

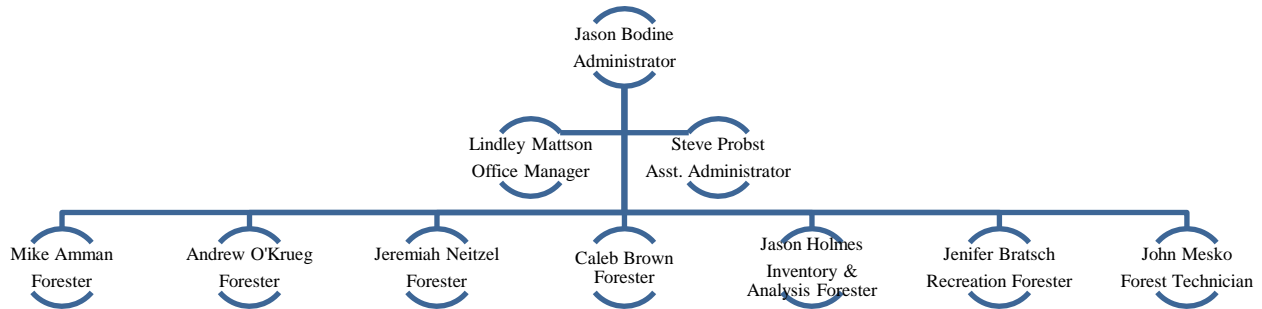
**BAYFIELD COUNTY FORESTRY AND PARKS DEPARTMENT
ANNUAL ACCOMPLISHMENT REPORT
FOR CALENDAR YEAR
2020**

FORESTRY AND PARKS COMMITTEE

Fred Strand, Chair
Jeff Silbert, Vice-Chair
Steve Sandstrom

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	32,926.85	Clover	5,386.57	Port Wing	8,876.18
Bayview	13,151.47	Hughes	24,673.01	Russell	8,490.82
Bell	15,095.03	Iron River	6,126.47	Tripp	6,539.52
Namakagon	546.80	Grand View	2,520.00	Lincoln	480.00
Washburn	80.00	Mason	40.00		

Official County Forest Acreage: 175,749.41.

The Bayfield County Forest is the third largest county forest in the state of Wisconsin. There are approximately 1,000 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 (hereafter, “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 of Supervisors (hereafter, “the Board”) in January 2006.

Starting in early 2020, the Department began the process of revising the Plan. Revisions to the Plan were addressed at nearly every Committee meeting throughout CY 2020. Final drafts of the new 15-Year Plan were approved in early 2021. The final Plan was adopted in April 2021 and will be effective through 2035. Once adopted, the new Plan will be periodically reviewed and amended, as necessary. All amendments to the Plan must be approved by the Forestry and Parks Committee (hereafter, “Committee”) and/or Board.

In addition to revisions to and maintenance of the Plan, the Committee and Board approved the Department’s 2020 annual work plan. The annual work plan gives direction and meaning to the Department’s budget, further defines and supplements the Plan, and emphasizes current goals and needs of the County Forest, Parks and Trails Programs.

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 Plan, the 2021 Budget Narrative and 2021 Annual Work Plan. All documents can be found online at:
<http://www.bayfieldcounty.org/243/Plans>.

Below are the CY 2020 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.

Forest management accomplishments can be, and oftentimes are, influenced by the factors listed above. Sustainable harvest goals (acres) are calculated and measurable targets, but are

also fairly dynamic and/or fluid in nature and, as such, are often 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 2016.

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

Species	2016		2017		2018		2019		2020		Average	
	Goal	Accomp.	Goal	Accomp.	Goal	Accomp.	Goal	Accomp.	Goal	Accomp.	Goal	Accomp.
Aspen	1,340	1,340	1,375	1,416	1,420	1,394	1,415	1,521	1,615	1,894	1,269	1,327
Nor. Hdwd.	895	870	890	809	720	586	780	820	818	788	904	849
Red Maple ¹	0	0	0	0	0	0	50	40	89	143	20	26
Red Oak	870	872	900	772	795	636	700	650	671	788	772	744
Paper Birch	30	0	30	55	25	11	25	59	0	31	72	62
Scrub Oak	255	288	215	227	255	291	210	236	235	267	195	235
Red Pine	935	906	915	912	930	850	960	1,047	1,030	1,182	931	941
Jack Pine	365	498	345	386	192	238	207	242	171	169	315	334
White Pine	90	87	90	47	80	173	75	40	108	121	89	91
Fir/Spruce	40	44	30	1	25	82	30	0	40	30	58	64
Swamp Conifer ²	140	40	140	45	100	70	75	13	60	75	107	76
Swamp Hdwd. ²	100	41	100	94	120	41	385	391	425	291	150	104
Total	5,060	4,986	5,030	4,764	4,662	4,372	4,912	5,059	5,262	5,779	4,876	4,843

¹ Timber type included in goals starting in 2019.

² Timber types included in goals starting in 2011.

Accomplishment Summary

As part of the timber sale program, a total of 5,779 acres of county forest land was sustainably managed in 2020. This represents an increase of about 14% when compared to the total accomplishments for 2019, but an increase of over 55% when compared to the average accomplishments prior to 2012.

Total sustainable harvest accomplishments were achieved at a rate of approximately 110% of the overall goal for 2020 (or roughly 10% over the goal). The overage is primarily attributed to the numerous salvage timber sales that were established as a result of a significant July 2020 windstorm.

This windstorm impacted numerous stands of younger aspen, as well as mature red oak and northern hardwoods located in the Bayfield peninsula (primarily IRMU 1). Nine (9) new salvage timber sales were established, totaling 618 acres. As of March 2021, all but two salvage sales (totaling 129 acres) were under contract.

Table 2 summarizes the total amount of acres that were included in the nine new salvage timber sales (per primary timber type).

Table 2: Storm Damaged Timber Sales (acres)

Timber Type	Acres
Aspen	329
Northern Hardwoods	143
Red Oak	121
Red Maple	20
White Birch	3
Other	2
Total	618

In addition to the nine new salvage sales, five existing timber contracts were amended to include storm damaged wood.

Notwithstanding the involuntary salvage related sales, the goal for most major timber types fell within the targeted range. Below is a summary of accomplishments for the major timber types.

- Aspen: the accomplishment rate for the aspen type was roughly 117% of the management goal (over by 279 acres). In general, the overage is primarily attributed to the increase in salvage related timber sales within IRMU 1. The harvest goal for aspen in IRMU 1 was 380 acres. The aspen accomplishment in that unit was 582 acres, with 329 of those acres were attributed to salvage sales. Some aspen stands in IRMU 1 had already been managed when the windstorm arrived (which is the main reason the accomplishment rate was well over the goal). Minor nuances associated with timber sale design and development were the other reasons for the difference.
- Northern Hardwoods: 96% of the management goal (under by 30 acres). There was a considerable amount of storm damage related impacts to the northern hardwood type in IRMU 1. However, the management of the northern hardwood type was only just beginning when the damage occurred. As a result, the Department was able to shift attentions to storm damaged sites without significantly impacting the previously established harvest goal. Minor nuances associated with timber sale design and development were the other reasons for the difference.
- Red Oak: 117% of the management goal (over by 117 acres). Similar to the aspen type, mature stands of red oak in IRMU 1 were impacted by the July windstorm. The harvest goal in IRMU 1 was 110 acres. The total accomplishment in that unit was 207 acres (with roughly 60% of the accomplishment attributed to salvage related management). Also, 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 2020 was set at 140 acres. However, it was determined that many stands were not ready for treatment.

As a result, only 35 acres of overstory removals were established (or 105 acres under goal) in 2019. Also, most red oak stands on the forest are classified as mature or overmature. As such, in general, only the higher quality stands, with appropriate levels of density, are prescribed for a thinning. The general goal is to treat as many of these stands as possible over the next 10 years. The goal for thinning was set at 146 acres in 2020. A total of 214 acres of even-aged thinnings were established (or 68 acres over the goal).

- Scrub Oak: 114% of the management goal (over by 32 acres). Scrub oak quality is generally highly variable. On average, most scrub oak stands are over mature and 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). The Department is in the process of establishing the Bass Lake Barrens Management Area (for more information on the BLBMA, see the 2021 workplan and 2021-2035 Comprehensive Land Use Plan). In general, this roughly 1,300 acre area will be converted to an open barrens landscape. As such, the harvest goal for stands located within this area have been accelerated. The goal for scrub oak in IRMU 4 was set at 45 acres in 2020. The total accomplishment in the unit was 106 acres (all located within the BLBMA). Capturing mortality and starting the regeneration process in these over mature stands, as well as an accelerated harvest in the BLBMA, are the primary reason for the difference.
- Red Pine: 115% of the management goal (over by 152 acres). When establishing a timber sale in the Barnes hardwood block (IRMU 6), it was determined that an adjacent stand of red pine was also ready for management. A harvest goal for red pine in IRMU 6 was not established in 2020. The total accomplishment in that unit was 44 acres of establishment and 53 acres of update. The 97 acres of accomplishment in Unit 6, combined with minor nuances associated with timber sale design and development, were the primary reasons for the difference.
- Jack Pine: 99% of the management goal (under by 2 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. In general, the harvest goal for the remaining stands of mature jack pine is well established over the next few years. Deviations from the planned management activities will generally only occur if there is a need to accelerate harvests due to excessive mortality, when a stand is exhibiting significant signs of decline, or to achieve a desired objective within the core area of the Barrens.
- White Pine: 112% of the management goal (over by 13 acres). The goal for white pine was 108 acres. The accomplishment was 121 acres. Minor nuances associated with timber sale design and development, were the primary reasons for the difference.
- Swamp Conifer: 125% of the management goal (over by 15 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. Since added to the dedicated harvest goals in 2011, most of the manageable swamp conifer stands have already been treated. In general, one larger stand of swamp conifer was included in a sale in IRMU 6 (71 acres). The natural size of this one stand is the primary reason for the overage.

- Swamp Hardwoods: 68% of the management goal (under by 134 acres). Starting in 2019, the harvest goal for swamp hardwood was accelerated to address the inevitable future infestations from EAB. While the goal for this type was accelerated, most of the stands with better accessibility and/or market value were established previously. The remaining stands generally contain poorer accessibility and/or merchantability. While the goal is to regenerate all of the manageable swamp hardwoods over the next few years, some stands generally won't meet minimum requirements to accommodate a commercial timber sale. As such, the harvest goal for swamp hardwoods is a generally treated as a target, with actual accomplishments highly dependent on existing conditions and whether or not the stand contains commercially viable products.
- Red Maple: 161% of the management goal (over by 54 acres). The red maple type was officially included in the harvest goals starting in 2019. A few larger stands of red maple exist, but this type is often included in other adjacent sales when an opportunity exists. A larger stand of red maple (95 acres) was included in a sale located in IRMU 6. The management goal for red maple in IRMU 6 was 45 acres. Also, 20 acres of red maple was included in various salvage sales located in IRMU 1. There wasn't a red maple harvest goal in that unit.

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.

