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BAYFIELD COUNTY FORESTRY & PARKS DEPARTMENT ANNUAL WORK PLAN

January 1 through December 31, 2018

The Bayfield County Forestry and Parks Department Work Plan for calendar year 2018 gives direction and meaning to the Forestry and Parks 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. This plan also complies with Chapter NR47 Wisconsin Administrative Rules for the administration of the County Forest Administrator Grant Program.

SUSTAINABLE TIMBER HARVEST

One of the primary missions of the Bayfield County Forestry and Parks Department (hereafter "Department") is to manage, conserve, and protect the natural resources of the county forest. Multiple use and sustainable forest management practices will be utilized to provide a wide variety of forest products and amenities for current and future generations. Sustainable forest management is commonly defined as meeting the forest resource needs and values of the present without compromising the similar necessities of future generations.

Wisconsin's county forests are governed under County Forest Law (s. 28.11) and were created to become working forests, with an emphasis on optimizing the production of forest products and maximizing public benefits. Below is the purpose statement as found in s. 28.11(1):

> *The purpose of this section is to provide the basis for a permanent program of county forests and to enable and encourage the planned development and management of the county forests for optimum production of forest products, together with recreational opportunities, wildlife, watershed protection and stabilization of stream flow, giving full recognition to the concept of multiple-use to assure maximum public benefits; to protect the public rights, interests and investments in such lands; and to compensate the counties for the public uses, benefits and privileges these lands provide; all in a manner which will provide a reasonable revenue to the towns in which such lands lie.*

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 46,000 hour annual threshold, a general proration is adopted to equally adjust the final figure accordingly.

On the Bayfield County Forest, the annual time commitment allocated by the DNR to the county has been calculated at 3,395 hours. This calculation was established from FY 2014 through 2018. Time standards will be revisited in CY 2018 to determine the next four to five year commitment. It is expected that the that the total annual time commitment will remain around 3,400 hours per year.

As part of the 3,395 hour 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. Regeneration monitoring, both artificial and natural.
5. Timber stand improvements (TSI).
6. Timber sale administration.
7. Mechanical site preparation for natural regeneration.
8. Mechanical site preparation for artificial regeneration.
9. County forest road and trail construction and maintenance.
10. Road right of way and wildlife (game) opening mowing/maintenance.
11. Support from professional forest management specialists, including forest hydrologists, wildlife biologists, forest ecologists, forest health specialists, GIS specialists, etc.
12. 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).
13. Assistance in the development and maintenance of the comprehensive land use and annual work plans.
14. Function as a catalyst for the transfer of technology and professional or scientific information, as well as providing opportunities for training or enhancement.
15. Financial support through various grants, aids and loans.

Forest Certification

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

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

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

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

In 2018, the Department will continue working with each independent certifying body, as well as the DNR. 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.

Sustainable Harvest Goals

The Bayfield County Forest totals 171,993 acres (and growing), making it the fourth largest county forest in the state. Optimizing the production of forest products was the primary reason the county forest program was developed. Timber harvests are important for the economic well-being of Bayfield County, as well as for the health and vigor of the forest.

One of the major objectives of timber management is to produce a perpetual sustained yield of forest products. In part, this is realized through the analysis and scheduling of forest stands for management and, ultimately, the development of sustainable annual and long term harvest goals. Implementation of sound, professionally recognized forest management and harvesting techniques is an essential part of the process.

Numerous criteria are analyzed when developing short and long term sustainable forest management goals. Existing reconnaissance data (as entered and compiled in WisFIRS, short for Wisconsin Forest Inventory and Reporting System, a data management application developed and maintained by the WDNR), along with thorough field inspections conducted by professional Department and DNR foresters, will be used to determine which stands are ready for treatment.

Short or long term adjustments to the management approaches or philosophies of specific forest types may also be incorporated in the goal development process. Such modifications may be needed as a means to address numerous challenges that eventually (or inevitably) arise over the course of managing a vast and diverse forested resource. Some of which include: addressing unbalanced age class distributions; the management direction of timber types where a large percentage of the acreage base is either at or approaching maturity; unpredicted or unexpected responses to previous silvicultural treatments; response to insect or disease outbreaks or other natural disasters (i.e. wind storms); challenges regarding natural or artificial regeneration (i.e. deer browse or other forms of herbivory, invasive species control, competition from undesirable vegetation, etc); and responses to research or other professional recommendations regarding the management approaches of specific forest types or communities.

In addition, the long term monitoring of stands that have previously received treatment is crucial in determining the success of past management practices. The results of previous management will also aid in the development and implementation of future prescriptions. The Department will be incorporating a permanent continuous forest inventory program in 2018 (please see page 21 for more information).

- The estimated 2018 sustainable timber harvest goal for the Bayfield County Forest is 4,642 acres. This represents a decrease of 388 acres (roughly 8%) when compared to the harvest goal for 2017 (5,030 acres).

As previously stated, numerous factors have the potential to influence the harvest goal for any given year. Below is a brief summary regarding the 2018 management approaches, issues, philosophies, and/or direction for the major timber types on the forest:

Jack Pine (and Barnes Barrens Management Area):

At nearly 12,500 acres, jack pine is the fifth largest timber type on the county forest. It's also a very young type, with over 55% of the acreage base established within the past 20 years and another 25% between 21 and 30 years ago (nearly 80% of the acreage base is less than 30 years old).

