreation - Events and Use Agreements**

The county forest is used for a variety of recreational purposes. Non-motorized uses such as cross-country skiing, mountain biking, hunting, trapping, hiking, nature watching and dog sledding are extremely popular. Motorized uses such as snowmobiling and ATVing are also very popular. The demand for recreational use on public land is increasing every year.

Table 19 displays the number of recreational use permits per recreation type that were approved since 2015. All approved permits were for events that utilized a portion of the Bayfield County Forest.

**Table 19: Summary of Approved Events**

Type of Event	Number of Events per Year			
	2015	2016	2017	2018
Mountain Biking	7	7	6	8
Cross Country Skiing	6	5	7	9
Running	3	4	4	3
Dog Sledding	1	1	1	1
Orienteering	1	0	1	1
Total	18	17	19	22

Recreational events are part of that increasing demand. Every year, numerous events are hosted on county forest land. All organized events required a permit, which is approved by the Forestry and Parks Committee.

In addition to daily general recreational use, trails on the county forest also play an integral role in numerous popular organized events. Such events include, but are not limited to, the American

Birkebeiner, Apostle Islands Sled Dog Race, Chequamegon Fat Tire Festival and the Cable Area Off-Road Classic mountain bike race.

The Forestry and Parks Committee approved 22 organized events on county forest land in 2018, an increase of nearly 16% when compared to 2017, and the most events approved to date. Mountain biking and cross-country skiing were the most common types, with a vast majority of events occurring in the Cable block. These events bring numerous participants and spectators to the area and are excellent examples of multiple use. The number of requests for mountain bike and cross-country skiing events has increased steadily over the past decade.

The Department also maintains land and/or recreational use agreements with a variety of organizations, some of which include: the American Birkebeiner Association, Chequamegon Area Mountain Bike Association (CAMBA), North Country Scenic Trail Association, North End Ski Club, Ashwabay Outdoor Education Foundation (AOEF), National Fish Hatchery, Town of Barnes, Bayfield County Snowmobile Alliance, Trails North ATV Club, and more.

In general, the use agreements highlight specific areas or trails within the forest and outline management or use requirements expected from each organization. Use requests are treated on a case by case basis and require approval from the Committee. Department staff regularly meet with permit holders regarding trail maintenance, timber sale activities and other recreation related concerns or issues.

Table 20 displays the approximate miles of designated roads and trails currently located within county forest boundaries.

**Table 20: Summary of Designated Roads and Trails on Bayfield County Forest Land (miles)**

Road or Trail Type	Total Miles
Primary Road	38
Secondary Road	817
Tertiary Road	365
Unclassified Road	0
Snowmobile Trails <sup>1</sup>	115
ATV Trails <sup>1</sup>	71
Cross Country Ski Trails	39
Mountain Bike Trails	54
Hiking Trails	15
Dog Sled Trails	44

<sup>1</sup> Does not include trails located on town roads, other public lands or private lands.

In addition to designated trails, the county forest offers an abundance of recreational opportunities on roads and trails that are not designated for a specific use (i.e. signed and maintained by friends or use groups). For example, of the approximate 1,400 miles of roads and trails on the county forest, 42% can be traveled with a licensed highway vehicle, 72% with an off-highway vehicle (i.e. ATV,UTV) and 91% with a snowmobile. In addition, all are open to hiking and virtually all are open to mountain biking, horseback riding and cross-country skiing.

The Department staff works closely with all permitted recreational user groups on the establishment and/or maintenance of trail systems. Recreational use agreements with organized clubs (as described above) continue to be pursued at every opportunity.

### **Recreation - Non-Motorized (managed by the Department)**

Recreational trails, whether motorized and part of the state funded system, or non-motorized and part of a designated network, are an integral and important component of any forest management program. Over the past few years, the Department has emphasized the importance of recreation, incorporating efforts to maximize, or better capture, the recreational potential of the forest, including the construction of the two rustic yurts. At nearly 172,000 acres and spread out over the length of Bayfield County, the county forest provides, or has the potential to provide, a plethora of recreational opportunities.

Incorporating recreation in typical forest management strategies can sometimes be a challenge. Individuals recreating on the county forest will encounter forest management. Existing designated trails are often located within, or adjacent to, active, or future, timber sales. However, this interaction provides excellent opportunities to educate and explain general forest management practices.

Management practices are rarely altered due to the presence of a recreational trail. The Department prefers to work closely with use/friends groups to explain the upcoming harvest, as well as identify any potential issues that could arise. Combining education, direct collaboration with various user groups and occasional slight timber sale modifications, the Department can capture the sustainable management potential of the Forest and provide exceptional recreational opportunities, on the same piece of ground.

All trails are open to most forms of non-motorized use, but only a small portion are actually designated and maintained for a specific form of recreation. Trail conditions can also be highly variable. Of those that are maintained for designated uses, most are managed through partnerships/agreements with non-profit organizations, and some are maintained directly by the Department.

Currently, there are two major areas of the county forest where non-motorized recreation is more organized and intensive. These areas are the low-motorized blocks in Cable and near Mt. Ashwabay. In these areas, the Department has developed strong partnerships with numerous non-profit organizations on the designation and maintenance of the trails.

- Cable Area. The Chequamegon Area Mountain Bike Association (CAMBA) is responsible for the development and management of over 300 miles of mountain bike trails within the region. This includes trails located on the Bayfield County Forest, Sawyer County Forest and Chequamegon Nicolet National Forest, in addition to some privately owned lands.

In the Cable block of the Bayfield County Forest, CAMBA maintains approximately 24 miles of sustainably built singletrack mountain bike trails and an additional roughly 11 miles that occur on logging roads, railroad grades or similar features. These trails connect to those located on the Chequamegon Nicolet National Forest and Sawyer County Forest to form one



of the most extensive mountain bike networks in the nation. CAMBA maintains a recreational use permit with the Department that describes the partnership and how trails are maintained or developed on the Forest. Routine maintenance work and minor trail improvements occurred in 2018.

Numerous mountain bike related events are hosted on trails located within the county forest in the Cable area. Some of the most popular include: CAMBA hosts the Festival of Trails; the Cable Area Chamber of Commerce hosts the Cable Area Off-Road Classic; Life Time Fitness hosts the Chequamegon Fat Tire Festival; and the American Birkebeiner Association hosts the Fat Tire Birkie (in the winter). All of these events are extremely popular and bring thousands of riders and spectators into the area.

Also in the Cable block, the North End Ski Club and American Birkebeiner Association (ABA) maintain cross country ski and snowshoe trails on the county forest. Some of the ski trails utilize the same portion of ground as the bike trails. Snowshoe trails are also maintained on most of the single track trails. The North End Ski Trail network totals roughly 21 miles on county forest land, while the snowshoe network is about 4 miles. Both organizations maintain recreational use permits with the Department. Fat bike trail (big tired mountain bikes) are also gaining in popularity. In 2018, a few miles of trail were also groomed for fat bike use. Maintenance work and minor trail improvements occurred in 2018.

The North End Ski Club also maintains a warming cabin, outhouse and storage building on county forest land. The cabin and outhouse are open for public use. The storage building is used to house much of the gear and grooming equipment required to maintain the trails. They also host numerous cross country ski events including their flagship North End Classic race.

The American Birkebeiner Association maintains roughly three miles of the famed Birkie trail on county forest land. They also maintain a newly constructed warming/storage building and privy. The world famous American Birkebeiner cross country ski race, as well as the Kortelopet, Prince Haakon and Birkie tour ski events are all held on county forest land. The ABA also hosts running events and the Fat Tire Birkie (see above).

Starting in 2016, the Department entered into a recreational use agreement with UP North Guided Tours. This is a for-profit company offering guided snowshoe, hiking and biking (including winter fat biking) tours in the Cable block. As part of the agreement, UP North will assist with the maintenance of the trails in that area.

- Mt. Ashwabay Area. In the northern portion of the Forest, the Ashwabay Outdoor Recreation Foundation (AOEF) maintains an extensive network of cross country ski and snowshoe trails, in part, on county forest land (also on county land not part of the county forest i.e. Jolly Trails). Trails are groomed for classic or skate skiing. AOEF hosts numerous events (both summer and winter events) on the trails including: the Peel Out 5k Run; WinterDASH running event; and a Fat Tire Expo/Time Trial. In addition, numerous other groups host events on these same trails, including CANSKI's Summit Cross Country Ski Race. The Bayfield and Washburn school districts have also used portions of the trails for various ski and running meets. NORHardw@@ds

In 2018, the Department worked with AOEF to construct a new section (loop) of cross country ski trail that connected to an existing network. The connection totaled a little less than one mile, with roughly 0.65 miles of new construction and about 0.25 miles on existing logging roads. In exchange for some maintenance work on the cross country ski trails, AOEF helps groom access routes into each yurt (ski trail passes are also included for each yurt rental).