Table 3 displays a summary of the accomplishments for the sustainable timber harvest program, from 2010 through 2020.

Table 3: Bayfield County Forest Sustainable Harvest Summary (acres)

Year	Management Goal	Timber Sale Establishment	Stand Update ^a	Total Accomplishments
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 ^b	4,645	4,313	492	4,805
2016 ^c	5,060	4,718	304	5,022
2017 ^d	5,030	4,354	465	4,819
2018 ^e	4,662	3,775	607	4,382
2019 ^f	4,912	4,608	471	5,079
2020 ^g	5,262	5,177	679	5,856
Average	4,876	4,367	497	4,864

^a Stands are updated, in part, due to inaccuracies in the data or insufficient growth for management.

^b Includes 24 acres of other forest types not inc on harvest goals table.

^c Includes 89 acres of blowdown salvage sales and 36 acres of other forest types, not inc. on harvest goals table.

^d includes 55 acres of other forest types not inc on harvest goals table.

^e includes 10 acres of other forest types not inc on harvest goals table.

^f includes 20 acres of other forest types not inc on harvest goals table.

^g includes 35 acres of other forest types not inc on harvest goals table and 618 acres of salvage sales.

In 2020 roughly 88% of the total accomplishment (acres) was in the form of a timber sale (approximately 12% was not established as a timber sale for the reasons described below). This is a little higher than the general average for stand updates from over the past ten years (which is a little over 10%).

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 4 below summarizes the general type of prescriptions applied to stands that were established as part of a timber sale.

Table 4: Summary of Management Prescriptions (acres)

Year	General Prescription Category			
	Even-Aged	All-Aged	Thinning	Total
2015	2,720	400	1,193	4,313
2016	3,185	426	1,107	4,718
2017	2,751	354	1,249	4,354
2018	2,366	312	1,097	3,775
2019	2,876	581	1,151	4,608
2020	3,206	375	1,596	5,177
Average	2,851	408	1,232	4,491

In general, when a timber sale is established a harvest goal or prescription is applied to each stand. The objective of the timber sale could emphasize developing growth and quality on trees that aren't harvested (thinning and all-aged prescriptions) or it could target ways to regenerate the new stand (even-aged and all-aged prescriptions).

Over the past six years, even-aged management treatments have been prescribed on an average of 2,851 acres; 408 acres of all-aged treatments (primarily on northern hardwood forest types) and 1,232 acres of thinning (primarily red pine and red oak forest types).

Table 5 displays a summary of the primary reasons for stand updates in CY 2020

Table 5: 2020 Stand Update Summary

Reason For Update	Acres
Incorrect Data	396
Riparian Management Zone (buffer)	194
Retention	46
Prescription Change	43
Total	679

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.

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.

Timber Sale Program: Bayfield County offers two timber sale lettings per year, one in the spring and one in the fall. On average, roughly half of the sustainable harvest goal (that has been established as a timber sale) is offered at each letting.

Table 6 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 6: 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 ^a	57	5,215	54	4,958	257	\$6,507,887	\$1,313	\$5,006,565
2016 ^{bc}	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
2019	59	5,031	52	4,267	764	\$4,163,432	\$976	\$4,171,667
2020 ^d	68	5,553	61	5,052	501	\$4,081,930	\$808	\$3,625,794
Average	54	4,224	52	4,086	138	\$3,925,042	\$940	\$3,656,901

^a Timber revenues include \$13,506.80 generated from the management of non county forest lands.

^b Includes 89 acres of blowdown salvage sales.

^c Timber revenues include \$15,393.90 generated from the management of non county forest lands.

^d Includes 9 salvage timber sales on 618 acres.

Total outputs (new timber sales) have remained relatively constant since 2011, but the timber markets have recessed considerably, especially in 2020 (primarily a result various market responses to the COVID-19 pandemic). While the total number of acres sold was at an all-time high in 2020, the bid values were at its lowest point since 2011 and timber revenues were at its lowest point since 2012 (again, a reflection of the COVID influenced decline in timber markets).

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. A similar decline was experienced in 2019.

Timber sale revenues in 2020 were roughly 13% lower than those received in 2019. In general, timber sale revenues have decreased by nearly 28% since 2017. The decline in revenue was anticipated, as stumpage prices have receded significantly over the past few years, leading to more volatile and unpredictable market conditions. But the sharp decline in 2020 was exacerbated by the COVID-19 pandemic.

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 6. Total sold bid values have decreased significantly, from a high of \$6.5 million in 2015 to nearly \$4.1 million in 2020. In addition, a total of 501 acres worth of timber sales did not sell in 2020 (many of which are sales that have been offered since 2019).

The level of unsold sales has been relatively consistent over the past three years and is primarily a reflection of poorer market conditions. Nearly all of the unsold sales are located in areas that required frozen ground conditions for most (or all) of the harvest operations. Two of the unsold sales are salvage offerings from the July 2020 windstorm.

Market demand for frozen ground only sales was very poor in 2018 and remained poor in 2019 and 2020, thus contributing to the lack of interest. Also, in 2019 the market for red pine pulp plummeted, which continued through 2020. As a result, many first thin red pine stands or those with a heavy pulp component received little or no bidding interest. This trend is expected to continue into 2021.

The \$3.626 million received in 2020 was the lowest amount of timber sale revenue since 2013. However, the past three of the past four seasons were also 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 2020 was nearly roughly 60% greater than the average amount received prior to 2012 (which was approximately \$2.3 million).

Since 2011 (when modifications to the forest management program went into full effect), the Department has averaged roughly 57 sales, covering approximately 4,600 acres, with sold timber sale bid values of roughly \$4.45 million (or about \$970/acre) and stumpage revenues of nearly \$4.20 million.

The timber sale bidding dynamics in 2019 and 2020 have also been markedly different when compared to previous offerings.

The total number of bids in 2020 was roughly 15% lower than 2019 (which was at the lowest level since 2010). The average number of bids per sale and number of different contractors placing bids also decreased considerably when compared to 2019. The total number of different contractors placing a bid was at its lowest level in over a decade.

Table 7 summarizes the timber sale bidding dynamics since 2009.

Table 7: 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
2019	59	5,031	52	4,267	220	4.2	31
2020	68	5,553	61	5,052	188	3.1	25
Average	55	4,459	53	4,230	248	4.7	35

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 (competition) 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 2020 is 5,262 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 2021 (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 (roughly \$4.7 million).

Timber Sale Contracts

In 2020, the Department awarded 61 new timber sale contracts, covering 5,052 acres, with a total bid value of \$4,081,930 (\$808/acre). Table 8 summarizes the new contracts awarded in 2020 by sale type:

Table 8: 2020 Timber Sale Contracts (per Award Type)

Type	Total	Acres	Value	Value/Acre
Traditional	52	4,402	\$3,876,927	\$880.72
Salvage ¹	7	489	\$173,910	\$355.64
Direct ²	2	161	\$31,093	\$193.12
Total	61	5,052	\$4,081,930	\$807.98

¹ 9 salvage sales were established in 2020, but 2 remain unsold.

² Sales are available for direct purchase when they receive no bids after one traditional offering.

Total timber sales awarded in 2020 increased by roughly 17% when compared to the previous year. Total acreage awarded in 2020 was the most in over a decade and primarily fueled by the additional salvage sales and the direct purchase of previously unsold offerings. The total winning bid values (per acre) decreased by roughly 20% over the same time period.

The increase in total acreage awarded in 2020 is primarily a result of the additional salvage related sales. While the decrease in value per acre is a combination of declining timber markets exacerbated by Covid-19 related impacts. Since 2016, the bid values per acre have decreased by nearly 25%. 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 2020, as well as some to be sold in the upcoming year, will be received in 2021 (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.

In 2020, as a response to the Covid-19 influenced market conditions and mill closures, the Department approved a one-time retraction of stumpage prices on timber sale contracts that

were previously extended. As per the timber sale contract, current policy is to assign a 5% increase to the original contracted winning bid/stumpage prices for the first one-year extension; then a 15% increase on the original stumpage prices for the second one-year extension; 25% on the original stumpage prices for the third extension, and so on.

Starting in late 2020 and continuing through December 31, 2021, the following adjustments to previously extended timber sale contracts will apply:

- All timber sale contracts that have been extended one or two times, where the original contracted stumpage rates were subjected to an extension price increase, will revert to the original winning bid prices (original contract rates).
- All sales that have been extended three or more times will revert to the prices of the first one-year extension (5% increase of the original winning bid prices).

Timber Sale Activity

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.

Table 9 below summarizes timber sale activity on the forest since 2009.

Table 9: Summary of Annual Timber Sale Activity¹

Year	Offered	Sold	Active²	Completed^{3,4}
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
2019	59	52	88	47
2020	68	61	95	50
Average	55	53	82	55

¹ Total number per activity per year.

² Includes active harvesting, hauling, scaling, payments, close-out activities, etc.

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

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

A total of 95 timber sales went active in 2020. Since 2012, an average of roughly 88 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.

Harvested timber sale volumes are tracked and summarized within the Department’s timber sale management system (customized Access database). When a timber sale is active, all harvested volumes are either tracked via a haul ticket or scaled in the field by Department staff.

Table 9a summarizes the amount of haul/mill tickets and field scales that were accomplished since 2015.

Table 9a: Haul Slip (Ticket) and Field Scale Entries per Year¹

Year	Tickets²	Field Scales³	Total Entries
2015	6,615	921	7,536
2016	6,938	878	7,816
2017	7,414	713	8,127
2018	7,819	833	8,652
2019	6,441	774	7,215
2020	6,457	748	7,205
Average	6,947	811	7,759

¹ Pulpwood and log volumes are processed within the Departments timber sale management system.

² Pulpwood volumes hauled from a timber sale are tracked via a ticket and associated mill slip.

³ Logs and some pulpwood are scaled on site by Department staff prior to hauling.

Nearly all pulpwood that is harvested and hauled as part of a timber sale is tracked with a ticket. The contractor fills out a ticket with the estimated volume of each load and puts a copy in a ticket box (which is located at the job site). Another copy of the ticket follows the load to the mill. The Department collects the tickets from the box and enters the estimated volume into the database. Invoices are generated based on the estimated volume. When the load is processed at the mill, a copy of the ticket and actual mill volume are sent back to the Department. The actual mill volumes are then entered into the database. When the sale is finished and the last mill slip has been entered, the contract ledger is reconciled and a final bill (or refund) is generated.

All logs are scaled in the field by Department staff. These volumes are also entered into the Department’s database and generally do not require any additional processing (no tickets are involved). On occasion, pulpwood piles are also scaled in the field by Department staff.

The information presented in Table 9a represents the total number of tickets and field scales administered during each year. Since information on each pulp ticket is entered twice (once

for the estimated volume and once for the mill volume), the actual data entry workload associated with ticket entry is twice the value listed in the table.

As of the end of CY 2020, the Department had 125 timber sales under contract, with 33 different contractors and a total contract value of nearly \$10.0 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 2021 will come from sales sold in 2021; 45% from sales sold in 2020; 20% from sales sold in 2019; 10% from sales sold in 2018 and the rest from 2017 and 2016.

