

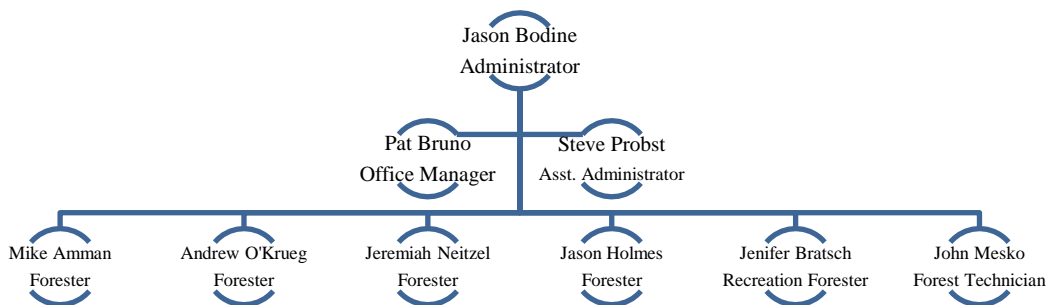
**BAYFIELD COUNTY FORESTRY AND PARKS DEPARTMENT
ANNUAL ACCOMPLISHMENT REPORT
FOR THE CALENDAR YEAR
2016**

FORESTRY AND PARKS COMMITTEE

Shawn Miller, Chair
Fred Strand, Vice-Chair
Harold Maki

Jeff Silbert
Larry Fickbohm

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	32,792.56	Clover	5,386.57	Port Wing	8,876.18
Bayview	13,151.47	Hughes	24,685.20	Russell	8,570.82
Bell	14,585.03	Iron River	6,042.22	Tripp	6,539.52
Namakagon	546.80				

Official County Forest Acreage: 171,993.06

There are approximately 2,000 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, monitor for potential trespass issues, and negotiate road/utility easements and sand and gravel permits.

COMPREHENSIVE LAND USE PLAN

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

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

There were no Land Use Plan amendments in 2016. However, the Forestry and Parks Committee and County Board of Supervisors approved the Department's 2016 work plan. The annual work plan gives direction and meaning to the Forestry and Parks Department budget, further defines and supplements the Comprehensive Fifteen Year Land Use Plan, and emphasizes current goals and needs of the County Forest, Parks and Trails Programs.

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

FOREST MANAGEMENT

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

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

For more detailed information on current goals, policies, procedures and general direction regarding the management of the county forest, please refer to the Fifteen Year Land Use Plan and 2017 Department Annual Work Plan. Both documents can be found online at: <http://www.bayfieldcounty.org/243/Plans>.

Below are accomplishment summaries of the major forest management goals and priorities.

- 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 treatments, responses 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.

Depending on actual field observations and the timber sale establishment process, total acres accomplished can be somewhat variable. Acreage goals are essentially targets, primarily based on a combination of existing stand conditions (and management direction) and long term projections.

Table 1 displays the sustainable harvest goals and accomplishments of the timber sale program by major forest type since 2010.

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

Species	2010		2011		2012		2013		2014		2015		2016		Average	
	Goal	Accomp.	Goal	Accomp.	Goal	Accomp.	Goal	Accomp.	Goal	Accomp.	Goal	Accomp.	Goal	Accomp.	Goal	Accomp.
Aspen ¹	870	853	1,189	1,191	1,005	1,230	1,170	1,151	1,265	1,314	1,300	1,292	1,340	1,340	1,163	1,196
Nor. Hdwd	900	418	914	973	1,321	1,349	970	1,069	900	857	835	804	895	870	962	906
Red Oak	670	607	808	798	763	577	795	680	700	981	820	823	870	872	775	763
Paper Birch	200	156	200	38	100	132	50	15	90	131	40	53	30	0	101	75
Scrub Oak	85	167	85	188	140	142	215	254	205	275	250	247	255	288	176	223
Red Pine	870	743	978	987	991	917	900	952	880	811	855	1,041	935	906	916	908
Jack Pine	540	518	516	480	504	493	275	274	190	182	165	194	365	498	365	377
White Pine	50	15	50	35	100	93	120	169	120	127	100	97	90	87	90	89
Fir/Spruce	100	180	100	140	60	25	130	119	40	36	40	44	40	44	73	84
Swamp Conifer ²	0	0	142	160	130	138	140	141	120	54	130	98	140	40	115	90
Swamp Hdwd. ²	0	0	126	0	120	87	50	41	110	74	110	88	100	41	88	47
Total	4,285	3,657	5,108	4,990	5,234	5,183	4,815	4,865	4,620	4,842	4,645	4,781	5,060	4,986	4,824	4,758

¹ Greater accomplishments are a result of managing some of the backlog² Timber types included in goals starting in 2011

Accomplishment Summary

A total of 4,986 acres of County Forest was sustainably managed in 2016, as part of the timber sale program. This represents an increase of roughly 35% when compared to the average accomplishments prior to 2012. The significant increase in accomplishment is a direct result of adding a new forester position in 2011. Also part of the total accomplishment for 2016 was the establishment of three wind blown salvage sales. The three salvage sales totaled 89 acres.

Total sustainable harvest accomplishments were nearly 99% of the overall goal for 2016. The goal for most major timber types fell within the target range.

The aspen goal was achieved at the 100% level; red oak was also met at 100% (over the total goal by 2 acres); white pine was achieved at nearly 100% (under goal by 3 acres); fir/spruce was also achieved at nearly 100% (over goal by 4 acres); northern hardwood was accomplished at nearly 97.5% (under goal by 25 acres, primarily due to timber sale design); red pine was accomplished at 97% (the thinning goal was met at target levels, but some stands scheduled for a regeneration harvest were not ready for management); and scrub oak was accomplished at about 113% of the goal (over by 33 acres, primarily due to heavy mortality and extremely low vigor exhibited in some stands).