Recently, a branch of CAMBA (CAMBA North) was formed to develop a mountain bike trail network, primarily on county forest land located near Mt. Ashwabay. In 2011, the Department approved CAMBA’s proposal to construct up to 30 miles of new singletrack mountain bike trails on county forest land.

In 2018, approximately 4.5 miles of new singletrack trail was constructed, partially funded with budgeted county capital monies. All new construction occurred on county forest land. A trailhead parking area was also constructed on county forest land, off Whiting Road, to provide another access point to the trail system (the primary parking area is located off Ski Hill Road).

To date, roughly 19 miles of sustainably built, single track mountain bike trails have been constructed, roughly 18 miles of which is located on county forest land. The 4.5 miles that were constructed in 2018 essentially marked the completion of the first phase of the project. Many of these trails are also being maintained in the winter for fat tire mountain bike use.

Trail counters have been installed at both trail head locations (one off Ski Hill Road and one off Whiting) as a means to monitor and better understand use patterns. The counter off Ski Hill Road has been in place since 2015, while the counter off Whiting was installed in 2017.

Table 20a summarizes the total amount of trail uses originating from each trail head location.

**Table 20a: Trail Counter Summary - CAMBA Trails  
Mt. Ashwabay Location<sup>1</sup>**

<b>Year</b>	<b>Ski Hill Rd. Access</b>	<b>Whiting Rd. Access</b>	<b>Total</b>
2015	3,543	0	3,543
2016	3,965	0	3,965
2017	3,293	1,485	4,778
2018	4,068	1,615	5,683
Avg.	3,717	1,550	4,492

<sup>1</sup> Number of individual uses per trail head location.

The trail counters were placed in strategic locations in order to capture as much use as possible. In general, counters from each trail head are capturing different users. However, there could be instances where a trail user trips the counter at one trail head and rides a good portion of the entire system, thus tripping the counter at the other trail head. Trail users could also access the system from other locations, not serviced by one of the trail heads. The conventional thought is that such uses are offsetting, resulting in solid use data.

As per Table 20a, use of the CAMBA trails at Mt. Ashwabay has increased steadily since 2015, especially with the addition of the second trail head. Total use in 2018 was nearly 5,700, an increase of over 60% when compared to 2015.

In addition to the Cable and Mt. Ashwabay areas, designated non-motorized recreational trails and/or areas are located on numerous other county owned properties (on county forest lands, as well as non-CFL properties). Some of the more popular designated trails include the North Country Trail, Jerry Jolly Trails, Lost Creek Falls Trail and the newly acquire Swenson Forest Preserve/Siskiwit Falls property.

- North Country Trail. Approximately 8 miles of the North Country Trail travels within the county forest. These trails are maintained by local chapters of the Association. In 2018, North Country Trail volunteers completed a roughly 1.4 mile relocation of the trail between Banana Belt Road and Pero Road, south of Iron River. This re-route moved the trail off an older logging road and through a forest of younger aspen. A total of roughly 1,400 volunteer hours went into the relocation.
- Jerry Jolly Trails. Some additional work was accomplished on the Jolly trails in 2018. Gravel was placed on the access road, parking area and portions of the trail. Work also began in 2017 to re-evaluate the Jolly network to determine current uses, the intensity of those uses, the condition of existing infrastructures and explore future direction options/potential. Trail counters are installed at the trail head or primary access point of the Jolly network to help determine the amount of use the system receives. Similar activities will continue in 2019.
- Lost Creek Falls Trail. Upgrades to the Lost Creek Falls trail began in 2015. Accomplishments over the past four years, include, but are not limited to: over 1,600 feet of new hand built trail; nearly 1,300 feet of new boardwalk, some with hand rails; nearly 40 feet of new foot bridges; nearly 1,000 feet of gravel on new and existing trail surfaces; upgrades to and expansion of the trail head parking area; installation of new trail signs and markers; installation of a new informational kiosk; removal or trimming of potentially hazardous or threatening trees; and the installation of location/directional signs on County Highway C. To date, the total cost of improvements has been just under \$40,000.

Table 20b summarizes the total use of the Lost Creek Falls trail, from the Trail Dr. trail head location, since 2016.

**Table 20b: Trail Counter Summary  
Lost Creek Falls<sup>1</sup>**

Year	Number of Users
2016	6,327
2017	7,193
2018	5,468
Avg	6,329

<sup>1</sup> Number of individual users from Trail Dr. trailhead.

The response to these improvements has been tremendous (the Department has a trail counter installed at the trail head). The average use of the trail has increased from about 2 users per day prior to improvements (averaged throughout the year) to about 20 users per day. Peak use at the Lost Creek Falls trail has been in excess of 80 people per day! The exceptional amount of use has also created the need for additional maintenance.

Since 2016, a counter has been installed on the trail as a means to monitor use. In 2016, a total of 6,327 people used the trail. That number was 7,193 in 2017, but dipped in 2018 to 5,468 (a decrease of roughly 23%). The counter only monitors use from the primary parking area off Trail Drive. The falls are also accessible from the snowmobile trail off Klemik Road, which is not captured by the counter.

More boardwalk and/or gravel will be needed on the Lost Creek Falls trail in the future to minimize pressure on the landscape, while continuing to provide an enjoyable and sustainable hiking trail.

- Swenson Forest Preserve/Siskiwit Falls. In 2018, with much assistance from the Bayfield Regional Conservancy (now Landmark Conservancy), Bayfield County acquired roughly 103 acres of land in the Town of Bell, adjacent to the Siskiwit River. The property was purchased with a NOAA CELCP grant (administered by Wisconsin Coastal Management) and matching funds from donations and landowner bargain sales (all secured by the Conservancy).

Bayfield County ultimately agreed to accept ownership of the property (the Siskiwit River Estuary Protection project, as titled in the grant) for primarily two reasons: 1) in recognition of the unique and exceptional natural resource values contained throughout the parcels, including numerous waterfalls on the Siskiwit River, as well as ecologically significant forests and wetlands, and agreed that these values should be protected and conserved; and 2) in recognition of the current public use values and future potential of the property, as individuals and families have enjoyed recreating on these parcels for generations.

As part of the acquisition, the county also agreed to receive and administer the NOAA CELCP grant. The overall goal of the grant was to provide permanent protection and conservation of the ecological, recreational, historical and aesthetic resources of this unique site.

The grant award was in the amount of \$186,841 for land acquisition and \$7.932 for construction/infrastructure costs (i.e. parking lot development, access road improvements, signs, etc). These funds required a match from the recipient. A combination of the grant funds, donations received by Landmark Conservancy and a bargain sale from the landowners were used to purchase the property. The total cost of the acquisition was a little over \$305,000 (including all associated fees, taxes, survey work, etc.). The total value of the project is expected to be just under \$390,000.

By accepting these funds, the county was mandated, by the terms of the grant, to manage the property in a manner that will preserve the qualities of these values. In addition, eventually a conservation easement with the Conservancy will be recorded on this property. This easement will further require the county to ensure the protection and conservation of these

various important resources. The entire property was re-zoned to W Conservancy in 2018.

Preliminary plans for infrastructure improvements were established in late 2018. The yellow cottage (located on the west side of the river, north of Siskiwit Falls Road) was removed in the fall of 2018. The well was capped, the site was leveled and converted into a secondary parking area, to provide access to the upper falls (located south of Siskiwit Falls Road). For detailed information on future plans for the Siskiwit property, see the Bayfield County Forest 2019 Annual Work Plan.

There are numerous other organized recreational events and/or activities that utilize portions of the county forest. The Bayfield Chamber hosts the popular Apostle Islands Sled Dog Race, which, in part, utilizes trails on county forest land located in the Town of Bayfield (with a small portion in the Town of Bayview). Every year, the Department works closely with all user groups on the maintenance of and/or improvements to existing trails.

Periodically, new trails or re-routes are also addressed. All are treated on a case by case basis, with larger projects needing Committee approval. Groups are also informed of current or future timber sale activities located adjacent to or in the vicinity of designated trail networks. Occasionally, slight timber sale modifications may be incorporated into the sale design, and are treated on a case by case basis. The Department is also incorporating trail counters on some of the more significant recreation networks with the goal of better understanding use. Information obtained from the counters will also be very beneficial for future planning and development efforts.