Referring to Table 6, 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 through 2019.

Markets for 2020 were significantly impacted by Covid-19. This included the shut down of two significant Verso pulp mills (located in Wisconsin Rapids and Duluth, MN). At peak capacity, the Rapids mill had the potential to consume nearly 25% of all pulp products produced in the state of Wisconsin. While the Duluth mill closure had more of a direct impact on local stumpage prices, the closure of the Rapids mill had a major influence on prices across the entire region. There is some hope that, as concerns surrounding the Covid pandemic subside, market demand (and supply) will begin to recover. Assuming the poor markets will continue in 2021, the general prediction is for revenue to remain constant or slightly decrease (when compared to 2020).

Harvested Volume

Table 10 below displays the total volume of timber harvested from Bayfield County Forest timber sales from 2016 through 2020. 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 10 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 10: Timber Harvest Volume Summary (pulp in cords and logs in thousand board feet)

Species	2016		2017		2018		2019		2020		Average	
	Pulp	Logs	Pulp	Logs	Pulp	Logs	Pulp	Logs	Pulp	Logs	Pulp	Logs
Aspen	19,295	0	26,749	0	29,704	0	26,170	0	20,419	0	24,467	0
Mx. Hardwood ¹	26,513	655	19,355	568	20,474	482	21,913	597	20,024	534	21,656	567
Oak	14,262	2,814	14,087	2,027	14,101	2,274	11,316	2,042	9,120	2,852	12,577	2,402
Paper Birch	702	25	320	11	718	33	285	25	103	1	426	19
Basswood	2,087	302	1,252	232	720	111	957	211	727	164	1,149	204
Red Pine	11,921	0	9,720	0	9,376	0	7,585	0	11,115	0	9,943	0
Jack Pine	5,342	0	9,095	0	5,334	0	4,573	0	3,228	0	5,514	0
White Pine	848	0	1,558	0	465	0	276	0	141	0	658	0
Other Conifer ²	1,402	0	3,078	0	6,369	0	4,138	0	2,659	0	3,529	0
Total	82,372	3,796	85,214	2,838	87,261	2,900	77,213	2,875	67,536	3,551	79,919	3,192
Total Cord Equiv. ³	90,723		91,458		93,641		83,537		75,348		86,941	
Revenue	\$5,057,393		\$5,009,892		\$4,562,243		\$4,171,667		\$3,625,794		\$4,485,398	

¹ Sugar Maple, Red Maple, Yellow Birch, Black Ash, White Ash.

² White Spruce, Black Spruce, Balsam Fir, Tamarack, Mixed Conifer.

³ Log volumes converted to cords and added to the pulp volume.

In 2020 a little over 67,000 cords and 3,550 MBF was harvested from the county forest. While the pulp volume decreased by roughly 14% when compared to 2019, the log volume increased by nearly 24%. This may be best explained by the Covid influenced market dynamics. Mixed hardwood and pine pulp prices have decreased substantially over the past year, while oak log prices have generally remained stable. Contractors typically prioritize the timber sales that are most marketable, but that point was even more pronounced in 2020.

Aspen comprises the largest volume of wood harvested from the forest. The amount of aspen volume harvested in 2020 was 20,419 cords or about 23% lower than 2019 and much lower than the 5 year average. However, in general, the volume of aspen harvested from the forest has steadily increased over the past decade (averaging roughly 14,500 cords prior to 2013). The increase in harvested aspen volume is directly related to the steady, but gradual increase in the sustainable harvest goal for aspen.

The mixed hardwood cordwood volume harvested in 2020 decreased by about 9% when compared to 2019, but is still generally on par with the average removals over the past four years. Mixed hardwood log volumes also decreased by roughly 10% over the same time period.

The total volume of red oak pulp harvested in 2020 continued a relatively significant downward trend that started in 2019. The total amount of red oak pulp harvested in 2020 was roughly 19% less than 2019 and a little over 35% less than 2018. Poor oak pulp

markets are the primary reason for the decrease in volume. However, the volume of oak logs harvested in 2020 increased by nearly 40%. The 2,852 MBF cut in 2020 is the largest volume of oak logs harvested to date. Red oak continues to be the dominant species when analyzing total log volume harvested during any period of time. Roughly 80% of the total log volume harvested in 2020 was from red oak.

Harvested red pine volume increased in 2020. A total of over 11,000 cords was harvested in 2020. This represented an increase of nearly 47% when compared to 2019. Despite the relatively poor red pine pulp markets, many sales harvested in 2020 contained significant runs of bolts and poles. As previously stated, markets have generally receded over the past few years, and softwood pulp markets have been one of the most volatile. Sustainable harvest goals for red pine are projected to be fairly constant, but poor markets will continue to have a significant influence on the total value and volume of softwood harvested.

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 5,300 cords. However, as the Barnes Barrens Management Area begins to take shape, most of the mature jack pine stands in that unit have been managed. As a result, the amount of jack pine harvested has steadily declined over the past few years. The 3,228 cords harvested in 2020 was the lowest volume of jack pine in over a decade. The volume harvested in 2020 was nearly 30% less than 2019 and nearly 65% less than 2017. As less acreage of jack pine is managed over the next few years, the amount of harvested volume is expected to continue on a downward trend.

Table 10a 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.

Table 10a: Total Volume of Wood Harvested (2011-2020)

Year	Pulp (cords)	Logs (Mbf)	Cord Equivalents*
2011	61,139	1,597	64,653
2012	54,543	1,341	57,493
2013	81,024	1,939	85,291
2014	93,321	3,084	100,107
2015	83,023	3,042	89,715
2016	82,372	3,796	90,723
2017	85,214	2,838	91,458
2018	87,261	2,900	93,641
2019	77,213	2,875	83,537
2020	67,536	3,551	75,349
Average	77,265	2,696	83,197
5 Yr Avg	79,919	3,192	86,942
3 Yr Avg	77,336	3,109	84,176

* Converting Mbf to cords and combining pulp and log values.

Total cord equivalents in 2020 was 75,348, which was about 11% less than 2019 and the lowest overall total since 2012 (which was roughly 57,500 cords). The average cord equivalents since 2016 is nearly 87,000 cords per year. Prior to 2013, the average was about 61,000 cords, an increase of about 43%.

- 2) **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 11 displays the summary of the reforestation program.

Table 11: Bayfield County Forest Reforestation Program Summary (acres)

Year	Planting				Seeding	Site Preparation				Maintenance				Monitoring
	Red Pine	Jack Pine	White Pine	Other ¹	Jack Pine ³	Trench	Fire Plow	Scarify	Spray	Fire	Spray	Bud Cap	TST ²	Regen
2008	378	207	24	0	0	796	88	0	442	0	0	0	0	1,683
2009	487	415	0	0	0	726	72	0	348	40	0	0	0	2,652
2010	367	196	0	0	0	363	118	0	420	42	305	0	0	2,183
2011	319	153	35	68	0	900	88	0	186	21	324	0	0	1,424
2012	295	107	274	0	0	0	177	120	727	32	609	0	0	2,736
2013	281	174	92	0	558	264	0	40	0	0	449	239	0	2,522
2014	0	0	0	0	0	503	20	115	264	0	273	239	0	2,929
2015	62	0	129	0	202	717	0	99	634	0	0	239	1	2,337
2016	203	39	0	0	393	570	0	102	492	0	0	239	0	2,580
2017	36	2	0	0	460	279	0	115	585	0	0	71	46	2,931
2018	134	0	0	0	563	257	0	154	296	0	0	38	0	5,408
2019	92	0	3	0	216	305	10	112	323	0	0	8	0	5,834
2020	104	0	0	0	497	355	26	165	277	0	0	0	0	4,010
Avg.	212	99	43	5	222	464	46	79	384	10	151	83	4	3,018

¹ In 2011, tamarack and white spruce.

² Timber Stand Improvement - Hand release of established regeneration

³ Includes 110 acres of white pine in 2020.

- a) **Planting:** a total of 104 acres, on three different sites, were planted in 2020. This represents an increase of about 13% when compared to 2019. Two sites, covering 42 acres were planted at a rate of about 800 red pine seedlings per acre. While a third site, covering 62 acres, was re-planted at a rate of 600 seedlings per acre. All seedlings were 2-0 containerized stock and planted by contracted crews. A total of roughly 70,800 seedlings were planted in 2020.

An Arbor Day grant in the amount of \$5,202 was awarded in 2020. This grant was used to help offset the costs associated with planting roughly 34,000 trees.

The artificial reforestation program has experienced some transformations over the past decade, 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 497 acres were seeded in 2020. This was a significant increase when compared to 2019. A total of 387 acres were seeded with jack pine (on 7 different sites), while 110 acres was seeded with white pine (on 1 site). The jack pine sites were all seeded at a rate of about 3 ounces per acre (with local seed purchased from the WDNR nursery). A total of roughly 73 pounds of jack pine seed were applied in 2020. The white pine site was seeded at a rate of about 4 ounces per acre. A total of roughly 28 pounds of white pine seed was applied in 2020.

The jack pine seeding rate was reduced from 4 ounces per acre applied during one year, to 3 ounces per acre applied during two consecutive years. The primary goal of the change is to increase the probability of a achieving a fully stocked stand of jack pine. The white pine seed was applied to a stand that was recently harvested (where aspen and scrub oak will regenerate naturally). The primary goal of seeding in this stand is to increase diversity on a site that currently contains only a minor conifer component.

All seed applications are performed aurally, via a contract with the DNR. All jack pine 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 355 acres were power trenched (for artificial reforestation), 165 acres were scarified with a dozer and straight blade (for natural regeneration) and 26 acres were prepped, by the DNR, with a fireplow. In addition, a total of 277 acres were treated with chemicals to reduce potential competition for undesirable vegetation. A total of 823 acres were prepared in 2020. This was an increase of roughly 10% when compared to the total acres prepped in 2019 (750 acres).

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 2020, 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. However, 228 acres located with the core of the Barnes Barrens Management Area (BBMA) was treated with herbicide to facilitate the development of barrens habitat.

A total of 0 acres of young jack pine plantations were treated with terminal bud caps to deter browsing from white tailed deer. This marks the first time since 2012 that bud capping was not required.

Previously, all bud 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. But, since 2013, the Department has seeded far more acres of jack pine than planted. Until recently, seeded sites have not exhibited the same level of browse pressure and, as such, were not expected to require additional measures of protection. However, recent seedling counts have indicated extremely high levels of browsing on numerous seeded jack pine sites. Bud capping will most likely be required on many of these seeded sites in the future. 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 2019. 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 11 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 12 summarizes the general management or reforestation goals for every completed (closed out) sale from 2011 through 2020 (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 12: Summary of Treatments and Reforestation Activities on Completed Timber Sales (acres)

Year	Natural Reforestation ¹	Artificial Reforestation ²	Thinnings ³	Total Completed Sales	Total New Sales Sold
2011	1,889	1,135	619	3,643	4,156
2012	1,528	824	824	3,176	4,782
2013	1,215	830	866	2,912	4,177
2014	3,032	1,113	1,075	5,219	4,388
2015	3,127	1,053	586	4,766	4,958
2016	1,570	830	492	2,892	4,750
2017	2,176	1,044	872	4,092	4,101
2018	2,493	1,183	571	4,247	3,813
2019	2,144	455	723	3,322	4,267
2020	2,399	567	671	3,637	5,052
Average	2,157	903	730	3,791	4,444

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

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

³ 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 12, 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 3,791 acres since 2011), a vast majority are prescribed to regenerate naturally, with an average of 2,157 acres per year (or nearly 57%). An average of 903 acres are prescribed for artificial reforestation (approximately 24%) and 730 acres are treated with even-aged thinnings or intermediate treatments (approximately 19%). Red pine and red oak are the two most prominent timber types that receive even-aged thinnings (or intermediate treatments).