Accomplishments for a few timber types fell well outside the target range. One such timber type was jack pine. As per the 2016 work plan, the target for jack pine was set a 365 acres. An emphasis was placed on managing all over mature stands, and those exhibiting high levels of mortality, over the next few years. The goal was established based on spreading out the management of these stands, with the knowledge that more may need treatment sooner.

As part of the plan for jack pine, if more stands were experiencing significant mortality, the actual management goal would be adjusted accordingly. The final accomplishment for jack pine was 498 acres, or 133 acres over the goal. The increase was a result of more stands needing immediate management, primarily due to significant mortality.

Other timber types, where accomplishments fell well outside the target range, were paper birch and the swamp types (conifer and hardwood). Swamp conifer and hardwood were added to the sustainable harvest goals back in 2011. Traditionally, these types had not been managed, primarily due to the nature of the stands (i.e. low productivity, wet soils, poor markets, etc).

To date, the swamp stands are primarily included on the harvest schedule as an attempt to identify and treat those that need, or are suitable for, management. Over a relatively short period of time, once the mature and suitable stands have been managed, it is expected that the goal for swamp conifer will decrease significantly. Swamp hardwood would most likely decrease as well.

The accomplishment for paper birch was 0 acres in 2016. Most of the mature stands of paper birch have either been managed or have died and naturally converted to other timber types. The last few remaining mature stands exist within the Red Cliff Reservation. The Department is currently working with the Tribe on access into these stands, but were unable to reach an agreement in 2016. The Department will continue attempts to gain access in 2017 with the goal of regenerating these stands before the opportunity naturally fades away.

In general, most of the harvest goal is in the form of a timber sale, however, there are occasions when a stand is updated and managed at a later date. 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, or when the stand is removed from management due to a restrictive feature i.e. riparian buffers or inoperable slopes.

On average, roughly 10% of the stands are either not ready for management, are incorrectly typed or are removed from the harvest schedule, as described above. However, one primary objective of the reconnaissance program is to provide accurate, up to date stand information across all timber types.

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.

In 2016, roughly 94% of the total accomplishment acres were in the form of timber sales (only 6% removed for the reasons described above). This is much more efficient than the average accomplishment from the past few years (again, typically around 10%), primarily because of the improved reconnaissance data.

Table 2 displays a summary of the accomplishments for the sustainable timber harvest program, from 2010 through 2016.

Table 2: 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	4,645	4,289	492	4,781
2016 ^b	5,060	4,718	304	5,022
Average	4,824	4,299	463	4,763

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

^b Includes 89 acres of blowdown salvage sales.

- 2) **Timber Sale Program:** Bayfield County offers two timber sale lettings per year, one in the spring and one in the fall. In 2016, a third letting was offered, solely for the three salvage sales.

Table 3 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 3: 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
Average	54	4,181	53	4,115	66	\$3,994,019	\$945	\$3,405,975

^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.

In 2016, once again, revenues from the sale of wood reached a record level. All-time highs in stumpage revenues have been attained in each of the past four years.

The total revenue from forest products harvested on County Forest land was \$5,041,999. When including the \$15,394 generated from the management on non-County Forest lands, the total timber revenues received by the Department was \$5,057,393 (the most of any County Forest program in Wisconsin in 2016).

This was an increase of 1% when compared to 2015 (which was the previous record for revenues), an increase of over 11% from 2014 and nearly 2.15 times greater than the average stumpage revenues received prior to 2012.

Timber Sale Contracts

In 2016, the Department awarded 65 new timber sale contracts (including the three salvage sales), covering 4,750 acres, with an estimated value of \$4,745,850. Total timber sales awarded in 2016 increased by 20% when compared to the previous year, however, total acres sold decreased by nearly 5% over that same time period.

The average winning bid values decreased significantly when compared to 2015, by a little over 37% (or a decrease of 31% when comparing bid values per acre). This decrease is significant, as it will 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 each timber sale are based solely upon the bid price per product per species agreed to as per the contract. In general, all timber sale contracts are awarded on a two-year basis, meaning a contractor has two years to complete the harvest.

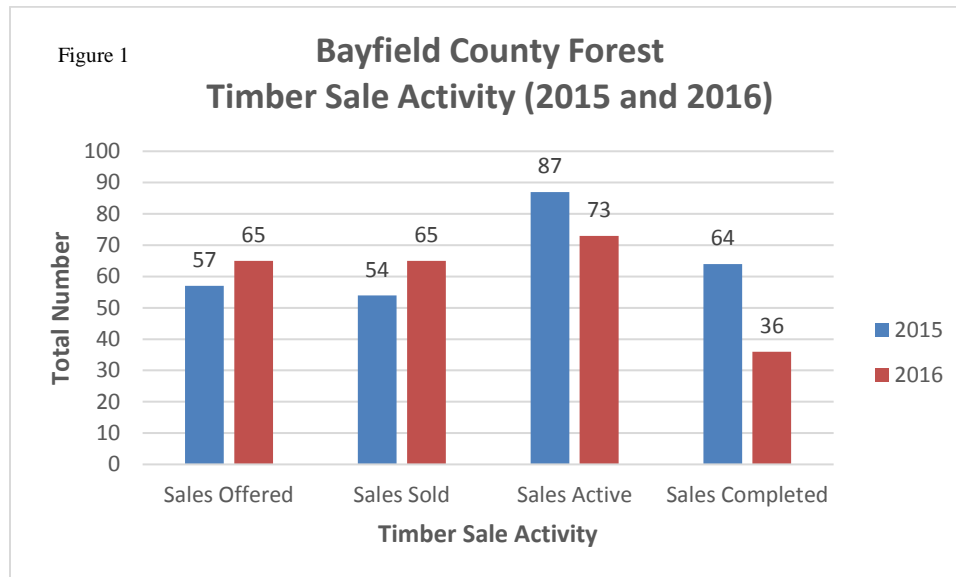
However, the Department will also routinely grant contract extensions. Each contract extension adds one year to the length of the contract. It's not uncommon for a contractor to be granted one or two extensions. In some instances, three and up to four, one-year extensions have been granted.