The Department is in the process of developing a new recreation strategy that will, in part, better identify existing infrastructure and future potential, as well as define future direction. Non-motorized and motorized recreation, throughout the county, will be explored as part of the process.

## **Recreation - Yurts**

Table 21 summarizes the rates of occupancy and total net revenues per yurt from 2016-2018.

**Table 21: Yurt Occupancy (Nights Rented) and Total Net Revenue<sup>1</sup>**

Year	Bayfield - Evergreen <sup>2</sup>		Bayfield - Terra Cotta <sup>3</sup>		Cable <sup>4</sup>		Total	
	Occupancy	Net Revenue	Occupancy	Net Revenue	Occupancy	Net Revenue	Occupancy	Net Revenue
2016	42	\$2,368.60	0	\$0.00	15	\$837.90	57	\$3,206.50
2017	269	\$15,640.51	0	\$0.00	168	\$9,904.86	437	\$25,545.37
2018	260	\$14,840.87	30	\$1,712.41	180	\$11,452.48	470	\$28,005.76
Total	571	\$32,849.98	30	\$1,712.41	363	\$22,195.24	964	\$56,757.63

<sup>1</sup> The following fees/taxes apply to each reservation: Airbnb 3%; State sales tax 5.5% (Airbnb started collecting state sales tax in 2018);

Cable room tax 4% (only at Cable location); Bayfield room tax 6.5% (only at Bayfield locations).

<sup>2</sup> The Bayfield - Evergreen location went live on October 8, 2016.

<sup>3</sup> The Bayfield - Terra Cotta location went live in September 2018.

<sup>4</sup> The Cable location went live on November 12, 2016.

During the summer of 2016, two yurts were constructed on county forest land. One yurt was constructed in the Cable area and one near Mt. Ashwabay (now named Evergreen – it’s green in color). In late summer of 2018, a third yurt was constructed, a little north of the first one located near Mt. Ashwabay (named Terra Cotta – reddish clay in color).

In 2018, occupancy at the Bayfield location was exceptional, averaging 71% for the entire year! Peak use was during the months of June, July and August, where occupancy rates were nearly 100% (93%, 97% and 97%, respectively). The least amount of use occurred in February and December, with occupancy rates of 36% and 48%, respectively. The average number staying at the yurt is around 3 to 4 people. The Terra Cotta yurt was live for less than three months in 2018, but still totaled 30 nights rented. Using an average of 3.5 people per night and 290 nights rented, combined, in 2018 a total of over 1,000 people stayed in the Bayfield yurts and recreated on the surrounding county forest.

Occupancy at the Cable location was lower than that experienced at Bayfield. The overall occupancy rate at the Cable location was nearly 50% on a total of 180 nights rented. This was an increase of 7% when compared to 2017. Peak use in Cable was during the months of February, July and August, with occupancy rates of 61%, 58%, and 61%, respectively. The least amount of use occurred in the months of April and May, with occupancy rates of 23% and 42%, respectively. Using the same average rate of occupancy as the Bayfield location, at 3.5 people per night and 180 nights, in 2018 a total of nearly 650 people stayed in the Cable yurt and recreated in the surrounding county forest.

When combining all yurt locations, a total of 470 nights were rented in 2018, for an average occupancy rate of 62% (which is a slight improvement when compared to 2017). When considering the abundance of rave reviews the Department has received from very happy renters, around 1,700 people had a wonderful time recreating on the county forest while staying in the yurts.

Total net revenues received in 2018 from all yurt rentals was \$28,006. The Evergreen yurt generated roughly \$14,800, which was a slight decrease when compared to 2017; Terra Cotta generated roughly \$1,800; and Cable generated roughly \$11,500, which was a 16% increase when compared to 2017.

As part of the process, the yurts are subjected to taxes (state, local and room taxes), as well as fees from Airbnb. Airbnb charges a flat rate of 3% per transaction. Airbnb now also collects state and local taxes (which are now paid by the renter, as part of the total fee associated with renting a yurt). The room tax for the Town of Bayfield is 6.5% and the room tax for the Town of Cable is 4%.

Construction of the third yurt was completed in early fall 2018 at a total cost of roughly \$47,500, all inclusive, including furnishings, associated fees and permits. In addition to the construction and installation of the third yurt, the parking area at the Bayfield location was expanded in order to accommodate the additional vehicles.

The entire construction process of the Terra Cotta yurt included, but was not limited to: location and clearing of the site, improvements to the primary access routes, construction of the yurt foundation and deck, installation of the yurt (purchased through Pacific Yurts), construction of the outhouse and firewood lean-to, establishment of the fire-ring and benches, installation of the furnishings, including a woodstove, two bunkbeds and associated mattresses (full on bottom and twin on top), table and chairs (inside the yurt), picnic table, establishment of the parking area (for the Bayfield site), installation of signs and kiosks, development of rental policies and procedures (all reservations are currently handled through Airbnb), acquisition of all required local and state permits and variances, obtaining a UDC permit, additional engineering plans/fees, procurement of

firewood (firewood for the woodstove is provided by the county) and development of informational and promotional materials.

## **PARTNERSHIP WITH THE DNR**

In accordance with s. 28.11, the DNR oversees the county forest program. As per that partnership, the DNR provides an abundance of professional, technical and financial assistance to counties having lands entered in the county forest program. As part of the technical assistance, the DNR allocates a total of 46,000 hours, statewide, to counties having lands enrolled in the county forest program.

The amount of technical assistance (termed “time standards”) dedicated to each county is determined through a fairly complex formula. Past, present and future workloads are incorporated into the formula to determine the level of assistance required by each county.

Timber sale establishment, reforestation, regeneration monitoring, reconnaissance, timber sale administration, road and trail maintenance, as well as time associated with certification, work planning, various meetings, other professional services, and all associated paperwork (and more) are all part of the calculation. If the total request from all counties exceeds the roughly 46,000 hour annual threshold, a general proration is adopted to equally adjust the final figure accordingly.

Time standards were re-calculated in Fiscal Year 2019 (in CY 2018). On the Bayfield County Forest, the annual time commitment allocated by the DNR to the county, after the pro-rate is applied, was calculated at 3,916 hours (time standards were 3,395 hours per year from FY 2014-2018). The significant increase in hours was a direct reflection of the growth in various forest management programs that occurred over the past five+ years, including, but not limited to: timber sale establishment, timber sale administration, reforestation, regeneration monitoring (including FRM), forest reconnaissance (compartment and stand inventory), invasive species control, etc.

This calculation was technically established for FY 2019 through FY 2022, but the formula was re-evaluated (throughout the entire county forest program) in early 2019 to determine overall effectiveness. As per the re-evaluation, the total time standards were altered again. Effective starting July 1, 2019, the annual time commitment allocated by the DNR to the county will be 3,640 hours. This calculation will be effective from FY 2020 through FY 2022.

As part of the annual time commitment, the DNR provides assistance in a variety of areas, including, but is not limited to:

1. Establishment of timber sales. Roughly 20% to 25% of the annual sustainable harvest goal is accomplished by DNR foresters.
2. Forest reconnaissance (both compartment and stand updates).
3. Forest stand data entry (WisFIRS, see below) and maintenance.
4. Continuous Forest Inventory (CFI) plot sampling/data collection.
5. Regeneration monitoring, both artificial and natural.
6. Timber stand improvements (TSI).
7. Timber sale administration.
8. Mechanical site preparation for natural regeneration.
9. Mechanical site preparation for artificial regeneration.

10. County forest road and trail construction and maintenance.
11. Road right of way and wildlife (game) opening mowing/maintenance.
12. Support from professional forest management specialists, including forest hydrologists, wildlife biologists, forest ecologists, forest health specialists, GIS specialists, etc.
13. Support, manage and administer the county forest group certifications, for both SFI and FSC (both forest certificates are administered by the DNR through a group format).
14. Assistance in the development and maintenance of the comprehensive land use and annual work plans.
15. Function as a catalyst for the transfer of technology and professional or scientific information, as well as providing opportunities for training or enhancement.
16. Financial support through various grants, aids and loans.

## **FOREST CERTIFICATION**

The Bayfield County Forest is dual, third party certified (as part of the Wisconsin County Forest Program group certificates, which are managed by the DNR). For the past ten plus years, the Department has maintained forest certificates with both SFI (Sustainable Forestry Initiative) and FSC (Forest Stewardship Council). The DNR maintains all aspects (administratively and financially) of both the SFI and FSC group certificates.