- 3) **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.

At nearly 176,000 total acres, a complete re-inventory of the county forest 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 did occur in CY 2019).

Table 13 displays the summary of compartment/stand updates from 2010 through 2020.

Table 13: Compartment Inventory Summary (acres)

Year	Number of Compartments	Accomplishment
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
2019	0	0
2020	13	12,172
Average	9	7,665

The re-inventory cycle was started again in 2020. A total of 13 compartments and 12,172 acres were inventoried in 2020. This was the highest level of compartment inventory in over a decade. The long-term goal is to re-inventory the county forest over the next 15 years.

- b) Stand Level Inventory. In addition to compartment level inventories, the Department occasionally targets updated stand level 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 14 summarizes primary forest type inventory efforts since 2014.

Table 14: Primary Forest Type (Stand Level) Inventory Summary (acres)

Year	Jack Pine	Red Pine	Red Oak	Northern Hardwood	Swamp Hardwood	Aspen	Other	Total
2014	2,002	0	3,260	0	0	0	0	5,262
2015	0	0	5,423	2,187	0	0	0	7,610
2016	0	0	439	843	0	0	0	1,282
2017	0	0	0	4,269	104	0	0	4,373
2018	0	0	0	2,462	1,392	0	0	3,854
2019	0	721	0	0	0	4,975	0	5,696
2020	705	15	0	124	92	0	81	1,017
Total	2,707	736	9,122	9,885	1,588	4,975	81	29,094

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.

In 2019, the focus shifted to stands of aspen and red pine. Aspen stands were selected due to concerns with the potential presence of hypoxylon, which can lead to mortality and poor growth. Through a GIS analysis using a canopy height model developed internally with LiDAR info, the Department was able to locate stands that were potentially underperforming (or developing well below standard growth charts). The presence of hypoxylon was noted on a few stands during previous examinations. A total of 4,975 acres were inventoried. Fortunately, none of these stands contained excessive levels of hypoxylon and were just developing on poorer quality sites.

Also in 2019, 721 acres of red pine was inventoried in Zone 4 of the Barnes Barrens. These stands were targeted to help develop the final harvest strategies in that Zone. Updated stand information will help the Department determine which stands to prioritize first as some of the last mature red pine is converted to jack pine in the Zone.

In 2020, a total of 1,017 acres of stand level inventory was accomplished. The primary emphasis was jack pine stands located in the Barnes Barrens Management Area (BBMA). Mature stands were re-analyzed for mortality and subsequent timing of future harvest. Other stands of jack pine in the BBMA were evaluated to determine the appropriate timing for harvest within each Zone. Additional stands of northern hardwood and swamp hardwood were also addressed in 2020.

- 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 15 summarizes the artificial reforestation monitoring results since 2015.

Table 15: Artificial Reforestation Monitoring Summary (acres)

Species	2015		2016		2017		2018		2019		2020	
	Seeded	Planted	Seeded	Planted	Seeded	Planted	Seeded	Planted	Seeded	Planted	Seeded	Planted
Jack Pine	0	477	0	535	558	145	326	202	446	202	394	202
Red Pine	0	883	0	760	0	638	0	876	0	891	0	667
White Pine	0	112	0	16	0	49	0	0	0	0	0	0
Other	0	0	0	108	0	0	0	0	0	0	0	0
Total	0	1,472	0	1,419	558	832	326	1,078	446	1,093	394	869
Grand Total	1,472		1,419		1,390		1,404		1,539		1,263	

In 2020, a total of 1,263 acres of planted and seeded sites were monitored. This represents a decrease of about 18% compared to the total number of acres monitored in 2019. 394 acres of seeded jack pine sites were monitored, while 202 acres of planted jack pine and 667 acres of planted red pine were also surveyed.

In general, monitoring results show that red pine stands are progressing as expected. Jack pine seeded sites are generally still too young to quantify, but appear to be progressing as expected. However, as previously stated, some seeded sites are now starting to exhibit significant levels of deer browse. In general, stocking on seeded sites is a little lower and much more variable when compared to planted stands.

If browse pressure continues at current levels, many of these seeded stands will be considered a failure and will need to be reforested (again). If a jack pine seeded site is determined to be a failure, re-planting will most likely be the preferred next step. Jack pine or red pine will stock (containerized) will be planted in sites that are considered a failure (jack pine will be preferred within the designated barrens areas).

- 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 14 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 16 summarizes the total amount of natural regeneration monitoring (acres) that has occurred on the Bayfield County Forest since 2012.

Table 16: Natural Regeneration Monitoring Summary (FRM)¹

Year	Northern Hardwood	Red Maple	Red Oak	Scrub Oak	Aspen	Swamp Hardwood	Swamp Conifer	Other	Total
2012	27	0	417	0	0	0	0	0	444
2013	102	0	272	0	0	0	0	0	374
2014	0	0	0	0	0	0	0	0	0
2015	92	0	190	0	0	0	0	0	282
2016	352	0	618	0	0	0	0	0	970
2017	563	0	675	0	0	0	0	0	1,238
2018	1,381	0	846	0	799	23	5	0	3,054
2019	1,364	534	1,118	56	1,224	0	0	0	4,296
2020	1,652	0	1,065	0	0	0	0	30	2,747
Average	615	59	578	6	225	3	1	3	1,489

¹ 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 2021 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 priorities were targeting 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 was to incorporate FRM on all stands that will be regenerating naturally after management, as time allows. Monitoring parameters and protocols are still in the process of development and will be fine tuned as more information is collected.

In 2020, a total of 2,747 acres of naturally regenerating stands were monitored for success. This represents a significant decrease when compared to the total amount monitored in 2019. Time constraints were the primary reasons for the decrease in accomplishments, as the salvage sales absorbed a significant amount of resources. When time is a limiting factor, lower priority stands like aspen are generally the first types to be removed from the inventory list.

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. Many stands of red oak and 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 yielded mixed results.

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.

- 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 2021 Bayfield County Forest Annual Work Plan.

Table 17 displays the total number of CFI plots established since 2018 (by primary timber type).

Table 17: CFI Plot Establishment per Timber Type

Primary Timber Type	2018	2019	2020	Total
Aspen	31	78	86	195
Northern Hardwoods	14	18	15	47
Red Pine	14	10	19	43
Jack Pine	14	13	10	37
Red Oak	10	8	13	31
Scrub Oak	2	4	4	10
Swamp Hardwoods	2	2	4	8
Kegs/Water	0	3	5	8
Grasses	5	1	2	8
Lowland Brush	2	2	2	6
Red Maple	2	2	1	5
Swamp Conifer	0	4	1	5
White Pine	1	1	3	5
Right of Way	1	0	1	2
White Birch	1	1	0	2
Fir/Spruce	0	0	2	2
Other	0	0	1	1
Total CFI Plots	99	147	169	415

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, 147 in 2019 and 169 in 2020. A total of 415 CFI plots have been established over the first three years of the program. The goal is to complete roughly 125 per year over the next two years (2021 and 2022). Starting at year six (2023), the data collection process will be repeated, with the goal of complete re-inventory every five years. Also, the process of data analysis will began in CY 2019 and continued through 2020, with assistance from the Wisconsin DNR.

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 roughly 43,602 acres were inventoried/examined as part of the CFI program in 2020.

- 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 18 summarizes the total amount of acres that are analyzed by the Department per year, from 2012 through 2020.

Table 18: Summary of Principal Activities Occuring on the Bayfield County Forest (acres)¹

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
2019	4,608	3,322	0	6,167	1,539	4,296	1,069	21,001
2020	5,177	3,637	12,172	1,696	1,263	2,747	1,424	28,116
Average	4,465	3,807	6,496	3,748	1,732	1,489	1,722	23,460

¹ Primary activities/goals that are tracked per year.

In 2020, a total of 28,116 acres were managed by the Department (or about 16% of the total amount of county forest land). This is the highest total to date and represents an increase of about 34% compared to 2019.

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 (43,602 acres), the total amount of monitoring

in 2020 would be nearly 72,000 acres (or roughly 41% of the total amount of county forest land).

Barrens Management Areas

The Barnes Barrens Management Area (BBMA) 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. Development of the Bass Lake Barrens Management Area (BLBMA) began in 2020.

Among other things, the Barrens Management plan defines operational parameters and guidelines that must be followed to achieve the desired future conditions. Please review the 15-Year Comprehensive Land Use Plan and 2021 Annual Work Plan for more detailed information on barrens management.

Below is a list of the primary accomplishments within the BBMA 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/prepare for the scheduled future harvest cycles within each zone.
- Began the conversion of red pine stands in Zone 4 to jack pine to prepare for the scheduled future harvest cycles in that Zone.
- Currently, approximately 3.5 miles of the core road has been completed. Most of the core road was constructed in 2019, but the final grading and shaping was completed in 2020.
- Knapweed has been treated along heavily infested roads since 2013 (see Invasive Species section below for more information). As a result, the total amount of knapweed has been reduced significantly.
- As per the Barrens plan, all reforestation efforts focus on jack pine. Each year, sites are either trenched, site prep sprayed, or aerial seeded with jack pine.
- In 2020, the Department completed the fourth year of monitoring permanent vegetation plots, located within the BBMA, to study the effects of various chemical mixtures on the development of native plants.
- To date, roughly 75% of the core area has been established as open barrens (the core area is roughly 1,000 acres in size).
- 472 acres (or nearly 50%) of the core area has been treated with at least one prescribed burn.
- In 2020, 426 acres of the core area were roller chopped (mechanical site preparation) to reduce vertical structure and improve habitat. This project was 100% funded with supplemental Pittman-Robertson (PR) Wildlife Habitat dollars from the DNR.
- In 2020, 228 acres were treated with herbicide to facilitate the development of the core area.
- Established a wildlife project that will focus on monitoring birds within the barrens. The Department will partner with Natural Resources Research Institute (NRRI), University of Minnesota-Duluth in the development of a sharp-tailed grouse (STG), as well as breeding bird monitoring projects. The STG project will focus on tagging birds with tracking devices to monitor movements within barrens habitats. While NRRI is contracted to design and administer the study, the Department will also be partnering with the DNR and USFS on this project. The breeding bird survey will focus on collecting nesting information on

representative stands within the BBMA. The goal of both projects is to develop a better understanding of habitat use. Information collected will be used to fine-tune future barrens management strategies. DNR wildlife habitat funds will be used to fund a portion of these projects. NRRI has secured numerous other funds that will be used to address more than half of the total costs.