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.

Timber Sale Activity

A total of 73 timber sales went active in 2016. Timber sale activity can last anywhere from a period of a few weeks, to a few months, to most of a year, depending on the size of the sale, harvesting restrictions, operating conditions and the general goals of the contractor. As of the end of CY 2016, the Department has 133 timber sales under contract, with a total contract value of nearly \$12.0 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.

Figure 1 below summarizes timber sale activity on the forest over the past two years (2015 and 2016). Sales offered and sold, as well as sales that went active and those that were closed out (or completed) are also included.



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% comes from those sold during the current year, 20% from two years prior, 10% from three years prior and the rest beyond that.

For example, based on the above model, the general expectation is the 20% of the revenue generated in 2017 will come from sales sold in 2017; 45% from sales sold in 2016; 20% from sales sold in 2015; 10% from sales sold in 2014 and the rest from 2013 and 2012.

Referring back to Table 3, 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 and markets for early 2017 have not improved. As a result, and assuming a poor or below average market in 2017, the general prediction is a significant decrease in sale of wood revenues for 2017, by as much as 20 to 30%.

Harvested Volume

Table 4 displays the total volume of timber harvested from Bayfield County Forest timber sales from 2010 through 2016. 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 20% off all timber sales are sold by the ton).

Table 4 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 of the entire program).

Table 4: Bayfield County Forest Timber Harvest Volume Summary (pulp in cords and logs in thousand board feet)

Species	2010		2011		2012		2013		2014		2015		2016		Average	
	Pulp	Logs	Pulp	Logs	Pulp	Logs	Pulp	Logs	Pulp	Logs	Pulp	Logs	Pulp	Logs	Pulp	Logs
Aspen	15,041	3	14,570	0	14,647	1	20,288	0	26,154	0	23,486	0	19,295	0	19,069	1
Mx. Hardwood ¹	18,465	261	19,061	212	13,316	129	17,960	377	25,238	506	23,705	561	26,513	655	20,608	386
Oak	9,807	782	11,334	1,221	7,916	1,127	10,796	1,293	18,162	2,439	14,004	2,103	14,262	2,814	12,326	1,683
Paper Birch	736	43	766	13	1,083	22	1,169	17	562	9	383	6	702	25	772	19
Basswood	1,439	116	1,197	135	1,022	62	1,801	252	1,538	130	2,012	372	2,087	302	1,585	196
Red Pine	4,554	0	8,873	16	10,694	0	14,637	0	13,266	0	10,637	0	11,921	0	10,654	2
Jack Pine	6,572	0	4,533	0	5,352	0	11,211	0	5,715	0	5,633	0	5,342	0	6,337	0
White Pine	651	0	137	0	48	0	2,083	0	460	0	630	0	848	0	694	0
Other Conifer ²	302	0	669	0	465	0	1,079	0	2,227	0	2,533	0	1,402	0	1,239	0
Total	57,566	1,205	61,139	1,597	54,543	1,341	81,024	1,939	93,321	3,084	83,023	3,042	82,372	3,796	73,284	2,286
Total Cord Equiv. ³	60,218		64,653		57,493		85,291		100,107		89,715		90,723		78,314	
Revenue	\$2,047,663		\$2,477,066		\$2,696,756		\$3,904,104		\$4,534,831		\$5,006,565		\$5,057,393		\$3,674,911	

¹ Maple, yellow birch, ash

² Spruce, Fir, Tamarack

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

In summary, 2016 was another exceptional year for timber harvested on the County Forest. A little over 82,000 cords and nearly 4,000 MBF of logs were harvested. Total cords harvested was down by less than 1% when compared to 2015, but log volume increased by nearly 25% (mostly red oak logs).

Table 4 also includes a column for cord equivalents. This converts the log volume to cords as an attempt to quantify the total amount of wood harvested annually. Total cord equivalents in 2016 was nearly 91,000, which was about 1% more than 2015, but 9% less than the total amount harvested in 2014. The average cord equivalents since 2013 is roughly 91,500 cords per year. Prior to 2013, the average was about 61,000 cords, an increase of about 50%.

In general, aspen volume was down and at the lowest level since 2012. Mixed hardwood volume was the highest on record and roughly 12% greater than 2015. Red pine volume was also about 12% higher than last year and jack pine was stable. Log volumes were at an all-time high, primarily driven by red oak. Red oak logs increased by nearly 34% when compared to last year.

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

Table 5 displays the summary of the reforestation program.

Table 5: Bayfield County Forest Reforestation Program Summary 2010 - 2016 (acres)

Year	Planting				Seeding	Site Preparation				Maintenance			Monitoring
	Red Pine	Jack Pine	White Pine	Other ¹	Jack Pine	Trench	Fire Plow	Scarify	Spray	Fire	Spray	Bud Cap	Regen
2010	367	196	0	0	0	363	118	0	420	42	305	0	2,183
2011	319	153	35	68	0	900	88	0	186	21	324	0	1,424
2012	295	107	274	0	0	0	177	120	727	32	609	0	2,736
2013	281	174	92	0	558	264	0	40	0	0	449	239	2,522
2014	0	0	0	0	0	503	20	115	264	0	273	239	2,929
2015	62	0	129	0	202	717	0	99	634	0	0	239	2,337
2016	203	39	0	0	393	570	0	102	492	0	0	239	2,580
Avg.	218	96	76	10	165	474	58	68	389	14	280	137	2,387

¹ In 2011, tamarack and white spruce.

- a) Planting and Seeding: planting increased significantly in 2016, when compared to what was planted in 2015 and 2014. In total, 203 acres were planted with red pine and 39 acres were planted with jack pine. Both were planted at a rate of about 750 seedlings per acre. All seedlings were 2-0 containerized stock and planted by contracted crews.