The standards, principles and/or strategic direction of each non-profit, independent forest certifying body are developed by their respective board members and staff, which include representation from conservation organizations, academia, tribal entities, family forest owners, private forest landowners, public forest landowners and the forest products industry. Each certifying organization is further structured into three sectors (SFI) or chambers (FSC), incorporating environmental, social and economic components. This diversity reflects the wide variety of interests in the forest management community.

As part of certification, the county forest management program is audited annually against the strict standards, guidelines and principles of each independent organization. To date, every year, Bayfield County has either met or exceeded each standard.

Maintaining forest certification isn't a mandate. The Department invites each certifying entity to analyze and scrutinize our management of the forest. We ask them to subject our forest management practices, plans and principles to their strict, rigid and dynamic internal standards, principles and guidelines. Maintaining one certificate, let alone two, is a significant commitment and demonstrates the county's desire to ensure the public that we have some of the best managed forests in the country.

In 2018, the Department continued working with each independent certifying body, as well as the DNR, by providing requested information as part of the annual surveillance certification audit (performed by each program). The general objective of the annual surveillance audit is to assess the certificate holder's conformance with each firm's program requirements. Once again, the WCFA was given numerous accolades regarding the quality and diversity of forest management across all ownerships. Bayfield County continues to maintain dual certification through both FSC and SFI.

This collaboration will help to ensure that the county forest is sustainably managed, not only to the standards and expectations of those auditing and overseeing the program, but also to the



professional principles and values exhibited and demanded by all staff members within the Department.

In 2019, Bayfield County will be one of four counties that will be visited as part of the five year, full re-certification audit (Douglas, Ashland and Barron are the other counties selected for the full audit). Audits generally occur in late summer (most likely August). This collaboration will help to reaffirm that the county forest is sustainably managed, not only to the standards and expectations of those auditing and overseeing the program, but also to the professional principles and values exhibited and demanded by all staff members within the Department.

## PERMITTED USES

Permits are issued by the Forestry and Parks Department for events, rights-of-way, timber storage, private property access, firewood, miscellaneous forest products, and other recreational activities.

Table 22 displays a summary of permits issued on the forest from 2008 through 2018 (a summary of permitted events can be found in Table 19).

**Table 22: Bayfield County Forest Summary of Issued Permits and Approvals**

Year	Fire Wood	Balsam Boughs	Cones*	Christmas Trees	Access	Events	Disabled Hunting	Storage
2008	360	8	0	1	2	9	3	1
2009	423	5	1	1	0	10	3	1
2010	436	5	1	1	3	10	3	2
2011	503	7	1	6	9	10	10	2
2012	441	6	1	7	8	12	7	2
2013	406	16	13	3	6	17	6	2
2014	486	9	6	4	7	21	5	2
2015	394	8	5	5	10	18	9	1
2016	331	10	3	4	6	17	10	1
2017	285	19	1	4	7	19	6	1
2018	250	12	2	6	11	20	9	1
Avg.	392	10	3	4	6	15	6	1

\* specifically advertised for jack pine cones in 2013

Firewood comprises the vast majority of the total permits issued on an annual basis. In 2018, 250 firewood permits were issued. In general, the total amount of firewood permits have decreased markedly since the all-time high was established in 2011 (503 permits issues).

Since 2011, the total amount of firewood permits issued has decreased by approximately half. Firewood permits are free of charge and are available online (and have been so for the last few years). The vast majority of permit applications come via the website. The relatively mild winters may be the primary reasons for the decline in firewood permits. If permit requests continue to decline, the Department may consider incorporating methods of advertising in an attempt to alert (or remind) the public of this free permit opportunity.

A permit to collect wild edibles was also re-approved in 2018. A permit to harvest/collect tamarack stumps was also approved in 2018. Both permits were new in 2015 (tamarack stumps) or 2016 (wild edibles), are fairly unique in scope and will be monitored to determine long term viability.

Permits for balsam boughs were down by roughly 37% when compared to last year (which was a record year for bough permits). Access permits were at an all time high in 2018, with a total of 11 permits issued (which was an increase of roughly 57% when compared to 2017). Otherwise, all other permits were relatively stable or aligned closely to the general annual average.

The Department is also in the process of developing a maple sugaring permit system, where low/poor quality hardwood stands could be tapped for maple syrup production. A pilot maple tapping project was approved in 2019, the results of which will be used in the development of a formal permit. If the pilot is successful, the goal is to develop the permit in 2019 and provide the public with tapping opportunities starting in CY 2020.

**Sand and Gravel**

Sand and gravel is extracted and sold from county managed pits, to be used on approved municipal projects. All projects are reviewed and acted upon by the Committee.

The Department maintains two pits on the county forest: the largest one being in the Town of Bayfield, commonly referred to as the Sand River Pit (which is also where the staging of the Apostle Islands Sled Dog Race is held); with a smaller one off the end of Tulip Lane, in the Town of Russell. These pits are primarily used by local municipalities, as well as the Red Cliff Tribe, for the maintenance of local infrastructure.

Table 23 displays the total amount of sand and gravel and revenues received from 2008 through 2018.

**Table 23: Sand and Gravel Summary**

<b>Year</b>	<b>Yards</b>	<b>Value</b>
2008	6,120	\$3,060.00
2009	300	\$150.00
2010	12,589	\$9,441.75
2011	751	\$563.25
2012*	13,029	\$19,544.00
2013	0	\$0.00
2014	11,000	\$16,500.00
2015	0	\$0.00
2016	0	\$0.00
2017	12,750	\$19,125.00
2018	0	\$0.00
Avg.	5,140	\$6,216.73

\* Highway 13 Re-Paving Project

Most revenue received from the sale of sand and gravel is deposited in a non-lapsing account for eventual site reclamation. A total of \$0.00 was generated from sand and gravel in 2018. As displayed in Table 23, activity in the pits is highly variable and generally occurs once every few years.

## WILDLIFE HABITAT IMPROVEMENT/MONITORING

Forest openings, dominated by forbs and grasses, are important habitat for a great diversity of wildlife species. Since the mid 1970's, numerous, small forest openings have been maintained on the forest to encourage this diversity of habitat. The openings are relatively small in size (average about 1 acre) and are spread throughout the county forest (although they are more numerous in the Bayfield peninsula). Each opening is treated about every five years to discourage encroaching woody vegetation.

Table 24 displays a summary of the wildlife opening maintenance program, performed on county forest land, from 2008 through 2018.

**Table 24: Summary of Maintained Wildlife Openings on County Forest Land**

Year	Mowed Number	Mowed Acres	Hand Treated <sup>1</sup> Number	Hand Treated <sup>1</sup> Acres	Total Number	Total Acres
2008	44	50	77	60	121	110
2009	62	70	53	24	115	94
2010	45	44	50	57	95	102
2011	46	53	52	24	98	77
2012	0	0	76	68	76	68
2013	59	52	63	53	122	105
2014	34	40	48	25	82	65
2015	24	32	50	55	74	87
2016	51	36	47	33	98	68
2017	37	44	46	36	83	80
2018	94	97	19	13	113	110
Average	45	47	53	41	98	88

<sup>1</sup> using a mix of herbicide and hand cutting

In 2018, 19 wildlife openings, totaling 13 acres were maintained by hand, using a mix of herbicide and cutting. Openings are also scheduled for mowing, typically four out of every five years. There were 94 openings mowed in 2018 for a total of 97 acres. In total, 113 openings, covering 100 acres were treated in 2018. All work was completed by DNR staff, using a combination of DNR and county equipment.

In 2008, a breeding bird monitoring project was developed for the county forest. In 2008 and again in 2009, 350 permanent diurnal and 40 nightjar points were completed. An additional 297 diurnal and 17 nightjar points were taken in 2010. The remaining portion of the forest was completed in the spring of 2011. In total, 1,200 diurnal and 200 nightjar points have been taken.

In 2018, the Department contracted with the Natural Resource Research Institute (University of Minnesota-Duluth) to analyze the bird survey data and develop a functional application that would utilize the information. The result was the development of a shiny app and summary report. The application will be used to measure bird/habitat associations, anticipate how forest management may influence these relationships and predict general species occurrence. The report also provided recommendations for future work/analysis. We are still periodically working with the DNR and

other resource professionals to assist in additional/supplemental bird and/or other wildlife monitoring projects.