- Both projects are expected to begin in the spring of 2021.

Below is a list of primary accomplishments with the BLBMA (starting in 2020):

- Completed numerous timber sales required to begin the development of the BLBMA.
- Established more timber sales to continue development.
- Collaborated with the DNR regarding the best placement for a system/fire management road. The roads will be constructed within the next few years and serve as primary access to the BLBMA.
- Roller chopped (mechanical site preparation) 40 acres to reduce vertical structure and facilitate the development of the BLBMA. This project was 100% funded with supplemental Pittman-Robertson (PR) Wildlife Habitat dollars from the DNR.

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 19 describes the summary of invasive species treatments on the county forest from 2013-2020.

Table 19: Invasive Species Treatment Summary

Year	Road R.O.W. (mi)¹	Hand Treatment (ac)²
2013	0	9
2014	50	15
2015	48.5	13.5
2016	48.5	11.5
2017	52.5	24
2018	42	51
2019	42	13
2020	50	30
Average	42	21

¹ Spotted knapweed treatment in the Barnes Barrens area.

² Primarily small isolated patches of buckthorn and black locust.

In 2020, approximately 30 acres were hand treated, primarily by Department staff. Of that total, 15 acres were treated to manage multiflora rose, 8 acres were treated to manage buckthorn, and 4 acres to manage black locust. An additional 3 acres were treated by a contractor to address a small infestation of wild parsnip. 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 and multiflora rose infestations are generally isolated and fairly widely distributed on any given acre (in other words, the acres treated in 2020 were not blanketed with a sea of targeted invasive species). However, additional outbreaks are 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.

Starting 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 50 miles were treated in the BBMA in 2020. While the total number of miles treated has remained relatively consistent, the amount of chemical required to address spotted knapweed has declined by over 50% (8.5 gallons in 2015 to 4.0 gallons in 2020). The cost per mile has also decreased significantly during that same timespan (from \$750/mile in 2015 to \$200/mile in 2020).

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 and/or there may be an opportunity to alternate treatment years. 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 2020 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.

Table 20 below summarizes oak wilt treatments since 2018.

Table 20: Summary of Oak Wilt Treatments

Year	Total Trees	Total Sites
2018	30	2
2019	108	6
2020	0	0
Total	138	8

In 2018, a total of 30 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).

In 2019, 108 trees were treated on six different sites, representing a significant increase in oak wilt management when compared to 2018. A few infected trees that were treated in 2019, will be felled and bucked and then either burned or tarped in the spring of 2020.

Covid-19 impacted previously scheduled monitoring efforts as the DNR was unable to fly this area for new outbreaks. However, the Department performed a few routine drone flights in the Cable block (near previously identified outbreaks) and did not locate new infestations. While no new infected trees were treated on county forest land, Department staff did assist an adjacent industrial landowner with the treatment of two trees confirmed to have oak wilt.

Emerald Ash Borer. Emerald ash borer (EAB) was discovered in Douglas County and, most recently, in Sawyer County, our neighbors to the west and south. As a result, those counties have been quarantined, meaning, in general, there restrictions on the movement of wood. To date, EAB has not been discovered in Bayfield County. However, based on current locations, discovery in Bayfield County is inevitable. In general, ash contributes less than 0.5% of annual stumpage revenues and is present, as a dominant forest type, on less than 1.0% of the county forest.

The large purple traps often seen along major roadways, intended to help monitor for and locate the presence of EAB, are no longer being administered by DATCP or APHIS.

In 2019 and again in 2020, numerous purple traps were installed by the Department at various locations on the county forest where ash is a significant component. To date, all traps have been negative for EAB. The Department will continue monitoring for EAB in 2021.

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.

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.

Table 21 summarizes all County Forest Law (CFL) entries (acquisitions) and withdrawals (divestments) from 2004-2020.

Table 21: County Forest Law (CFL) Entries and Withdrawals

Year	Entries¹	Withdrawals²	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
2019	3,731.25	0.10	3,731.15
2020	30.00	217.00	-187.00
Total	7,481.05	603.22	6,877.83
Average	440.06	35.48	404.58

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

² Land removed from the county forest, typically via sale or trade.

Since 2015, the Department has made a few significant land transactions. In December 2014, the Department received preliminary 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).

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. The county was awarded a Stewardship grant in the amount of \$485,775 to help purchase this property. To cover

the applicant's share of the project costs, the county contributed the appraised value of 181.25 acres of county owned land (which was included in the Stewardship grant) 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 was added to County Forest Law in 2019.

In 2020, another 217 acre parcel was sold to Red Cliff (for \$315,000). Proceeds from this sale will be held in a non-lapsing land acquisition account and invested in land that will be enrolled in CFL. Also in 2020, a 30 acre parcel was purchased (for \$15,000) with partial funding from DNR snowmobile trail aids. This property contains a quarter mile of designated snowmobile trail and roughly half of an existing snowmobile trail bridge. The 30 acre property was also enrolled in CFL.

In late 2020, Bayfield County and Red Cliff identified another roughly 348 acre parcel and are currently in the process developing a similar land transaction. If approved, the proceeds of this sale (roughly \$522,000) would be combined with funds received in 2020 and applied towards the purchase of replacement lands. As such, the Department is currently working with the Trust for Public Land (TPL) on a large 2,000 acre acquisition project that would, in part, replace the lands sold to Red Cliff. If the acquisition project is approved, it is expected to be completed in late 2021.

ROADS AND RECREATION (on the County Forest)

The Forestry and Parks Department maintains nearly 1,300 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 \$351/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 2020. 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 32 miles of primary road right of way was mowed in 2020. Routine grading of the Flag Road also occurred in 2020. Numerous other roads also incurred some minor routine maintenance in 2020.

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. Of the 30 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 and also remove the cap. A total of \$90,000 was made available in 2020.

Table 22 summarizes the total Town Road Aid Program in 2020.

Table 22: 2020 Town Road Aids Award Summary

Town	Project Location (Road)	Funding Amount
Bayfield	Multiple Roads	\$12,000.00
Barnes	Multiple Roads	\$12,000.00
Tripp	Battle Axe Rd.	\$10,000.00
Bayview	Smith Fire Ln.	\$5,150.00
Bell	Klemik Rd.	\$5,200.00
Hughes	Multiple Sand Roads	\$9,000.00
Orienta	Sorenson Rd.	\$4,750.00
Highland	Motts Rd.	\$4,500.00
Iron River	Jackman Lake Rd.	\$10,000.00
Clover	Campbell Rd.	\$5,750.00
Port Wing	Hjalmer Rd.	\$3,750.00
Russell	Emil Rd.	\$5,400.00
Cable	NA	\$0.00
Namakagon	Old Grade Rd.	\$2,500.00
Total		\$90,000.00

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 2020 included: \$12,000 each for the Towns of Barnes and Bayfield; \$10,000 each for the Towns of Tripp and Iron River and \$9,000 for the Town of Hughes. The average award amount was nearly \$7,000. 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).

The 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 23 displays the total amount of revenue distributed or awarded to the Townships as a result of containing county forest lands.

Table 23: Total Annual Payments to Townships

Year	10% Timber Sales	Town Road Aids¹	DNR PILT²	Total
2010	\$204,766	\$13,573	\$51,434	\$269,773
2011	\$247,707	\$29,326	\$51,434	\$328,467
2012	\$269,676	\$21,132	\$51,434	\$342,241
2013	\$390,410	\$28,264	\$51,434	\$470,108
2014	\$453,483	\$80,201	\$51,434	\$585,118
2015	\$499,306	\$72,837	\$51,434	\$623,577
2016	\$504,200	\$85,267	\$51,598	\$641,065
2017	\$500,990	\$67,034	\$51,598	\$619,622
2018	\$456,224	\$81,700	\$51,598	\$589,522
2019	\$417,166	\$71,500	\$52,725	\$541,391
2020	\$362,579	\$85,750	\$52,725	\$501,054
Avg.	\$383,459	\$58,049	\$51,798	\$493,305

¹ Town Road Aids increased in 2014 and 2020.

² Payment made by the DNR based on \$0.30 per acre of county forest land in each Township

In 2020, the total 10% stumpage revenue sharing payment from the county was \$362,579. This represented a decrease of roughly 13% when compared to the amount distributed in 2019. 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 just over \$501,000 was awarded to the Townships in 2020.

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.

Recreational events have traditionally been a big 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.

However, nearly every event that has traditionally occurred on county forest land was cancelled in 2020, primarily as a response to Covid-19. A few of the early winter events were held as per normal, but nearly all events from March 2020 through the end of the year were cancelled.

Table 24 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 24: Summary of Approved Events

Type of Event	Number of Events per Year					
	2015	2016	2017	2018	2019	2020
Mountain Biking	7	7	6	8	7	0
Cross Country Skiing	6	5	7	9	9	4
Running	3	4	4	3	3	0
Dog Sledding	1	1	1	1	2	2
Orienteering	1	0	1	1	1	0
Other ¹	0	0	0	0	2	1
Total	18	17	19	22	24	7

¹ Includes snowshoeing and ski-joring events.

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 over 20 organized events on county forest land in 2020, but most were cancelled due to Covid-19. Mountain biking and cross-country skiing are generally 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 25 displays the approximate miles of designated roads and trails currently located within county forest boundaries.

**Table 25: Summary of Designated Roads and Trails
on Bayfield County Forest Land (miles)**

Road or Trail Type	Total Miles
Primary Road	38
Secondary Road	1,239
Road & Trail ¹	56
Unclassified Road	0
Snowmobile Trails ²	108
ATV Trails ²	42
Cross Country Ski Trails	42
Mountain Bike Trails	41
Hiking Trails	17
Dog Sled Trails	70

¹ Where a designated trail is located on a secondary road.

² 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 1,300 miles of roads and trails on the county forest, approximately 44% can be traveled with a licensed highway vehicle, roughly 73% with an off-highway vehicle (i.e. ATV,UTV) and over 90% 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 three rustic yurts. At nearly 176,000 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 23 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 2020.

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 2020, a more miles of trail were also

groomed for fat bike use. Maintenance work and minor trail improvements occurred in 2020.

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 Ski Foundation (ABSF) 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 Prince Haakon and Birkie tour ski events are all held on county forest land. The ABSF also hosts other events, including various running events and the Fat Tire Birkie (see above).

- Mt. Ashwabay Area. In the northern portion of the Forest, the Ashwabay Outdoor Recreation Foundation (AOEF) and Bayfield Nordic 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.

In 2018/2019, 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).

In 2020, the Department worked with AOEF to improve sections of the Ashwabay trail system (Deer Path). This involved regraded and re-aligning sections of existing trail and installing culverts to facilitate better drainage at two separate locations.

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.