A total of 393 acres were seeded with jack pine in 2016. Seeding occurs at a rate of about 4 ounces per acre (with local seed purchased from the WDNR nursery). Application is performed aerially, via a contract with the DNR. All seeded acres were previously trenched and sprayed 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.

- b) Site Preparation: to prepare sites for future planting or seeding, 570 acres were power trenched and 102 acres were scarified with a dozer and straight blade. All of the scarification was accomplished with assistance from the DNR. All trenching was accomplished with contract crews. Scarification occurred underneath an existing canopy of mature red oak to facilitate natural oak regeneration.
- c) Maintenance: in 2016, 0 acres were released from undesirable competition. Currently, most plantations are treated with herbicide prior to planting, 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.

Also, 239 acres of young jack pine plantations were treated with terminal bud caps to deter browsing from white tailed deer. All bud capping was accomplished with contracted crews. Assuming browsing pressure remains high in these stands, bud capping may be necessary every year for the next two or three years (or until trees have developed beyond the reach of white tailed deer). A few stands have now reached the minimum heights requirements (typically 5 to 6 feet) and will be removed from future capping schedules.

- d) Monitoring: nearly 2,600 acres of previous regeneration activities were monitored in 2016. This includes both artificial (planted or seeded) and natural regeneration. Most of the monitoring in stands regenerating naturally occurred in the red oak and northern hardwood types. These types typically require additional inputs to improve regeneration success, have larger densities of undesirable tree species competing for valuable growing space (i.e. ironwood), or have specific treatments that require more thorough monitoring.

Two deer exclusion fences are also maintained to monitor the effects of deer browsing on regenerating red oak, paper birch and white pine. The Department has also installed two smaller deer exclusion fences (83'x83' and 6'x6') in oak stands with the goal of monitoring the impacts of browsing on regeneration. In 2017, high density poly fencing will be installed within a series of northern hardwood gaps to monitor the impacts of deer browse.

More Information on Reforestation

As previously stated, reforestation can be accomplished by either natural or artificial means. Table 5 above tracks annual reforestation accomplishments, but primarily as they pertain to artificial regeneration or when additional inputs were required by the Department (i.e. site preparation, release, bud capping, etc.). In addition, most of the monitoring listed in Table 5 is centered around stands that were reforested artificially, those that also received additional inputs from the Department, or when the establishment of adequate and/or desirable regeneration is a concern i.e. excessive deer browse issues, most oak harvests, most white birch harvests, and some northern hardwood gaps (primarily where site quality is marginal and/or competition from ironwood is excessive).

Every stand that is managed by the Department is ultimately reforested. However, not all treatments are regeneration harvests. Some stands are thinned, where a small 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, these stands are

monitored more intensively, 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 sugar maple, 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 issues 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 slows growth (and can eventually kill the tree) and allows less desirable or undesirable (i.e. ironwood) species to attain and maintain dominance. 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.

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 5a summarizes the general management or reforestation goals for every completed (closed out) sale from 2011 through 2016 (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 5a: Summary of Treatments and Reforestation Activities on Completed Timber Sales (acres)

Year	Natural Reforestation ¹	Artificial Reforestation ²	Thinnings ³	Total Completed Sales	Total Sales Sold
2011	2,408	672	745	3,824	4,156
2012	1,515	265	939	2,719	4,782
2013	1,493	803	1,040	3,335	4,177
2014	3,010	574	1,238	4,821	4,388
2015	2,730	811	888	4,428	4,958
2016	1,299	268	848	2,414	4,750
Average	2,076	565	950	3,590	4,535

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 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 harvest at a later date. It's also common for 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 5a, the acres of completed sales are highly variable, ranging from a low of 2,414 in 2016 to a high of 4,821 in 2014. However, acreage of sold timber sales are relatively constant and stumpage revenues were at an all-time high in 2016, at just over \$5.0 million.

Of the completed sales, a vast majority are regenerated naturally, with an average of nearly 2,100 acres per year. An average of 565 acres are reforested artificially and 950 acres are treated with even-aged thinnings (or intermediate treatments). Red pine and red oak are the two most prominent timber types that receive intermediate treatments.

- 4) **Forest Reconnaissance Program:** forest reconnaissance, or updating stand information, is also a vital component of the forest management program. Accurate, up-to-date stand information is essential in the development of viable short and long term sustainable harvest goals. The accuracy of any sustainable harvest goal is only as good as the data from which it was derived. Therefore, it is important to update a certain level of stand information on an annual basis.

Table 6 displays the summary of compartment/stand updates from 2008 through 2016.

Table 6: Bayfield County Forest Inventory (acres)

Year	Goal	Accomplishment
2008	17,000	9,807
2009	10,000	2,872
2010	10,000	4,079
2011	10,000	9,728
2012	10,000	8,135
2013	10,000	9,316
2014	10,000	8,552
2015	12,500	16,868
2016	12,500	8,367
Average	11,333	8,636

Prior to 2014, the primary goal was to update stand information on a compartment level basis. The target had traditionally been 10,000 acres per year, with the goal of completing the inventory process every 15 to 16 years.

Starting in 2014, the decision was made to focus some of the inventory goal on specific forest types. The goal of stand specific inventory is to help in the development of more accurate short and long term management strategies on forest types that are, in general, mature or over mature, or where management philosophies or plans for a particular forest type have changed.

Stands of jack pine and red oak were targets in 2014. Red oak and northern hardwood were targeted in 2015. Northern hardwood and the remaining stands of red oak were targets in 2016. In total, 5,784 acres of compartments, 300 acres of mature red oak and 843 acres of mature northern hardwood were re-inventoried in 2016.

All of the mature jack pine and red oak stands have now been re-inventoried (roughly 3,000 and 10,000 acres, respectively). A considerable amount of northern hardwood stands remain (which continues to be a goal for 2017). Stand information will be evaluated to determine if any short or long term management adjustments (or direction) will be required.

From 2001 through 2016, approximately 90% of the forest (nearly 151,000 acres) and 92% of the compartments (185 out of 202) have been updated (via compartments level updates). The goal is to have all of the remaining compartments updated within the next two years.