One related project involves the use of conspecific attraction to help in the monitoring for the presence of Kirtland's Warblers in the Barnes Barrens Management Area. Conspecific playback literally involves the broadcasting of the primary songs of a species, with the aid of sound equipment, to encourage individuals to settle in an area.

In 2014, the DNR detected one male Kirtland's Warbler, with no females or nesting being located. In 2015, three males were detected, with no females or nesting being located. In 2016, the first confirmed nesting and successful fledging of Kirtland's Warblers in Bayfield County occurred in the Barnes Barrens Management Area. All five nestlings successfully fledged. In 2017, three males were observed (one of those males was a banded 2016 nestling). However, no females or nest activity was located in 2017. A male and female nested in 2018 and hatched five young. Unfortunately, the nest failed due to an unknown cause.

The Barnes Barrens Area provides exceptional habitat for the endangered Kirtland's Warbler. If breeding success continues and an extensive population begins to develop, this area will be a prime example of how intensive, sustainable forest management can provide critical habitat for a variety of rare species.

The Barnes Barrens Area also contains one of the highest populations of sharp-tailed grouse in Wisconsin. In 2017, partly as an attempt to maintain the genetic diversity of the sharp-tailed grouse population in the Moquah Barrens, the DNR, in partnership with numerous other agencies, trapped over 200 birds in NW Minnesota and released 67 of them in the barrens.

One of those birds (a radio collared female) made her way down to the Barnes Barrens Area core area, promptly established a nest site, mated, laid 10 eggs, and hatched at least six chicks. An indirect accomplishment through a joint effort of numerous partner agencies with the goal of maintaining a healthy and genetically diverse population of sharp-tailed grouse.

Over the past few seasons, field work has been accomplished within the Barnes Barrens to create a serviceable road around the entire 1,000 acre, permanently open core area. Numerous miles of road have either been constructed or improved towards this effort. Only a few miles remain to be constructed.

In some cases, road construction is an added requirement on adjacent or nearby timber sales, but most of the work is accomplished by the Department (oftentimes with assistance by the DNR). Timber sales, and subsequent reforestation efforts are also accomplished in accordance to the Barnes Barrens management plan.

The Barnes Barrens Management Area has been very well received by the professional community. The plan has been viewed as a ground-breaking model that blends sound, landscape level forest (pine barrens) management, with the maintenance and development of optimal and perpetual wildlife habitat for a variety of species, including many of greatest conservation need.

## FINANCIAL ASSISTANCE – GRANTS AND AIDS

Financial assistance plays a major role in helping to achieve annual and long-term objectives.

In 2018, a little over \$97,000 was received from the major grants and aids. This was a decrease of over 32% when compared to 2017. Reimbursement from the FEMA grant (in 2017, from work that was completed in 2016) was one of the primary reasons for the decrease.

Table 25 outlines some of the major grants and aids awarded to the Department from 2008 through 2018. Every award listed in the table, with the exception of the Arbor Day and FEMA grants, has come from the State of Wisconsin.

**Table 25: Bayfield County Forestry and Parks Department Summary of Major Grants and Aids<sup>1</sup>**

Year	County Forest Administrator	Wildlife Habitat Improvement	County Forest Road Aid	Sustainable Forestry	County Conservation	Arbor Day	FEMA	Knowles-Nelson Stewardship	Total
2008	\$31,933	\$16,929	\$10,440	\$39,720	\$4,125	\$0	\$0	\$0	\$103,146
2009	\$35,762	\$16,945	\$12,126	\$33,000	\$2,289	\$0	\$0	\$0	\$100,122
2010	\$44,039	\$8,472	\$11,390	\$6,205	\$3,807	\$20,400	\$0	\$0	\$94,313
2011	\$44,039	\$8,472	\$11,347	\$0	\$0	\$46,202	\$0	\$0	\$110,060
2012	\$46,877	\$8,472	\$11,330	\$0	\$6,500	\$18,450	\$0	\$0	\$91,629
2013	\$47,814	\$8,416	\$11,896	\$46,329	\$0	\$12,450	\$43,945	\$0	\$170,849
2014	\$52,885	\$8,015	\$11,917	\$0	\$4,183	\$0	\$0	\$0	\$77,000
2015	\$51,210	\$7,991	\$11,918	\$0	\$0	\$13,260	\$0	\$2,259,857	\$2,344,237
2016	\$51,382	\$7,986	\$11,942	\$37,500	\$0	\$20,250	\$0	\$0	\$129,059
2017	\$53,595	\$8,068	\$11,953	\$0	\$24,211	\$4,340	\$41,467	\$0	\$143,635
2018	\$52,938	\$8,058	\$11,849	\$0	\$8,014	\$16,336	\$0	\$0	\$97,195
Average	\$46,589	\$9,802	\$11,646	\$14,796	\$4,830	\$13,790	\$7,765	\$2,259,857	\$314,659

<sup>1</sup> Where awarded funds were received per calendar year.

The Sustainable Forestry grant and County Conservation Aids tend to be the only state awards that are variable. Both are awarded based on the state fiscal year and revenues are received after projects are completed. In some cases, a project can be completed in one year, with actual reimbursement received the following year.

The Sustainable Forestry grant is also competitive with other county forest programs, and, therefore, not guaranteed. The Arbor Day grant is privately funded and also competitive. Funding from this grant covers trees purchased as part of the planting program.

The Knowles-Nelson Stewardship and Federal Emergency Management Agency grants are also very sporadic, but, when awarded, have the potential to be substantial. Both are listed in Table 25, primarily as a reference.

Additionally, many grants are awarded in a specific calendar year, but full or partial re-imbursement is not realized until the project is complete. Also, most grants are awarded by state or federal agencies and are based on the fiscal year, with a contract length of typically two years. Most can also be extended, without penalty, for another full year. A good example is the Wisconsin Habitat Partnership Fund grant (Pittman-Robertson funds) that was awarded in 2018. Roughly \$51,000 in grant funds, for work to be completed in the Barnes Barrens, was awarded to the Department. Work will occur in 2018 and 2019 to complete the project and funds will be received in CY 2019.

In 2018, the Department entered into another agreement (Fire MOU) with the state, this time to assist in the suppression of forest fires within the State of Wisconsin. When requested, and available, select Department staff will provide assistance, in the form of labor and equipment, in the suppression of forest fires. In 2018, the Department assisted the DNR in fire related activities, as per the MOU, for a little over 200 total hours. All time and equipment use was reimbursed by the state.

### **GOOD NEIGHBOR AUTHORITY (GNA)**

In spring 2016, Bayfield County entered into a GNA Memorandum of Understanding (MOU) with the DNR. As part of the MOU, the county agreed to become a contractor of the state, with the ultimate goal of assisting in the establishment of timber sales on federal land.

Program contracts are established with the state on an annual basis and subject to a mutually agreed upon scope of work. All work performed by the county as part of the GNA MOU is accomplished outside of normal business hours. As a result, the focus on, and completion of, core Department goals and objectives are not impacted by the MOU.

The scope of work defines the level of involvement the Department is willing to provide, outlines general goals and expected accomplishments and establishes an estimated budget. All salary, fringe, supplies, services and overhead costs, contributed by the county as per the GNA program contract, are reimbursed by the state.

The scope of work is subject to annual revisions and Department involvement is highly dependent on opportunities located within the Washburn Ranger District of the Chequamegon-Nicolet National Forest. The scope of work generally involves, but is not limited to: initial stand assessments; prescription development and writing; timber sale boundary establishment; timber marking and cruising; timber sale write-up; and timber sale administration.

Table 26 summarizes GNA activity since 2016.

**Table 26: Summary of GNA Activities (2016-2018)**

<b>Calendar Year</b>	<b>Fiscal Year</b>	<b>No. of Stands</b>	<b>Total Acres</b>	<b>Total Hours</b>	<b>Total Cost</b>	<b>Revenues Received<sup>1</sup></b>
2016	2017	15	381	326	\$21,033.35	\$0.00
2017	2018	20	675	371.5	\$23,960.56	\$39,627.93
2018	2019	17	889	333.75	\$22,080.09	\$9,393.10
Total		52	1,945	1,031.25	\$67,074.00	\$49,021.03

<sup>1</sup> Revenues are generally received the year after work has been completed.

In 2016 (the first year of the MOU), the county entered into a program contract with the DNR to manage 381 acres of red pine (15 stands) within Washburn Ranger District. It was estimated that approximately 430 hours would be required to manage the workload. In 2017, the county entered into a second program contract to manage 675 acres of red pine (20 stands). It was estimated that 971 hours would be required to manage that workload.