In 2020, the Department worked with CAMBA to expand the parking area/trailhead at the Whiting Road location. This included widening and the addition of material. The Department also worked with SPARK (Student Pathways to Adventure, Resilience and Knowledge) on the installation of a porta-potty at this same location. Emergency access sites were also created, with new gates, at this same location.

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 26 summarizes the total amount of trail uses originating from each trail head location.

**Table 26: Trail Counter Summary - CAMBA Trails
Mt. Ashwabay Location¹**

Year	Ski Hill Rd. Access	Whiting Rd. Access	Total
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
2019	2,570	3,211	5,781
2020	3,506	4,462	7,968
Avg.	3,491	1,795	5,286

¹ 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 26, use of the CAMBA trails at Mt. Ashwabay has increased steadily since 2015, especially with the addition of the second trail head.

In 2020, a record number of individual uses occurred at each trailhead location. Over 3,500 individual uses was logged from the Ski Hill Rd trailhead (a roughly 36% increase when compared to 2019) and nearly 4,500 individual uses was logged from the Whiting Rd trailhead (a roughly 39% increase). In total, nearly 8,000 individual uses were captured

from both trailheads at the Ashwabay location, which is an increase of nearly 38% when compared to 2019 and nearly 67% when compared to 2017!

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. The NCT association also maintains two rustic campsites on county forest land near the trail. One campsite is located near Erick Lake and the other is located near Morris Pond.
- Jerry Jolly Trails. Some additional work was accomplished on the Jolly trails in 2019. A broken timber mat, used on the trail to cross a minor wet area, was repaired in 2019 (using salvaged timbers that were removed from the docks in the City of Bayfield). Some additional 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 were accomplished in 2020.
- Lost Creek Falls Trail. Upgrades to the Lost Creek Falls trail began in 2015. Accomplishments over the past five 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 27 summarizes the total use of the Lost Creek Falls trail, from the Trail Dr. trail head location, since 2016.

Table 27: Trail Counter Summary
Lost Creek Falls¹

Year	Number of Users
2016	6,327
2017	7,193
2018	5,468
2019	5,105
2020	14,648
Avg	7,748

¹ Number of individual users from Trail Dr. trailhead.

The amount of use at Lost Creek Falls skyrocketed in 2020. Presumably, this massive increase in use was significantly influenced by Covid-19 and the resulting surge in outdoor recreation. The trail counter was replaced around the middle of the season, so some of the usage was projected, but the amount of traffic at Lost Creek Falls in 2020 (14,648) was over two times greater than the next highest year (7,193 in 2017).

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 40 users per day (in 2020). Prior to 2020, the peak use at the Lost Creek Falls trail was roughly 80 people per day. In 2020, the peak use was 274 (Sunday, September 6)! From July 1, 2020 through the end of October, the average daily use was nearly 110 people. The exceptional amount of use has also created the need for additional maintenance.

Since 2016, a counter has been installed on the trail near the trailhead 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%). Total use dipped slightly again in 2019, to 5,105, but rebounded sharply in 2020 at 14,648. Actual use would most likely be a little higher as 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 and still attracts some users looking to approach the falls from a different way.

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.

In 2019, an \$11,000 Recreational Trails Program (RTP) grant was awarded for various trail construction/rehab work on the Lost Creek Falls trail. These are federal funds administered through the DNR. A 50% project match is required and was budgeted in 2020. However, most capital projects were temporarily frozen to address budget concerns involving Covid-19. The project is expected to be completed in 2021 or early 2022 and will primarily address a few wet areas on the trail, as well as steps/stairs, or similar access features, to the river.

- 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.).

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.

Some of the major goals accomplished since 2019 include:

- Primary Parking Lot Development. Located on the east side of the river. This area will serve as the primary trail head/entry to the property.
- Secondary Parking Lot Development. Located on the west side of the river. This area is intended to serve as the primary access point to the falls located across the road. Having two parking areas should reduce the amount of foot traffic on Siskiwit Falls.
- In 2019, two \$30,000.00 grants, an Acquisition and Development of Local Parks (ADLP) Knowles-Nelson Stewardship grant and a Wisconsin Coastal Management grant (NOAA), were awarded to the Department. Funds from each grant will be used to repair and improve the existing fisherman/hiking trails located adjacent to or near the Siskiwit River. The funds will also be used to purchase signs and informational kiosk materials.
- A short hiking trail was mowed in the old hay field. This was accomplished via a partnership with the Town of Bell. The Town also mows the parking areas in the summer and plows the access road to the primary parking area in the winter.

- In 2020, planned trail improvement work located on the east side of the river was completed, including: widening and armoring (adding gravel) the existing tread; removing hazard trees; brushing the trail corridor; creating a new switchback trail on the northern most end of the trail; adding steps near the Town Road; and installing a short boardwalk on a wetter portion of the trail. In addition, a few signs/markers were also installed.
- In early 2021, an elevated boardwalk was constructed over a wet and narrow portion of the existing trail. This boardwalk was the major last piece needed to stabilize the existing fisherman trail located along the river.
- For detailed information on future plans for the Siskiwit property, see the 2021 Annual Work Plan.
- Fire Hill Preserve. In October 2018, the Department once again partnered with Landmark Conservancy on another potential land acquisition project. The Fire Hill Preserve Project is located in the Town of Bayfield and contains approximately 104 contiguous acres of forested land. To purchase the property, the Conservancy and Department collaborated on the development and submission of a Wisconsin Coastal Management land acquisition grant application (Landmark also submitted a Stewardship grant application).

If awarded, the grant would cover 40% of the cost of acquisition, with the applicant required to pay the remaining 60%. As part of required applicant match, the Conservancy has secured funds through donations and other grants (Stewardship), as well as a bargain sale from the current landowner, to cover the entire amount. The total project was estimated to cost nearly \$226,000, with little to no out of pocket expense from the county.

In December 2019, the county was awarded the Wisconsin Coastal Management grant. On December 27, 2019, the project officially closed. In early 2020, ownership of the Fire Hill property was conveyed to Bayfield County. Throughout 2021, the Department will begin the process of developing short and long term goals and objectives for the property (while collaborating with the Conservancy and Wisconsin Coastal Management, as well as the Town of Bayfield).

In general, the property will be managed as part of the county parks program. Most likely as a day use facility, with excellent potential for non-motorized recreational opportunities. The property is extensive, is located in an area that is frequented by a lot of people (situated in the middle of orchard/berry farm country within the Bayfield Peninsula) and contains an excellent existing road network for primary accessibility (most of which is paved).

Please refer to the 2021 Annual Work Plan for more information on plans for Fire Hill.

There are numerous other organized recreational events and/or activities that utilize portions of the county forest. For example, 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.

Recreation - Yurts

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).

Table 28 summarizes the rates of occupancy and total net revenues per yurt from 2016-2020.

Table 28: Yurt Occupancy (Nights Rented) and Total Net Revenue¹

Year	Bayfield - Evergreen ²		Bayfield - Terra Cotta ³		Cable ⁴		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
2019	255	\$15,982.10	238	\$16,114.74	167	\$10,357.22	660	\$42,454.06
2020	208	\$13,753.85	214	\$14,150.59	194	\$11,896.93	616	\$39,801.37
Total	1,034	\$62,585.93	482	\$31,977.74	724	\$44,449.39	2,240	\$139,013.06

¹ 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).

² The Bayfield - Evergreen location went live on October 8, 2016.

³ The Bayfield - Terra Cotta location went live in September 2018.

⁴ The Cable location went live on November 12, 2016.

In 2020, all three yurts were temporarily closed through a portion of March and nearly all of May in response to the Covid-19 pandemic (for a total of about 40 days each). In addition, throughout the month of May and into June, the yurts were occasionally closed to allow for more thorough cleaning and resting in between reservations. As a result, each yurt was closed for a total of about 65 to 70 days throughout CY 2020. Not surprisingly, there was a slight decrease in total occupancy rates at both Bayfield locations. In contrast, occupancy rates actually increased at the Cable location, primarily due to the stronger demand for outdoor recreational opportunities (and the fact that the occupancy rates in Cable had traditionally been much lower than those at both Bayfield locations).

When considering the total number of days each yurt was closed, occupancy rates in 2020 continued to remain very strong. Occupancy rates at each yurt were as follows: Evergreen – 71%; Terra Cotta – 73%; and Cable 66%. Peak use occurred in the summer months (June, July and August), where occupancy rates were averaging between 95% and nearly 100%. On average, the average number of people staying at the yurt is around 3 to 4. Using an average of 3.5 people per

night and 422 nights rented, combined, in 2020 a total of nearly 1,500 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. However, when compared to the 2019 occupancy rates and considering the number of days closed due to Covid-19, use of the Cable yurt increased by nearly 45% in 2020. The Covid-19 adjusted occupancy rate at the Cable location was roughly 66% on a total of 194 nights rented. Using the same average rate of occupancy as the Bayfield location, at 3.5 people per night and 194 nights, in 2020 a total of about 680 people stayed in the Cable yurt and recreated in the surrounding county forest.

When combining all yurt locations, a total of 616 nights were rented in 2020, for an average Covid-19 adjusted occupancy rate of around 70% (which is an increase when compared to the overall 2019 occupancy rate of roughly 61%). When considering the abundance of rave reviews the Department has received from very happy renters, roughly 2,150 people had a wonderful time recreating on the county forest while staying in the yurts.

Total net revenues received in 2020 from all yurt rentals was \$39,801.37. This represented a roughly 6% decrease when compared to the revenues received in 2019 (again, which was significantly impacted by Covid-19).

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%.

For more detailed information on the yurts, please see the 2021 Annual Work Plan.

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. Prescribed burning.
13. Support from professional forest management specialists, including forest hydrologists, wildlife biologists, forest ecologists, forest health specialists, GIS specialists, etc.
14. 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).
15. Assistance in the development and maintenance of the comprehensive land use and annual work plans.
16. Function as a catalyst for the transfer of technology and professional or scientific information, as well as providing opportunities for training or enhancement.
17. 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.

In August 2019, Bayfield County was one of four counties selected for a full re-certification audit (Douglas, Ashland and Barron were the other three counties).

The results of the audit were nearly perfect. Both SFI and FSC issued zero corrective actions (neither major nor minor) and reported zero opportunities for improvement. The county forest program received numerous accolades and commendations. All of which is extremely rare in a full re-certification audit and a reflection of a high quality forest management program administered by Bayfield County.

In 2020, as part of the routine annual certification audit for both SFI and FSC, the Wisconsin County Forest program once again received zero corrective actions and no additional opportunities for improvement. This marks two successive years of nearly flawless certification audits from both bodies.

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. The Department will continue working with each independent certifying body, as well as the DNR.

The results of the audit also help to solidify and 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. 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.

FOREST CARBON PROJECT

The County Forest provides an important ecosystem function in the form of carbon sequestration, or the uptake and storage of carbon in trees, shrubs, vegetation and associated wood products. The carbon sink in forests and wood products helps to offset sources of carbon dioxide released into the atmosphere i.e. as created by activities such as deforestation, forest fires, and fossil fuel emissions. Awareness of, or emphasis on, carbon sequestration has evolved over time, especially as concerns regarding a potentially changing climate and subsequent negative impacts have commanded more attention.