In addition to compartment and targeted stand updates, 304 acres of individual stands were updated during the timber sale establishment process (see Table 2). Most updates were needed to correct inaccurate data or to remove a stand from the harvest schedule (i.e. riparian buffer or sensitive site).

Invasive Species

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.

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.

In 2016, approximately 11.5 acres were treated, by Department staff, to manage common buckthorn. Most of the treatments involved foliar chemical applications, but stump treatments occurred on stems that were too large to be treated with foliar spray.

In 2015, the Department received a \$37,500 Sustainable Forestry Grant for the 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 (hopefully eradicate) 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 will help kick start the program, which will require additional inputs in order to keep the problem in check.

In 2016, the same 48.5 miles were treated again. The expectation is that these roads will need multiple treatments before the infestation is under control. Follow-up treatments will also be required to reduce the potential for spread. Additional roads may also need treatment and will be evaluated on a case by case basis.

Land Acquisition

The Department will continue efforts to acquire private 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.

In December 2014, the Department received preliminary approval for two Knowles-Nelson Stewardship 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.

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 198.4 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).

When combining the land purchased in 2016 and the properties made part of the 2015 Stewardship project, the Department has added 2,800 acres to the County Forest over the past two years.

ROADS AND TRAILS

The Forestry and Parks Department maintains approximately 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. See Table 8 below for a summary of designated and non-designated road and trail mileage on the County Forest.

Primary Roads

Approximately 38 miles are classified as primary gas tax roads, which receive maintenance funds from the Wisconsin DOT (based on \$336/mile, but prorated depending on total miles enrolled in the program). These roads serve as primary access routes into portions of the county forest. A few of these roads located in the Towns of Barnes and Hughes also play an integral role in the wildfire protection plan that was developed in 2006 and revised in 2012.

The Department performed routine annual inspections on every mile of primary road to monitor for both road quality and invasive species in 2016. 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. Numerous roads were maintained in 2016.

Recreational Use - Trails

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

Table 7 displays the number of recreational use permits per recreation type that were approved in 2016. All approved permits were for events that utilized a portion of the Bayfield County Forest.

Table 7: Summary of Approved Events

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

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 17 organized events on County Forest land in 2016, a slight decrease from the previous year (18). Mountain biking and cross country skiing were the most common types, with a vast majority of events occurring in the Cable block. These events bring numerous participants and spectators to the area and are excellent examples of multiple use. The number of requests for mountain bike 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 Trail Association, North End Ski Club, Ashwabay Outdoor Education Foundation (AOEF), National Fish Hatchery, Town of Barnes 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 8 displays the approximate miles of designated trails currently located within County Forest boundaries.

Table 8: Summary of Designated Recreational Trails on Bayfield County Forest Land (miles)

Snowmobile	Walking	Dog Sled	ATV	Cross-Country Ski	Mountain Bike
105	15	44	52	31	25

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, 42% can be traveled with a licensed highway vehicle, 72% with an off-highway vehicle (i.e. ATV,UTV) and 91% with a snowmobile. In addition, all are open to hiking and virtually all are open to mountain biking, horseback riding and cross-country skiing.

The Department staff works closely with all 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.

Recreational Use – Yurts

In late summer 2016, the Department completed the construction of two rustic yurts on County Forest lands. One was located north of Whiting road, in the Town of Bayfield, just north of the Bayfield/Bayview Town line; while the other was located in Cable, east of Randysek Road and east of the North End cabin.

The entire construction process included, but was not limited to: location and clearing of the site, improvements to the primary access routes, construction of the yurt foundation and deck, installation of the yurt (purchased through Pacific Yurts), construction of the outhouse and firewood lean-to, establishment of the fire-ring and benches, installation of the furnishings, including a woodstove, two bunkbeds and associated mattresses (full on bottom and twin on top), and picnic tables (one inside and one outside), establishment of the parking area (for the Bayfield site), installation of signs and kiosks, development of rental policies and procedures (all reservations are currently handled through Airbnb), acquisition of all required local and state permits and variances, procurement of firewood (firewood for the woodstove is provided by the county) and development of informational and promotional materials. From start to finish, the total cost of each yurt was about \$30,000.

The Bayfield yurt was available to rent starting the first week in October, 2016. The occupancy rates for each month were as follows: October: 60%; November: 50%; December: 65%. Total days rented in 2016 was 50 out of 86 days open. Overall occupancy rate was about 60%

The Cable yurt was available to rent starting the second week of November, 2016. The occupancy rate for each month were as follows: November: 40% (on the days it was open); December: 35%. Total days rented in 2016 was 17 out of 51. Overall occupancy rate was nearly 35%.

Total net revenues received in 2016 from yurt rentals at both the Bayfield and Cable sites combined was a little over \$3,200 (again, for about 3 months of rental at the Bayfield location and 1.5 months at the Cable site). Bayfield generated roughly \$2,400 and Cable produced about \$800. As part of the process, the yurts are subjected to state and local taxes, as well as fees from Airbnb. Airbnb charges a flat rate of 3% per transaction. State sales tax is 5.5%. The room tax for the Town of Bayfield is 6.5% and the room tax for the Town of Cable is 4%.

The net revenue is the final amount deposited into county coffers once all the fees and taxes have been accounted for. If occupancy rates continue to exceed our conservative initial estimates, the Department could generate between \$15,000 to \$20,000 in combined net yurt revenues for CY 2017.

Town Road Aids

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 was made available to Towns in 2016, based on the amount of stumpage received in CY 2015. Of the 29 County Forests in the State of Wisconsin, Bayfield County is the only one to offer this unique additional source of funding.

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. Awards varied from nearly \$11,000 to Barnes and Bayfield to \$3,000 for the Town of Russell. The average award amount was a little over \$6,000. The program has been very well received, with many town roads seeing significant improvements and providing much better access to County Forest lands.