In 2018, 889 acres of red pine, on 17 stands was included in the third program contract. Contracts with the state are based on the fiscal year and, therefore, workloads (and reimbursements) often carry over into the following calendar year.

As part of the 2016 program contract, a total of 326 hours was required to manage the designated workload. Some of that workload was completed in the spring of 2017. In 2017 and 2018, 371.5 and 33.75 hours were applied to GNA activities. To date, a total of 1,031.25 hours has been attributed towards the GNA program.

Work on the CY2018 program contract will continue in 2019. In addition, a fourth GNA program contract with the state will be developed in early 2019, for the management of red pine stands on the Washburn Ranger District. Timber sale administration was also part of the work completed in 2018. The administration of timber sale contracts will also be part of the responsibilities in 2019.

**OTHER RECREATION ACCOMPLISHMENTS (State Funded Motorized Trails)**

In July 2013, the management of the Bayfield County Trails program was assigned to the Forestry and Parks Department. The primary responsibilities revolve around the administration, oversight, coordination and grant/aid management of the state funded snowmobile and ATV trails located on county and private lands (also the grooming/maintenance of state funded snowmobile trails on federal land).

Table 27 lists the total miles per motorized trails type, managed by the Department, as well as the amount of state maintenance aids received.

**Table 27: Mileage and Funding For Trails Managed by Bayfield County<sup>1</sup>**

Trail Type	Miles	Rate/Mile	Total
Snowmobile Maintenance	437	\$300	\$131,100
ATV Summer Maintenance	86.75	\$600	\$52,050
ATV Winter Maintenance	168	\$100	\$16,800
UTV Maintenance	86.75	\$100	\$8,675
Total	778.5		\$208,625

<sup>1</sup> Designated motorized trails as part of the state funded network.

The State of Wisconsin provides annual aids for the maintenance of existing motorized trails (see Table 27) and also offers some additional funding opportunities for individual trail rehabilitation and new trail development projects. Below are some of the more noteworthy accomplishments on the state funded motorized trails systems in 2018:

- ✓ **FEMA Projects.** The 2018 season starting with another significant storm event. Major storms and subsequent flooding pounded the area in June. In August 2018, Bayfield County received a federal disaster declaration for damages incurred as part of a mid-June storm and flooding event. The Department estimated the damage to various trail and park infrastructure to be roughly \$120,000. In addition to the trail damages incurred, an old landfill, located in the Town of Delta, the property of which is now owned by Bayfield County, was also significantly impacted. Damage to the landfill was estimated to be in the ballpark of \$300,000 to \$600,000.

As per the declaration, the Department worked with FEMA throughout the remainder of 2018 to identify the projects and create final damage assessments. Trails were a high priority as most were part of the snowmobile system and would have resulted in trail closures if not repaired before winter. Clean up in the parks was also considered a high priority, as the safety of the campers was paramount (the only park that received an appreciable amount of damage was Delta Lake). A significant amount of time was spent on storm related projects in 2018.

Table 28 summarizes the various trail projects that were completed as a result of the June 2018 storm event.

**Table 28: 2018 Storm Damage Snowmobile and ATV Trail Repair Projects**

Project Name	Trail Location	Trail Type	Activity	Contract Expense	County Direct	Total Cost
Sutherland Rd.	Trail 4	Snowmobile	Bridge Reset	\$1,750.00	\$344.73	\$2,094.73
Project 1	Trail 13	Snowmobile	Bridge Reset	\$9,186.00	\$258.68	\$9,444.68
Project 2	Trail 13	Snowmobile	Trail Repair	\$21,360.00	\$517.36	\$21,877.36
Project 3	Trail 3	Snowmobile	Bridge Reset	\$4,900.00	\$301.71	\$5,201.71
Project 4	Trail 4	Snowmobile	Trail Repair	\$17,387.00	\$862.10	\$18,249.10
Project 5	Trail 63	Snowmobile	Trail Repair	\$3,214.00	\$215.66	\$3,429.66
Project 6	Trail 63	Snowmobile	Trail Repair	\$15,347.00	\$517.36	\$15,864.36
Project 7	Trail 63	Dual	Trail Repair	\$17,667.00	\$689.47	\$18,356.47
Project 8	Trail 63/Drummond Connector	Dual	Trail Repair	\$69,668.35	\$9,009.73	\$78,678.08
Cherryville Rd	Trail 13	Snowmobile	Culvert Repair	\$1,707.69	\$135.92	\$1,843.61
Flag Rd	Trail 3	Dual	Trail Repair	\$825.00	\$7,153.47	\$7,978.47
Wally Polk	Trail 40	Dual	Trail Repair	\$0.00	\$3,025.71	\$3,025.71
FEMA Direct Admin	NA		FEMA Admin	\$0.00	\$3,875.52	\$3,875.52
Total				\$163,012.04	\$26,907.42	\$189,919.46

All of the trails and the damage to the park was repaired before official FEMA funds were awarded. A determination of repairs and funding levels associated with the landfill are still ongoing. All of the trail and parks projects were completed in 2018, but reimbursement for the costs associated with repairs won't be received until 2019. Between federal reimbursement from FEMA (which is 75% of the official damage assessment), and the state of Wisconsin (which is 12.5% of the assessment), the county would be responsible for the remaining 12.5% of the costs.

However, the Department can (and will) apply for additional assistance from the DNR for the remaining costs associated with trail repairs. It is anticipated that 100% of the costs associated with repairs to the ATV and snowmobile trails will be reimbursed. The county share of repairs to the park and landfill would still be the responsibility of the county. Total cost of repairs to the park was roughly \$5,000, so the county share is relatively minor. But repairs to the landfill could reach half a million dollars.

In addition to repairs to infrastructure managed by the county, the Department also partnered with the United States Forest Service to repair a section of storm damaged trail on federal land. The goal of the partnership was to help facilitate and expediate repairs to a significant snowmobile/ATV trail located between Drummond and Grand View (locally known as the



Drummond Connector). This same section of trail was damaged as part of the 2016 storm event (where the county and USFS entered into a similar partnership to repair the damage).

The USFS engineered the plans for repair, and the Department did the rest. The total cost of repair was just under \$80,000. A portion of the funds were supplied by the USFS (\$40,000), with the remaining coming from the state through snowmobile and ATV trail aids. Total out of pocket expense to the county was zero (other than personnel time associated with contract administration), and the partnership ensured that the trail would be open in time for winter use.

- ✓ Repairs to the storm damaged trails consumed an enormous amount of time and resources in 2018, more so than all other motorized trail related tasks.
- ✓ Were awarded a state grant in 2018 to construct a covered shelter on Trail 3 (Flag Road), near the concrete vault bathroom that was installed in 2017 (also with 100% funding from a state grant). Work on the shelter is expected to commence in 2019. The grant will cover 100% of the costs.
- ✓ New winter ATV maintenance miles were approved for Trail 18 on West Delta Road (roughly 3.5 miles).
- ✓ New winter ATV maintenance miles were approved for Trail 17 South (roughly 5.7 miles), which is maintained by the Gordon snowmobile club (a Douglas County club).
- ✓ The state grant for the purchase of 5 acres in the Town of Barnes (which was completed in 2017) was closed out in 2018.
- ✓ Re-installed a washed out culvert on Trail 31 South, near Hills Mills Rd.
- ✓ Culvert repair and surface work on the trail outside of Grand View.
- ✓ Various minor surface repairs to Trail 7 in downtown Barnes.
- ✓ Removed a 40' snowmobile trail bridge on an abandoned section of Trail 2 outside of Mason. The bridge was moved to the fairgrounds for repairs to the deck. Once repaired, the bridge will be available for future use, when needed.
- ✓ Completed a minor re-route of Trail 15 on private land outside of Grand View, which also involved re-setting a 30' bridge.
- ✓ Created a temporary re-route of portions of Trail 31 South to avoid stretches that have become very wet and difficult to freeze down. If the re-route becomes permanent, additional permits will need to be obtained as there would be new stream and wetland crossings. In addition, the 40' bridge currently over the Ounce River would need to be removed and stored for future use.
- ✓ Beaver control near various bridges has become an annual activity. A few nuisance beaver were removed and dams were addressed, in a response to rising water threatening the integrity of the bridge (and use of the trail).
- ✓ Numerous re-routes of the snowmobile trail system as a result of closure on private lands. When re-routes are required, the Department works closely with the Alliance to locate suitable re-routes and collaborate with the landowners. This will continue to be a problem in the future.
- ✓ Placement of gravel on numerous sections of ATV trail. Sections are treated as needed and as reported by the clubs.