Sustainable forest management practices, such as those currently prescribed by the Department, can increase the ability of the forest to sequester atmospheric carbon, while still producing and/or enhancing other core ecosystem services i.e. timber products; recreational opportunities; wildlife habitat; improved soil and water quality. Harvesting and regenerating forests can also result in improved net carbon sequestration in wood products and new forest growth, especially when compared to other alternative land uses. Interest in forest carbon sequestration projects has also increased, as entities explore options or opportunities for climate change mitigation.

Over the past few decades, carbon markets have emerged as one option to address climate change related concerns. The voluntary retail carbon market continues to evolve, especially as an increasing number of individuals, governments, companies, and similar entities pledge and/or seek to reduce their carbon footprints or become carbon neutral. In response to the various (and often significant) commitments to reduce carbon dioxide emissions, carbon is now a priced and valuable environmental commodity in the global marketplace (with offsets available for purchase within the carbon markets). By allowing the broader public to engage in climate protection, the voluntary market has the potential to further advance societal awareness of carbon emissions, the potential impacts of climate change and the significance of consumer action and/or behavior.

Data regarding carbon sequestration is collected as part of the CFI program. Information from the CFI program can be used to develop, assess and analyze carbon stocks and trends on the County Forest (or carbon accounting). Carbon stock and trend information, in conjunction with other similar assessments on forest carbon, can help the Department better understand the correlation between carbon storage and impacts from a variety of different disturbances, either voluntary (i.e. timber management) or involuntary (i.e. natural disasters, insects/disease outbreaks, drought, etc).

Throughout most of 2020, the Department was actively involved in developing a forest carbon project, with the goal of participating in the voluntary market (selling carbon offsets) under the American Carbon Registry (ACR). In February 2021, Bayfield County officially approved moving forward with a forest carbon offset/marketing project that would involve most of the county forest (roughly 158,000 acres), but only if it was determined to be a good fit with the current mission of the Department, and it didn't conflict with County Forest Law. After both contingencies were satisfied, in early April 2021, Bayfield County entered into an agreement with Bluesource to help develop, register, verify and administer the project.

Bluesource will assist the county in all aspects of the carbon project including, but not limited to: development, listing, inventory (through the use of existing CFI plots and data), growth and yield monitoring, verification, registration, maintenance, administration, and marketing. The agreement

with Bluesource will be for the first 10 years of the project, but the terms of use with ACR will be for a 40 year period. Once the agreement with Bluesource has expired, the county will explore various options regarding the management of the project over the remaining 30 years.

The results of any forest carbon project could have the potential to alter and/or modify certain approaches or strategies regarding the sustainable management of the County Forest, as determined by the Administrator and/or Committee. Depending on the amount of carbon offsets available to market, as well as the price per unit during the time of sale, Bayfield County could realize a significant new source of revenue (i.e. between \$750,000 to \$1.5+ million per year).

Once a project has been listed with ACR, it is expected to take between 12 to 18 months to become verified and officially recognized (registered). As such, if the project is verified and registered, the first sale from the issuance of carbon credits is expected to occur in Q4 2022. Additionally, the county would be required to adhere to the strict guidelines and standards developed by the American Carbon Registry (for a period of 40 years).

The recognition of forest carbon is yet another important variable to consider when developing sound sustainable short and long-term management strategies for the County Forest.

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 29 displays a summary of permits issued on the forest from 2008 through 2020 (a summary of permitted events can be found in Table 24).

Table 29: 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	23	9	1
2019	284	10	2	5	4	24	4	2
2020	278	11	2	6	5	7	5	1
Avg.	375	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 2020, 278 firewood permits were issued, which is on par with the average over the past four years. However, in general, the total amount of firewood permits have decreased markedly since the all-time high was established in 2011 (503 permits issues). 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.

A permit to collect wild edibles was also re-approved in 2020. A permit to harvest/collect tamarack stumps was also approved in 2020. 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 a little higher than 2019. Access permits were steady in 2020, though significantly lower than what was requested in 2018 (most of the permits requested in 2018 were renewals). 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, though, due to limited participation, was extended through the 2020 season. Permits were also made available in 2021. While there is some potential for an expanded tapping program, the amount of resources available to develop a more robust program has been somewhat limited. Work on the development of a maple tapping program will continue in 2021, as time and resources allow.

Also, in 2018, the Department approved a request by the Red Cliff Band of Lake Superior Chippewa and Bayfield School District to tap trees on the forest for the collection of sap (eventual production of maple syrup and associated products). Red Cliff, in collaboration with the Bayfield School District, was awarded a USDA Farm to School grant for the production of maple syrup. The project involves student participation during every facet of the process (with the end product being used by the School).

The site selected for taping contains relatively poor quality sugar maple (and red maple), with low sawlog potential. Since these trees are being managed primarily for fiber production, there is little to no concern with regards to impacts on quality. The site was tapped in 2019 and again in 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 were 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 30 displays the total amount of sand and gravel and revenues received from 2008 through 2020.

Table 30: Sand and Gravel Summary

Year	Yards	Value
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
2019	0	\$0.00
2020	0	\$0.00
Avg.	4,349	\$5,260.31

** 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 2020. As displayed in Table 30, 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 31 displays a summary of the wildlife opening maintenance program, performed on county forest land, from 2008 through 2020.

Table 31: Summary of Maintained Wildlife Openings on County Forest Land

Year	Mowed Number	Mowed Acres	Hand Treated ¹ Number	Hand Treated ¹ 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
2019	69	71	18	9	87	80
2020	15	17	37	37	52	54
Average	45	47	49	38	94	84

¹ using a mix of herbicide and hand cutting

In 2020, 37 wildlife openings, totaling 37 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 15 openings mowed in 2020 for a total of 17 acres. In total, 52 openings, covering 54 acres were treated in 2020. 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. In 2019, the app was in the process of being installed on county servers. After addressing numerous technical issues, that work was completed in early 2021.

The Department is still periodically working with the DNR and other resource professionals to assist in additional/supplemental bird and/or other wildlife monitoring projects.

Wildlife Projects in the Barrens Management Areas (BBMA and BLBMA). 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. In 2019, one banded male returned to the site, but did not locate a female and did not nest. No other Kirtland's were observed in 2019. The project was not continued in 2020 due to Covid-19 related field restrictions.

The Barnes Barrens Area provides excellent potential 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.

The Department is currently collaborating with NRRI, the DNR and USFS regarding a sharp-tailed grouse banding project. Data received from such a project would be used to provide information on movement within the barrens and how stands are being utilized, on a daily basis, by the birds. The results could also be used to develop new or modify existing forest management strategies within the barrens, with the goal of optimizing habitat. See the Barnes Management Area section above (page 31) for more detailed information on accomplishments with the BBMA and BLBMA.

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.

Table 32 outlines some of the major grants and aids awarded to the Department over the past decade (2011 through 2020). Every award listed in the table, with the exception of the Arbor Day and FEMA grants, has come from the State of Wisconsin.

Table 32: Bayfield County Forestry and Parks Department Summary of Major Grants, Aids, Leases and Agreements¹

Year	County Forest Administrator	Wildlife Habitat Improvement ²	County Forest Road Aid	Sustainable Forestry	County Conservation	Arbor Day ³	FEMA	GNA	Total
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	\$0	\$84,379
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	\$39,628	\$183,262
2018	\$52,938	\$8,058	\$11,849	\$0	\$8,014	\$16,336	\$0	\$9,393	\$106,588
2019	\$60,704	\$20,057	\$11,836	\$4,375	\$4,235	\$5,000	\$96,766	\$41,516	\$244,490
2020	\$67,100	\$53,192	\$13,327	\$44,748	\$0	\$5,202	\$0	\$43,284	\$226,854
Average	\$52,855	\$13,873	\$11,932	\$13,295	\$4,714	\$14,149	\$18,218	\$13,382	\$142,417

¹ Emphasizing the Forest Management program and funds that were received per calendar year.

² Starting in 2019, includes funds received Wisconsin Habitat Partnership Fund Grant.

² In 2020, includes \$44,978.4 from the Wisconsin Habitat Partnership Fund Grant.

³ Also includes similar awards/donations.

In 2020, nearly \$227,000 was received from the major grants and aids. This was a decrease of roughly 7% when compared to 2019, primarily due to the large FEMA reimbursement.

The Sustainable Forestry grant and County Conservation Aids are generally highly 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 re-imburement 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. Other grants and/or aids are received within a calendar year, but may not be regularly recurring and, as such, are not included in the table listed above.

The Federal Emergency Management Agency (FEMA) is very sporadic and contingent upon a disaster declaration. Land acquisition grants from Knowles-Nelson Stewardship and WI Coastal Management are also awarded irregularly and on a project by project basis. But, when awarded, both grants have the potential to be substantial. While the Stewardship grant has primarily been used to purchase land that will be enrolled in CFL, the WI Coastal grant has primarily been used to assist in the purchase of unique properties with high conservation value. These properties have not been enrolled in CFL, but are still managed by the Department (primarily with a recreational emphasis i.e. Siskiwit Falls and Fire Hill).

Additionally, many grants are awarded in a specific calendar year, but full or partial re-imburement 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 occurred (expenses incurred) in 2018, 2019 and 2020 and the reimbursement funds were received in 2020.

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.

Table 33 summarizes GNA activity since 2016.

Table 33: Summary of GNA Activities (2016-2020)

Calendar Year	Fiscal Year	No. of Stands ¹	Total Acres ¹	Total Hours	Expenses	Revenues ²
2016	2017	15	381	326	\$21,033.35	\$0.00
2017	2018	20	675	372	\$23,960.56	\$39,627.93
2018	2019	17	889	334	\$24,164.40	\$9,393.10
2019 ³	2020	52	1,685	534	\$38,548.18	\$41,515.62
2020	2021	17	520	597	\$28,363.16	\$43,284.28
Total		121	4,150	2,162	\$136,069.65	\$133,820.93

¹ Total work assigned per calendar year per GNA contract.

² A portion of the revenues are generally received the year after work has been completed.

³ Of the total stands/acres, 17 stands and 634 acres were prescription writing only.

The scope of work is also 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.

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.

In 2019, 52 stands, covering 1,685 acres was included in the program contract. This represented the largest contract to date and included the addition of prescription only work (where the Department was responsible for writing a management prescription for stands, but did not physically establish or administer a timber sale).

In 2020, a total of 17 stands covering 520 acres was accomplished as part of GNA. As per every GNA contract to date, all stands included in the agreement were red pine, primarily plantations. In 2020, there was a significant increase in the percentage of red pine stands that required marking (where individual trees are marked for removal). Previously, row thinning (logger select) treatments were a significant proportion of the workload. In general, the time required to establish a timber sale that requires individual tree marking is significantly higher than one where a logger select row thinning is prescribed (which generally requires row designations and no individual tree marking).

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. In 2019, a total of 533.95 hours were applied to GNA work. In 2020, 597 hours were applied to GNA activities. Through 2020, a total of over 2,100 hours has been attributed towards the GNA program.