PERMITTED USES

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

Table 9: Bayfield County Forest Summary of Issued Permits and Approvals

Year	Fire Wood	Balsam Boughs	Cones	Christmas Trees	Birch Twigs	Access	Events	Disabled Hunting	Storage
2008	360	8	0	1	0	2	9	3	1
2009	423	5	1	1	0	0	10	3	1
2010	436	5	1	1	0	3	10	3	2
2011	503	7	1	6	0	9	10	10	2
2012	441	6	1	7	0	8	12	7	2
2013	406	16	13	3	2	6	17	6	2
2014	486	9	6	4	1	7	21	5	2
2015	394	8	5	5	0	10	18	9	1
2016	331	10	3	4	1	6	17	10	1
Avg.	420	8	3	4	0	6	14	6	2

Table 9 above displays a summary of permits issued on the forest from 2008 through 2016 (a summary of permitted events can be found in Table 7).

Firewood comprises the vast majority of the total permits issued on an annual basis. In 2016, 331 firewood permits were issued, down roughly 15% from 2015 and nearly 40% when compared to 2014. Firewood permits are free of charge and are available online (and have been so for the last few years). The relatively mild winters may be the primary reasons for the decline in firewood permits.

A permit to collect wild edibles was also approved in 2016. A permit to harvest/collect tamarack stumps was also approved in 2016. Both permits are new and unique and will be monitored to determine long term viability.

All other permits were relatively stable or aligned closely to the general annual average.

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.

Table 10 displays the total amount of sand and gravel and revenues received from 2008 through 2016.

Table 10: 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
Avg.	4,865	\$5,473.22

** Highway 13 Re-Paving Project*

The Department maintains two pits on the county forest: the largest one being in the Town of Bayfield, commonly referred to as the Sand River Pit (which is also where the staging of the Apostle Islands Sled Dog Race is held); with a smaller one off the end of Tulip Lane, in the Town of Russell.

Most revenues received from the sale of sand and gravel are deposited in a non-lapsing account for eventual site reclamation. A total of \$0.00 was generated from sand and gravel in 2016, as all pits were inactive.

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 11 displays a summary of the wildlife opening maintenance program from 2008 through 2016.

Table 11: Bayfield County Forest Summary of Maintained Wildlife Openings by Treatment

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
Average	41	42	57	44	98	86

¹ using a mix of herbicide and hand cutting

In 2016, 47 wildlife openings, totaling 33 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 51 openings mowed in 2016 for a total of 36 acres. In total, 98 openings, covering 68 acres were treated in 2016. 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. The results will be used to measure bird/habitat associations, anticipate how forest management may influence these relationships and predict general species occurrence. We are still periodically working with the DNR and other resource professionals to analyze the bird data and/or assist in other bird monitoring projects.

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

In 2014, the DNR detected one male Kirtland’s Warbler, with no females or nesting being located. In 2015, three males were detected, with no females or nesting being located. In 2016, the first confirmed nesting and successful fledging of Kirtland’s Warblers in Bayfield County occurred in the Barnes Barrens Management Area. All five nestlings successfully fledged.

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

FINANCIAL ASSISTANCE – GRANTS AND AIDS

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

Table 12 outlines some of the major grants and aids awarded to the Department from 2008 through 2016. Every award listed in the table, with the exception of the Arbor Day grant, has come from the State of Wisconsin.

Table 12: Bayfield County Forestry and Parks Department Summary of Major Grants and Aids

Year	County Forest Administrator	Wildlife Habitat Improvement	County Forest Road Aid	Sustainable Forestry	County Conservation	Arbor Day	Total
2008	\$31,933	\$16,929	\$10,440	\$39,720	\$4,125	\$0	\$103,146
2009	\$35,762	\$16,945	\$12,126	\$33,000	\$2,289	\$0	\$100,122
2010	\$44,039	\$8,472	\$11,390	\$6,205	\$3,807	\$20,400	\$94,313
2011	\$44,039	\$8,472	\$11,347	\$0	\$0	\$46,202	\$110,060
2012	\$46,877	\$8,472	\$11,330	\$0	\$6,500	\$18,450	\$91,629
2013	\$47,814	\$8,416	\$11,896	\$46,329	\$0	\$12,450	\$126,904
2014	\$52,885	\$8,015	\$11,917	\$0	\$4,183	\$0	\$77,000
2015	\$51,210	\$7,991	\$11,918	\$0	\$0	\$13,260	\$84,379
2016	\$51,382	\$7,986	\$11,942	\$37,500	\$0	\$20,250	\$129,059
Average	\$45,105	\$10,189	\$11,589	\$18,084	\$2,323	\$14,557	\$101,846

The Sustainable Forestry grant and County Conservation Aids tend to be the only state awards that are variable. Both are awarded based on the state fiscal year and revenues are received after projects are completed. In some cases, a project can be completed in one year, with actual reimbursement received the following year. The Sustainable Forestry grant is also competitive with other County Forest programs, and, therefore, not guaranteed. The Arbor Day grant is privately funded and also competitive. Funding from this grant covers trees purchased as part of the planting program.

In 2016, a little over \$129,000 was received from the major grants and aids. This was an increase of over 50% when compared to 2015 and the most received from this category in over the past 10 years.

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).

Below is a summary of all major accomplishments since the transition.