Bayfield County works with local clubs (both ATV and snowmobile) and the Snowmobile Alliances to ensure that all trails are in a safe and enjoyable riding condition. All routine or minor maintenance activities are typically accomplished by the clubs, while most major rehabilitation projects are administered by the Department.

During any given year, routine maintenance can include the posting/maintenance of signs, brushing, removal of debris, mowing, grooming, minor washout or rutting repair, grading, placement of gravel, etc.

Major rehabilitation can include significant culvert washouts, bridge repair, significant damage occurring as a result of flooding or other major storm event, etc. Addressing concerns or questions from private landowners (generally regarding trails approved for use on their property) is also a significant part of managing the motorized programs.

In addition to the state funded trails, the Forest provides numerous opportunities to recreate with a motorized vehicle. As previously stated, there is a total of just over 1,400 miles of inventoried roads and trails on the county forest. Of that total, approximately 72% are accessible with an ATV/UTV and 42% accessible with a highway vehicle. The county monitors the condition of roads and trails and performs routine maintenance on a case by case basis.

## **PARKS & CAMPGROUNDS**

In September 2010, the management of all county owned parks and campgrounds were assigned to the Forestry and Parks Department. This includes the management of three campgrounds (Twin Bear Lake, Delta Lake and Big Rock) and one day use park (Atkins Lake).

Most of the major improvements have been focused on the two largest and most popular campgrounds, Twin Bear and Delta Lake. Below is a summary of all major accomplishments, at Twin Bear and Delta Lake, since the transition (accomplishments over the past two years are labeled).

1. Twin Bear Campground
  - a. Complete electrical rebuild and upgrade throughout the entire campground.
  - b. Repair of all major outbuildings and store.
  - c. New seasonal mooring dock (2017).
  - d. New transient mooring dock, with steps (2017).
  - e. Construction of new overflow parking area (2017).
  - f. Construction of new fenced in storage area adjacent to garage (2017).
  - g. New pressure tank in the upper well (2018).
  - h. Reconstruction of the beach area.
  - i. New fishing pier near the beach area.
  - j. New ADA access ramp to the beach area.
  - k. Creation of new tent camping site.
  - l. Re-grade of the parking area to control runoff and improve drainage.
  - m. New gas hot water heaters, for each shower, in the shower building.
  - n. Installed high-speed wireless internet service throughout the entire campground.
  - o. Installed new playground equipment near the beach area.
  - p. Re-established and re-surfaced the walking path near Puig's Point.
  - q. Improved an old dock and added a new access point to the lake.
  - r. Changed out all locks to the same keyset.
  - s. Partnered with Brule River Canoe to provide canoe and kayak rentals.

- t. Trimming of hazard branches and removal of hazard trees (a little nearly every year).
  - u. Replacement of picnic tables (ongoing – a little every year).
  - v. Numerous other minor improvements throughout the campground.
2. Delta Lake Campground
- a. Complete camping pad re-grade on nearly all campsites.
  - b. New playground equipment near beach area.
  - c. Removed old access boardwalk near the playground and replaced with graveled path (2017/2018).
  - d. Minor repairs to the beach area (2017 and 2018).
  - e. New fishing pier.
  - f. Repair of all major outbuildings.
  - g. New electric added to last four remaining powerless campsites.
  - h. A small timber sale was established to remove all dead and dying hazard trees. Mostly over mature white birch and aspen.
  - i. Installed high-speed wireless internet service throughout the entire campground.
  - j. Added another mooring dock/fishing pier and small picnic area.
  - k. Installed another section on additional mooring dock.
  - l. Replaced hot water heater in the shower building.
  - m. Changed out all locks to the same keyset.
  - n. Partnered with Brule River Canoe to provide canoe and kayak rentals.
  - o. Minor maintenance on the wooden access ramp.
  - p. Re-located the fee tube due to previous theft related issues.
  - q. Replacement of picnic tables (ongoing - a little every year).
  - r. Numerous other minor improvements throughout the campground.
3. Atkins Lake Park (day use)
- a. New boat launch dock (2017).
  - b. A new primary park sign was ordered in 2018 and will be installed in 2019.
4. Big Rock Campground
- a. Removed large dead white pine near river (2018)
  - b. Removed hazard trees and branches/limbs throughout entire campground (2018).
  - c. Regraded and surfaced main parking area (2018).
  - d. Resurfaced a few camping pads (2018).
  - e. Replacement of roughly one quarter of the picnic tables (2018).
  - f. A new primary park sign was ordered in 2018 and will be installed in 2019.

In addition to the physical improvements to the parks and campsites, many logistical improvements have also been made. At both Twin Bear and Delta Lake, seasonal sites have been re-structured in a way to better capture the value potential in each campground. The reservation system for each was also adjusted to give all interested an equal chance at reserving a site.

Table 29 summarizes the total amount of occupancy at each campground from 2011 through 2018. The seasonal category represents the total number of sites that were rented for an entire camping season (generally the first weekend in May through October 31), while the day use category

represents the total number of days non-seasonal campsites were rented within each campground over the entire camping season. Total revenues received are also included (total revenues include seasonal sites, day use sites, boat launching, boat mooring, canoe rentals and other miscellaneous charges).

**Table 29: Campground Rates of Occupancy and Total Revenues (Seasonal and Transient)<sup>1</sup>**

Year	Twin Bear			Delta Lake			Big Rock			Total		
	Seasonal	Transient	Revenue	Seasonal	Transient	Revenue	Seasonal	Transient	Revenue	Seasonal	Transient	Revenue
2011	22	755	\$50,849	13	327	\$23,210	0	317	\$2,812	35	1,399	\$76,871
2012	26	632	\$56,448	18	246	\$27,998	0	327	\$3,860	44	1,205	\$88,306
2013	26	519	\$52,018	10	387	\$19,950	0	286	\$3,524	36	1,192	\$75,491
2014	28	539	\$53,822	10	388	\$19,303	0	303	\$3,733	38	1,230	\$76,858
2015	17	1,034	\$56,835	10	251	\$20,176	0	405	\$5,118	27	1,690	\$82,129
2016	18	876	\$57,401	12	298	\$25,304	0	491	\$6,209	30	1,665	\$88,914
2017	19	1,132	\$64,617	13	422	\$31,705	0	625	\$7,689	32	2,179	\$104,011
2018	19	1,010	\$64,197	15	442	\$34,639	0	581	\$7,246	34	2,033	\$106,082
Average	22	812	\$57,023	13	345	\$25,286	0	417	\$5,024	35	1,574	\$87,333

<sup>1</sup> Seasonal represents the total number of campsites rented for an entire season; Transient is a summary of the total number of days non-seasonal campsites were rented at each campground.

Twin Bear is, by far, the most popular campground managed by the Department. With 43 campsites, it's also the largest. In 2018, 19 sites were rented by the season (equal to the amount rented in 2017), while the remaining transient (or day use) sites were rented for a total of 1,010 days (a decrease 10% when compared to 2017, which was also a record year). Day use camping was down slightly when compared to 2017, but boat launch use increased (by over 27%). Which is why total revenue, despite less camping, was nearly equal when comparing 2017 and 2018.

Starting in 2015, seasonal sites located at Twin Bear were reduced in number and day-use sites were re-evaluated as an attempt to better maximize the potential use of the park. As a result, day use has increased significantly (by nearly 70% when compared to the average day use from 2012-2014) and total average revenues (2017 and 2018) have increased by nearly 21%. High-speed internet was installed in the campground in 2015.

Delta Lake contains 34 campsites, 15 of which were rented by the season in 2018, an increase of two sites when compared to 2017. All allotted seasonal sites were reserved in 2018, with the remaining transient sites rented for a total of 442 days. The number of transient rentals in 2018 continues a trend of record setting use. The average day use rentals over the past two seasons is roughly 40% higher than the average use between 2011-2016. Total revenues received in 2018 also established an all-time high at nearly \$35,000 (an increase of over 9% when compared to 2017, and nearly 65% when compared to the average prior to 2017). Seasonal sites were also modified, starting in 2013, as an attempt to maximize the use of the park. High-speed internet was also installed in the campground in 2015.