Work on the CY2020 program contract will continue in 2021. In addition, a sixth GNA program contract with the state will be developed in early 2021, for the management of red pine stands on the Washburn Ranger District. Starting in 2019, timber sale administration has become a significant GNA workload. The administration of timber sale contracts increased in 2020 and is expected to be a significant workload in 2021.

OTHER RECREATION ACCOMPLISHMENTS (State Funded Motorized Trails)

The management of county recreational trails was assigned to the Forestry and Parks Department in July 2013. Primarily, this involves the management/oversight of all state funded motorized trails located on county and private lands, but also includes groomed snowmobile trails on federal and state lands. To help accomplish this task, Bayfield County maintains agreements with the Bayfield County Snowmobile Alliance (which is an assemblage of local snowmobile clubs), local ATV clubs, the US Forest Service and the DNR.

Table 34 lists the total miles per motorized trails type, managed by the Department, as well as the amount of state maintenance aids received.

Table 34: Mileage and Funding For Trails Managed by Bayfield County

Trail Type	Miles	Rate/Mile	Total
Snowmobile	454.41	\$300	\$136,323
ATV Summer	86.75	\$600	\$52,050
ATV Winter	177.13	\$200	\$35,426
UTV Summer	86.75	\$100	\$8,675
Total	805.04		\$232,474

The State of Wisconsin provides annual aids for the maintenance of existing motorized trails 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 2020:

- ✓ 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). The grant will cover 100% of the costs. Some preliminary work on the design of the shelter began in 2019. Construction of the shelter was completed in 2020. The local clubs will be coordinating a work day to paint/stain the shelter in 2021.
- ✓ Erosion repair on a section of Trail 63 near Twenty Mile Creek.
- ✓ Continued to work on the 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. The goal is to make this route permanent.
- ✓ 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.
- ✓ A 30 acre parcel was purchased in the Town of Bayfield (off Pratt Rd). The property contains approximately ¼ mile of existing snowmobile trail 1 and roughly ½ of an existing bridge (this parcel contains a small portion of the Sand River). The property was purchased for \$15,000. A \$12,000 recreational (snowmobile) trail aids grant from the DNR was used to help purchase the parcel. The property is adjacent to county forest land and was enrolled in CFL.

When compared to previous years, 2020 was a relatively quiet year in terms of trail related issues. 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 nearly 1,300 miles of inventoried roads and trails on the county forest. Of that total, approximately 73% are accessible with an ATV/UTV and 44% 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. New well pump in the upper well (2019).
 - i. Reconstruction of the beach area.
 - j. New fishing pier near the beach area.
 - k. New ADA access ramp to the beach area.
 - l. Creation of new tent camping site.
 - m. Re-grade of the parking area to control runoff and improve drainage.
 - n. New gas hot water heaters, for each shower, in the shower building.
 - o. Installed high-speed wireless internet service throughout the entire campground.

- p. Installed new playground equipment near the beach area.
 - q. Re-established and re-surfaced the walking path near Puig's Point.
 - r. Improved an old dock and added a new access point to the lake.
 - s. Changed out all locks to the same keyset.
 - 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.
 - w. Erosion repair after two significant storms (2020).
 - x. Removed storm damaged slide from the play area (2020).
 - y. Remove tree from and repair the roof on the shower building (2020).
 - z. Temporarily installed security cameras in response to a theft of property occurrence (2020).
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. Minor maintenance on the wooden access ramp.
 - o. Re-located the fee tube due to previous theft related issues.
 - p. Replacement of picnic tables (ongoing - a little every year).
 - q. Numerous other minor improvements throughout the campground.
 - r. Erosion repair after two significant rainstorms (2020).
3. Atkins Lake Park (day use)
- a. New boat launch dock (2017).
 - b. A new primary park sign was installed in 2019.
 - c. Old fee tube was removed in 2020.
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 installed in 2019.

- g. New concrete slab around the hand pump in 2020 (6.5'x 6.5'x 3.5").
- h. New kiosk near the fee tube (2020).

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 35 summarizes the total amount of occupancy at each campground from 2011 through 2020. 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 35: Campground Rates of Occupancy and Total Revenues (Seasonal and Transient)¹

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
2019	19	1,058	\$68,960	15	503	\$39,122	0	513	\$6,617	34	2,074	\$114,700
2020	35	0	\$60,581	27	0	\$41,145	0	914	\$11,263	62	914	\$112,988
Average	23	756	\$58,573	14	326	\$28,255	0	476	\$5,807	37	1,558	\$92,635

¹ 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.

Covid-19 had a significant influence on the management of all campgrounds in 2020. As a response to concerns surrounding Covid-19, the Department made a significant temporary change to the way Twin Bear and Delta Lake was managed in 2020. Campsites at both properties were only available for rent by the season. Transient camping was not permitted at Twin Bear or Delta Lake in 2020. Also, the opening of each campground was slightly delayed to develop Covid-19 management strategies. In addition, the play area and beach were temporarily closed, the shower facility was closed for the entire season and only a limited number of restroom facilities were open for public use. Seasonal campers were only permitted if they had self-contained camping units (that contained a bathroom). Physical distancing and other precautionary measures as recommended by the CDC was required throughout the grounds.

The number of seasonal campsites available to rent at Twin Bear and Delta Lake was increased to achieve an occupancy rate of around 80%. In 2020, a total of 35 seasonal campsites were rented at Twin Bear and 27 at Delta Lake. A seasonal only structure at both Twin Bear and Delta Lake will also be administered in 2021. As concerns over Covid-19 dissipate and the threat/risk of contracting the disease have significantly diminished (as recommended by the CDC), a return to normal (or some form of new normal) is anticipated starting with the 2022 camping season.

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. Like Twin Bear and Delta Lake, the opening of Big Rock was delayed slightly in response to concerns surrounding Covid-19. However, even with the delayed opening, the total number of sites rented in 2020 nearly doubled the annual average over the past decade. The total sites rented at Big Rock in 2020 represented the largest total use on record.

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.

Like nearly everything else that happened in 2020, Covid-19 was a major influence. Public use of the campgrounds was different in 2020, primarily as a response to Covid-19, but overall revenues were very close to 2019 (a decrease of only 1.5%).

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.

OTHER NOTEWORTHY ACTIVITIES

Starting in March 2020, the Department underwent a significant change in operations. As per the response to Covid-19, many Department employees were either working entirely or partially from home. For those not able to work from home, additional new workspaces were established in other rooms of the courthouse, as well as within the Forestry shop, to accommodate social distancing. The general goal was to minimize the number of Department staff occupying an office space and reduce the risk of transmission/exposure. This structure has remained in place well into the spring of 2021. When the pandemic is officially over and a new normal is established, it is anticipated that a flexible work environment will be maintained.

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 over the past few years include:

1. Member of a Committee that updated the Economics chapter of the WDNR Silvicultural Handbook – Steve Probst.
2. Assisted in the Log-A-Load for Kids program – Steve Probst.
3. Member of the BMP for Water Quality monitoring/compliance team – Steve Probst.
4. Member of a Committee that updated the Jack Pine chapter of the WDNR Silvicultural Handbook – Andrew O’Krug.
5. Member of the WDNR Tree Marking Guidelines Ad Hoc Team – Jeremiah Neitzel.

6. WCFA representative on the Wisconsin Initiative on Climate Change Impacts, Forestry working group – Jason Holmes.
7. Member of the WDNR Natural Regeneration Ad Hoc Team – Mike Amman.
8. Member of the Captive Cervid Committee – Mike Amman.
9. Forestry stakeholder representative on the Wisconsin County Deer Advisory Council (CDAC) – Mike Amman.
10. Member of the WDNR Sharp-tailed Grouse Advisory Committee – Mike Amman.
11. WCFA Representative on the WDNR Recreation Stakeholders Committee – Jen Bratsch.
12. Core Member of the Bayfield Area Trails (BATs) Committee – Jen Bratsch.
13. Renewed MSHA Certification – John Mesko.
14. Maintained Herbicide Applicators License – Jeremiah Neitzel.
15. Maintained FAA license to operate drones – Mike Amman, Jason Holmes, Jen Bratsch and Steve Probst.
16. 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.
17. Presenter at the WI SAF Annual Conference in Wausau – Jason Holmes. The focus of the presentation was regeneration monitoring and deer browse issues.
18. Presenter at a meeting of the Northern Area GIS User Groups – Jason Holmes.
19. Guest Presenter at Northland College – Jason Holmes. Discussion of forestry and the county forest system during a Forestry class.
20. Presenter at a Wisconsin Woodland Owners Association meeting in Hayward – Jason Holmes. Adapting forest to climate change.
21. Presenter at a Northern Forest Birds Workshop in Ashland – Andrew O’Krueg. Overview of the Barnes Barrens Management Area.
22. Presenter at MN SAF Conference – Andrew O’Krueg. Presentation of the Barnes Barrens Management Area.
23. Presenter at the Wisconsin Sharp-tailed Grouse Society Annual Meeting in Red Cliff – Andrew O’Krueg. Summary of the Barnes Barrens Management Area.
24. Presenter at the Wisconsin Wildlife Society conference. Ruffed-grouse research and policy. Mike Amman. (in 2020).
25. Demonstration of Oak Wilt Treatments with Rec Groups and Industrial Landowners – Jeremiah Neitzel.
26. Demonstration of Tree Planting at Washburn Elementary School – Andrew O’Krueg.
27. Presenter(s) during the full dual forest recertification audit – the entire Department staff.
28. 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.
29. 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.
30. Innovation Award. In 2020, the Department was the recipient of the Wisconsin Society of American Foresters (SAF) Innovation in Forestry Award. SAF is the national, scientific and educational organization representing the forestry profession in the United States. The Innovation award is presented annually to a project, team, or an individual to recognize excellence in silvicultural innovation, transfer of knowledge, and/or outreach for the purpose

of furthering sustainable forest management in Wisconsin. Mike Amman and Jason Holmes accepted the award during the annual Wisconsin SAF meeting (which was held virtually in 2020).

MEET THE STAFF

The information listed above describes the general Departmental accomplishments for CY 2020. Below is a brief background history of Department and DNR staff employed to accomplish those goals (that were part of the Department in CY 2020).

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: Caleb Brown.

- a. Experience: Forester with Bayfield County since 2018.

- b. Highest Level of Education: Master of Science in Forest Biology from Purdue University.
- 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.

Inventory and Analysis Forester: Jason Holmes.

- a. Experience: Forester with Bayfield County from 2012 to 2018; Inventory and Analysis Forester from 2018 to present.
- b. Highest Level of Education: Master of Science in Forestry from Michigan Technological University.
- c. Primary Roles(s): develop and manage the CFI and FRM programs, including data analysis and reporting; provide a lead role in the management of the access management program; play a lead role in the management of various GIS databases; assist in other field forestry related tasks including timber sale establishment, inventory, and reforestation.

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: Lindley Mattson.

- a. Experience: Office manager with the Forestry and Parks Department since February 2019.
- b. Highest Level of Education: Bachelor of Science in Business Management from UW River Falls.
- 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.