1. Twin Bear Campground
 - a. Complete electrical rebuild and upgrade throughout the entire campground.
 - b. Repair of all major outbuildings and store.
 - c. Reconstruction of the beach area.
 - d. New fishing pier near the beach area.
 - e. New ADA access ramp to the beach area.
 - f. Creation of new tent camping site.
 - g. Re-grade of the parking area to control runoff and improve drainage.
 - h. New gas hot water heaters, for each shower, in the shower building.
 - i. Installed high-speed wireless internet service throughout the entire campground.
 - j. Installed new playground equipment near the beach area.
 - k. Re-established and re-surfaced the walking path near Puig's Point.
 - l. Improved an old dock and added a new access point to the lake.
 - m. Changed out all locks to the same keyset.
 - n. Partnered with Brule River Canoe to provide canoe and kayak rentals.
 - o. Trimming of hazard branches and removal of hazard trees.
 - p. Numerous other minor improvements throughout the campground.
2. Delta Lake Campground
 - a. Complete camping pad re-grade on nearly all campsites.
 - b. New playground equipment near beach area.
 - c. New fishing pier.
 - d. Repair of all major outbuildings.
 - e. New electric added to last four remaining powerless campsites.
 - f. A small timber sale was established to remove all dead and dying hazard trees. Mostly over mature white birch and aspen.
 - g. Installed high-speed wireless internet service throughout the entire campground.
 - h. Added another mooring dock/fishing pier and small picnic area.
 - i. Replaced hot water heater in the shower building.
 - j. Changed out all locks to the same keyset.
 - k. Partnered with Brule River Canoe to provide canoe and kayak rentals.
 - l. Minor maintenance on the wooden access ramp.
 - m. Re-located the fee tube due to previous theft related issues.
 - n. Numerous other minor improvements throughout the campground.

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 13 summarizes the total amount of occupancy at each campground from 2011 through 2016. Seasonal represents the total number of sites that were rented for the entire season. While Day Use represents the total number of days non-seasonal campsites were rented within each campground. 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 13: Campground Rates of Occupancy, Both Seasonal and Day Use, and Total Revenues (2011-2016)¹

Year	Twin Bear			Delta Lake			Big Rock		
	Seasonal	Day Use	Revenue	Seasonal	Day Use	Revenue	Seasonal	Day Use	Revenue
2011	22	755	\$50,849	13	327	\$23,210	0	317	\$2,812
2012	26	632	\$56,448	18	246	\$27,998	0	327	\$3,860
2013	26	519	\$52,018	10	387	\$19,950	0	286	\$3,524
2014	28	539	\$53,822	10	388	\$19,303	0	303	\$3,733
2015	17	1,034	\$56,835	10	251	\$20,176	0	405	\$5,118
2016	18	876	\$57,401	12	298	\$25,304	0	491	\$6,209
Average	23	726	\$54,562	12	316	\$22,657	0	355	\$4,209

¹ Seasonal represents the total number of campsites rented for an entire season; Day Use is a summary of the total number of days non-seasonal campsites were rented at each campground.

Twin Bear is, by far, the most popular campground managed by the Department. With 43 campsites, it's also our largest. In 2016, 18 sites were rented by the season (a total of 18 sites are available for seasonal rental), while the remaining transient (or day use) sites were rented for a total of 876 days. As previously stated, seasonal sites were reduced in number (starting in 2015) and day-use sites were re-evaluated as an attempt to maximize the potential use of the park. As a result, day use has increased significantly (by nearly 60% when compared to the average day use from 2011-2014) and revenues in 2016 were at an all-time high. High-speed internet was installed in the campground in 2015.

Delta Lake contains 34 campsites, 12 of which are available for rent by the season. In 2016, all seasonal sites were reserved, with the remaining transient sites rented for a total of 298 days. Seasonal sites were also modified, starting in 2013, as an attempt to maximize the use of the park. High-speed internet was also installed in the campground in 2015.

Big Rock is the smallest of the three campgrounds, with a total of 13 sites. All sites are generally considered rustic, none of which have access to power. In 2016, day use at Big Rock established an all-time high, at 491 total rentals (revenues were also at an all-time high). A portion of the increased use may be explained as a reaction to the major wind storm event that occurred during the summer of 2016. The wind storm severely damaged Birch Grove campground (a popular rustic campground managed by the Forest Service, not too far, as the crow flies, from Big Rock) resulting in the closure of that park. Campers who would have used that campground may have chosen to camp at Big Rock. Trends will continue to be monitored to evaluate use.

Atkins Lake is a small day use park, but also contains a boat launch. Starting in 2015, the use of the boat launch was free of charge. Overall use at this location is difficult to track. We may install counters at the entrance to the park in an attempt to determine general use patterns.

In total, when combined, activity at all three campgrounds established all-time use (and revenue) records. 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.

TRAILS AND RECREATION

Recreation, whether motorized and part of the state funded system, or non-motorized and part of a designated trail network, is an integral and important component of any forest management program. Over the past few years, the Department has emphasized the importance of recreation (including efforts to maximize, or better capture, the recreational potential of the Forest). At nearly 172,000 acres and spread out over the length of Bayfield County, the Bayfield County Forest provides, or has the potential to provide, a plethora of recreational opportunities.

Incorporating recreation in typical forest management strategies can 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.

Motorized Recreation

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

Table 14 lists the total miles per motorized trails type, as well as the amount of state maintenance aids received.

Table 14: Mileage and Funding For Trails Managed by Bayfield County

Trail Type	Miles	Rate/Mile	Total
Snowmobile	437	\$250	\$109,250
ATV Summer	86.75	\$600	\$52,050
ATV Winter	168.15	\$100	\$16,815
UTV Summer	86.75	\$100	\$8,675
Total	778.65		\$186,790

The State of Wisconsin provides annual aids for the maintenance of existing motorized trails (see Table 14) 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 2016:

- ✓ Completed Trail 31 re-route, south of Iron River. Funded through a DNR Trail grant.
- ✓ Installed Privy on the intersection of Trails 22 and 24. Funded with a combination of DNR Trail grant and Recreational Trail Aids (RTA). Final approach work will be completed in 2017.
- ✓ Repaired numerous trails damaged from the two significant July 2016 storms (first the flooding event and then the major wind storm). The more significant repairs included:
 - Trail 63 near Grand View: Major trail blowout. WI DOT funded the all the repairs, including all Department administrative time.
 - Trail 63 near Drummond: Major washout on USFS land. Trail repair covered by a combination of USFS funds, and an emergency trail repair grant from the DNR.
 - Trail 18 in Town of Hughes: Numerous trail washouts. Repaired with FEMA funds. Project will be completed in 2017.
 - Trail 4 out of Mason in Town of Kelly: Trail washout. Repaired with large culvert.
 - Trail 15 in the Town of Grand View: Trail washout on USFS land. Funded with a DNR emergency trail repair grant.
 - Trail 31, north of Barnes: Several substantial washouts. Repaired with FEMA funds. Project will be completed in 2017.
 - Trail 1 in Town of Clover: a few substantial washouts. Repaired with FEMA funds. Project will be completed in 2017.
- ✓ Numerous re-routes of the snowmobile trail system as a result of closure on private lands. This will continue to be a problem in the future. Starting in 2017, the Department will begin working on a longer term solution or plan regarding identifying and securing critical sections of trail.
- ✓ Placement of gravel on numerous sections of ATV trail.