Big Rock is the smallest of the three campgrounds, with a total of 13 sites. All sites are generally considered rustic, none of which have access to power. In 2018, a total of 581 rentals occurred at Big Rock. This represented the second largest total use on record (second only to last year). Use in 2018 was a decrease of roughly 7% when compared to 2017, but an increase of nearly 65% when compared to the average use prior to 2017. A portion of the increased use may still be explained as a reaction to the major wind storm event that occurred during the summer of 2016.

The wind storm severely damaged Birch Grove campground (a popular rustic campground managed by the Forest Service, not too far, as the crow flies, from Big Rock) resulting in the closure of that park. The park remained closed in 2017, but did have a soft opening in 2018. Birch Grove also experienced a major change, as most of the mature trees were blown down or otherwise removed as a result of the 2016 storm. The campground is now very “open” and campers who would have used that campground may have chosen to camp at Big Rock. Trends will continue to be monitored to evaluate use. Improvements to Big Rock will occur in 2018.

Atkins Lake is a small day use park and contains a boat launch, picnic area, access to a small swimming area and concrete vault bathrooms. Starting in 2015, the use of the boat launch was free of charge. Overall use at this location is difficult to track. We may install counters at the entrance to the park in an attempt to determine general use patterns.

In total, when combining activity at all three campgrounds, 2018 established an all-time high for revenue and second largest amount of total use. The average total use over the past two seasons is nearly 51% high than prior to 2017 and the average total revenue since 2017 is nearly 30% higher. In addition to camping, boat launch activity (available at both Twin Bear and Delta Lake, for a fee, and Atkins Lake, for free) were at all-time highs. Day use of the playground equipment (available at Twin Bear and Delta Lake), as well as the beach (again, at Twin Bear and Delta Lake) has also significantly increased. Total use of the parks, in terms of overnight camping and day time use of the grounds, has increased dramatically over the past few years.

## **PROFESSIONAL DEVELOPMENT, REPRESENTATION AND PARTICIPATION**

Most staff members of the Department are active members, representatives or participants in various professional committees or organizations. Participation can vary from casual interactions to formal representation. Some of the more noteworthy are as follows:

1. Member of a Committee that updated the Economics chapter of the WDNR Silvicultural Handbook – Steve Probst.
2. Member of a Committee that updated the Jack Pine chapter of the WDNR Silvicultural Handbook – Andrew O’Krug.
3. Member of the WDNR Tree Marking Guidelines Ad Hoc Team – Jeremiah Neitzel.
4. WCFA representative on the Wisconsin Initiative on Climate Change Impacts, Forestry working group – Jason Holmes.
5. Member of the WNDR Natural Regeneration Ad Hoc Team – Mike Amman.
6. Forestry stakeholder representative on the Wisconsin County Deer Advisory Council (CDAC) – Mike Amman.
7. Renewed MSHA Certification – John Mesko.
8. Renewed Herbicide Applicators License – Jeremiah Neitzel.
9. Completed FAA training and obtained license to operate drones – Mike Amman, Jason Holmes, Jen Bratsch and Steve Probst.
10. Presenter(s) at one stop of the Natural Resources Board tour (in Cable) – Jason Holmes and Mike Amman. Focus of the discussion was on an overview of the Bayfield County Forest, summary of recreation in Cable, challenges associated with forest management and recreation, deer and continuous forest inventory.
11. Presenter at the WI SAF Annual Conference in Wausau – Jason Holmes. The focus of the presentation was regeneration monitoring and deer browse issues.

12. Presenter at a meeting of the Northern Area GIS User Groups – Jason Holmes. Using technology in forest data collection, as well as the use of our canopy height model when analyzing stand data.
13. Presenter at a Wisconsin Woodland Owners Association meeting in Hayward – Jason Holmes. Adapting forest to climate change.
14. Presenter at a Northern Forest Birds Workshop in Ashland – Andrew O’Krueg. Overview of the Barnes Barrens Management Area.
15. Presenter at the Wisconsin Sharp-tailed Grouse Society Annual Meeting in Red Cliff – Andrew O’Krueg. Summary of the Barnes Barrens Management Area.
16. Hosted professional tours of various forest management activities on the county forest, including, but not limited to, numerous visits to the two deer exclusions fences; the Barnes Barrens Management Area; and red oak regeneration site visits.
17. As part of professional development, all staff members attend various meetings, conferences and technical training sessions throughout the year, including those arranged and/or hosted by the WCFA, SAF, WDNR and other similar organizations.

## **MEET THE STAFF**

The information listed above describes the general Departmental accomplishments for CY 2018. Below is a brief background history of Department and DNR staff employed to accomplish those goals (that were part of the Department in CY 2018).

### Administrator: Jason Bodine.

- a. Experience: Forester with Bayfield County from 2000 to 2009. Administrator from 2009 to present.
- b. Highest Level of Education: Master of Science in Forestry from Michigan Technological University.
- c. Primary Role: administers and manages all aspects of the forestry, parks and recreation programs. Directs day to day operations and all planning efforts. Supervises all employees working within the Department.

### Assistant Administrator: Steve Probst.

- a. Experience: Forester with Bayfield County from 1999 to 2000. Assistant Administrator from 2000 to present.
- b. Highest Level of Education: Bachelor of Science in Forest Management from UW Stevens Point.
- c. Primary Role: assist the administrator in all facets of the forest management program. Provides lead field role in all aspects of timber sale administration.

### Forester: Mike Amman.

- a. Experience: Forester with Bayfield County from 2003 to present.
- b. Highest Level of Education: Bachelor of Science in Natural Resources from UW Madison.
- c. Primary Role(s): timber sale establishment, forest reconnaissance, reforestation and regeneration monitoring and database management (GIS and WisFIRS). Assist in other aspects of the forest management program.

### Forester: Andrew O’Krueg.

- a. Experience: Forester with Bayfield County from 2010 to present.
- b. Highest Level of Education: Bachelor of Science in Forest Management from UW Stevens Point.
- c. Primary Roles(s): timber sale establishment, forest reconnaissance, reforestation and

regeneration monitoring and database management (GIS and WisFIRS). Assist in other aspects of the forest management program.

Forester: Jeremiah Neitzel.

- a. Experience: Forester with Bayfield County from 2011 to present.
- b. Highest Level of Education: Bachelor of Science in Forest Management from UW Stevens Point.
- c. Primary Roles(s): timber sale establishment, forest reconnaissance, reforestation and regeneration monitoring and database management (GIS and WisFIRS). Assist in other aspects of the forest management program.

Forester: Jason Holmes.

- a. Experience: Forester with Bayfield County from 2012 to present.
- b. Highest Level of Education: Master of Science in Forestry from Michigan Technological University.
- c. Primary Roles(s): timber sale establishment, forest reconnaissance, reforestation and regeneration monitoring and database management (GIS and WisFIRS). Assist in other aspects of the forest management program.

Recreation Forester: Jenifer Bratsch.

- a. Experience: Recreation Forester with Bayfield County from 2016 to present.
- b. Highest Level of Education: Master of Science in Physical Geography from the University of Calgary.
- c. Primary Roles(s): assist in the management of state funded ATV and snowmobile programs, all recreation related activities on county forest lands, including all designated non-motorized trails and yurts, and county owned campgrounds and day use parks.

Forest Technician: John Mesko.

- a. Experience: Forest Technician with Bayfield County from 2001 to present.
- b. Highest Level of Education: employed in the general field of forest management for over 30 years.
- c. Primary Roles(s): heavy equipment operation, road and trail maintenance, repair and construction, parks maintenance, assist in the timber sale program, assist in the reforestation program.

Office Manager: Patricia Bruno.

- a. Experience: Office manager with the Forestry and Parks Department from 2011 to present. Employed in other departments within Bayfield County from 1994 to 2011.
- b. Highest Level of Education: Vocational School Certificate.
- c. Primary Roles(s): maintains accounts receivable and payable, prepares vouchers for all expenditures, manages all accounts and paperwork associated with the timber sale program, manages and prepares all financial records, statements and reports, provides customer service.

WDNR – County Forest Liaison Forester: Joseph LeBouton.

- a. Experience: WDNR - County Forest Liaison Forester from 2011 to present.
- b. Highest Level of Education: PhD candidate in the Department of Forestry at Michigan State University for five years where he studied links between forest landscape composition, white-tailed deer densities and northern hardwood forests.
- c. Primary Roles(s): coordinating the DNR's contribution to Bayfield County Forest management activities. The DNR provides the county with enough forest management assistance annually to set up 25% of the sustainable harvest, perform roughly 50% of the required forest reconnaissance updates, as well as contribute to road maintenance, forest improvement activities, prescribed fire, and wildlife habitat improvement projects.