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

During any given year, routine maintenance can include the posting/maintenance of signs, brushing, removal of debris, mowing, grooming, minor washout or rutting repair, grading, placement of gravel, etc. Major rehabilitation can include significant culvert washouts, bridge repair, significant damage occurring as a result of flooding or other major storm event, etc. Addressing concerns or questions from private landowners (generally regarding trails approved for use on their property) is also a significant part of managing the motorized programs.

In addition to the state funded trails, the Forest provides numerous opportunities to recreate with a motorized vehicle. As previously stated, there is a total of just over 1,300 miles of inventoried roads and trails on the County Forest. Of that total, approximately 72% are accessible with an ATV/UTV and 42% accessible with a highway vehicle. The County monitors the condition of roads and trails and performs routine maintenance on a case by case basis.

Non-Motorized Trails

Numerous recreational opportunities exist on the County Forest. As stated numerous times, over 1,300 miles of roads and trails have been inventoried on the County Forest. Nearly all of these trails are available for hiking, biking, cross country skiing, snowshoeing and horseback riding.

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 non-motorized block in Cable and the low-motorized area 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.

In the Cable block, the Chequamegon Area Mountain Bike Association (CAMBA) maintains miles of mountain bike trails on the County Forest. The network includes a combination of single track trails, sustainably built specifically for mountain bike use, and existing logging roads. 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.

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. Both organizations maintain recreational use permits with the Department.

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

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

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

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

Recently, a branch of CAMBA (CAMBA North) was formed to develop a mountain bike trail network in the same general area near Mt. Ashwabay. In 2011, the Department approved CAMBA's proposal to construct up to 30 miles of new single track mountain bike trails on County Forest land. As of the end of 2016, nearly 11 miles of sustainably built, single track mountain bike trails have been constructed. Many of these trails are also being maintained in the winter by the North Coast Cycling Association (NCCA) for fat tire mountain bike use.

Non-motorized recreational opportunities abound on County Forest land. In addition to those previously mentioned, some of the more popular designated trails include the 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. 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 in the process of developing a new recreation strategy that will, in part, better identify existing infrastructure and future potential, as well as define future direction. Non-motorized and motorized recreation, throughout the County, will be explored as part of the process. In the meantime, in 2016, the Department continued improvements to the Lost Creek Falls trail, located just south of Cornucopia, which provides access to the only waterfalls located on County Forest land.

Improvements to the Lost Creek Falls trail include: the construction of boardwalks over the more prominent wet areas, the construction of new trail surface in areas that were otherwise unsustainable, installation of gravel, improvements to and expansion of the parking area, improved signage and trail markers, and the installation of an informational kiosk. The response to these improvements has been tremendous (the Department has a trail counter installed at the trail head),

as average use has increased from about 2 users per day (averaged throughout the year) to about 20 users per day.

PROFESSIONAL DEVELOPMENT, REPRESENTATION AND PARTICIPATION

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

1. Member of a Committee that updated the Economics chapter of the WDNR Silvicultural Handbook – Steve Probst.
2. Member of a Committee that updated the Jack Pine chapter of the WDNR Silvicultural Handbook – Andrew O’Krug.
3. WCFA representative on the Wisconsin Initiative on Climate Change Impacts, Forestry working group – Jason Holmes.
 - a. Presented and was part of a panel discussion regarding climate change, as part of a Wisconsin Master Naturalist program – Jason Holmes.
4. Member of the WNDNR Natural Regeneration Ad Hoc Team – Mike Amman.
5. Forestry stakeholder representative on the Wisconsin County Deer Advisory Council (CDAC) – Mike Amman.
 - a. Presentation regarding the significance of deer browse on county lands as part of a Wisconsin Outdoor Communications Association meeting – Mike Amman.
6. Guest presenter as part of a forestry class at Northland College – Jason Holmes.
7. Hosted a forest management field tour as part of a forestry class at Northland College – Jason Holmes and Mike Amman.
8. As part of professional development, all staff members attend various meetings, conferences and technical training sessions throughout any given year.

MEET THE STAFF

The information listed above describes the general Departmental accomplishments for CY 2016. Below is a brief background history of Department and DNR staff employed to accomplish those goals.

Administrator: Jason Bodine.

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

Assistant Administrator: Steve Probst.

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

Provides lead field role in all aspects of timber sale administration.

Forester: Mike Amman.

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

Forester: Andrew O'Krueg.

- a. Experience: Forester with Bayfield County from 2010 to present.
- b. Highest Level of Education: Bachelor of Science in Forest Management from UW Stevens Point.
- c. Primary Roles(s): timber sale establishment, forest reconnaissance, reforestation and regeneration monitoring and database management (GIS and WisFIRS). Assist in other aspects of the forest management program.

Forester: Jeremiah Neitzel.

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

Forester: Jason Holmes.

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

Recreation Forester: Jenifer Bratsch.

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

Forest Technician: John Mesko.

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

Office Manager: Patricia Bruno.

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

manages and prepares all financial records, statements and reports, provides customer service.

WDNR – County Forest Liaison Forester: Joseph LeBouton.

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