Jack pine exists in basically two areas on the forest, all within the Northwest Sands Ecological landscape. Roughly 2,500 acres occurs on sandy soils in the northern parts of the county (mostly east of Valhalla – on the northeastern most fringe of the NW Sands) and 10,000 acres in the barrens areas located between Iron River and Barnes.

Most of the jack pine stands located in the barrens north of Barnes are part of the Barnes Barrens Management Area (currently at roughly 7,000 acres of jack pine within the Area). This special management area was formally designated in 2012 with the goal of developing and maintaining critically important Pine Barrens habitat through the simultaneous management of jack pine and

open/early successional barrens. Among other things, the Barrens Management plan defines operational parameters and guidelines that must be followed to achieve the desired future condition.

A few important objectives of the Barnes Barrens Management Plan are as follows (for detailed information on the Plan, please visit our website at https://www.bayfieldcounty.org/243/Plans):

- Delineate approximately 11,500 acres as a special management area on the Bayfield County Forest for the simultaneous management of timber products and the development and maintenance of early successional Open and Brush Prairie Pine Barrens habitat.
- Identify, delineate and maintain a "core" area and four management zones within the special management area. Prescribed fire and/or chemical treatments will be utilized to maintain the permanent core area in an open condition. Approximately 307 acres of the core are scheduled for treatment (via burning) in 2018.
- Each management zone surrounds a roughly 1,000 acre, permanently open core area and ranges in size from roughly 2,500 to over 2,900 acres. The management zones are assigned a 12 year harvest interval (each zone is completely harvested over a period of 12 years). During the harvest interval, whenever possible, all stands within each zone will be harvested and seeded or planted exclusively to jack pine (though seeding is preferred). From the time of harvest until the point when the jack pine regeneration is approximately 10 feet in height, stand characteristics will meet the criteria for Brush Prairie Barrens. Typically, suitable Brush Prairie habitat will exist for 10 to 15 years after harvest. The habitat created during this 10 to 15 year window will serve as temporary or "surrogate barrens". Combined with the permanently open core, when fully established, between 3,500 to nearly 4,000 acres of prime barrens habitat will exist within this special management area.
- Develop a timetable for the systematic harvest and regeneration of timber within each designated management zone. When fully regulated, jack pine stands will be managed on roughly a 48 year rotation (as stated above, it will take about 12 years to manage each zone).
- Designate approximately 200 contiguous acres within each zone as Kirtland's Warbler Habitat Areas (KWHA). Reforest these areas to jack pine at densities that are conducive to creating suitable Kirtland's Warbler habitat. Currently, suitable habitat contains at least 1,200 stems per acre, combined with 1 to 5 unforested openings per acre. Openings should total approximately 25% of the stand and be evenly distributed (the first confirmed nesting and successful fledging of Kirtland's Warblers in Bayfield County occurred in the Barnes Barrens Management Area in 2016. All five nestlings successfully fledged). Birds were also observed and banded in 2017, however, no documented nesting activities occurred.
- Some aspen, red pine and scrub oak will also exist within the Barrens, but the goal will be to regenerate jack pine whenever possible.
- Development of the Barrens will take some time, as the Department is still managing the results of previous management (with a diversity of species and age classes). However, the core area is on target to be fully established by at least 2035 (and probably much sooner). Once all stands are addressed and ready for management, the Department will begin the harvest of Zone 1, thus marking the beginning of the floating barrens.
- In the meantime, the Department will continue to monitor the effectiveness of the plan. As with any plan, amendments, alterations or modifications are expected. The Department will also continue to work with the DNR regarding the technical aspects of barrens development and maintenance.

In the jack pine type, for the past decade, the Department has attempted to carry mature stands on the landscape for as long as possible. This was done primarily to provide a relative even flow of annual harvest, as well as to maintain a level of mature jack pine on the forest (i.e. structural diversity).

However, currently, many stands are experiencing significant mortality, at levels equal to or exceeding 30%. The Department can no longer carry these mature stands without experiencing even greater losses of volume. A higher percentage of dead and dying trees also increases the risk of insect and/or disease outbreaks (as well as heavier fuel loads), which would potentially have a negative impact on other stands in the area. As a result, the short term objective was to manage all stands experiencing 30% mortality or greater within a two to three year period. That process started in 2016, continued in 2017 and will be completed in 2018.

In 2016, the focus was managing the targeted stands within the Barnes Barrens Management Area. In 2017, the focus was on stands located outside the Barrens. A few remaining stands outside the Barrens will be managed in 2018, however, the accelerated harvests of 2016 and 2017 have already addressed the stands with the highest levels of mortality.

Once the management of the over mature stands is completed (by the end of 2018), it is anticipated that the vast majority of remaining mature jack pine will be managed within the next five to ten years (again, with an emphasis on carrying mature stands for as long as possible). Afterwards, it is anticipated that there will be a narrow window where significantly less jack pine will be managed, at least until the next larger age classes begin to reach maturity (generally between 50 to 60 years of age).

- The 2018 goal for jack pine will be broken into two parts: 158 acres located outside of the Barnes Barrens Management Area and 34 acres located inside the Barrens, for a total of 192 acres. This represents a decrease of 153 acres (nearly 80%) when compared to the total goal for 2017 (345 acres). The significant decrease is due to the accelerated harvest associated with high risk stands that has already occurred. If the Department determines that other stands are rapidly deteriorating or otherwise need to be managed immediately, the goal for 2018 may be adjusted accordingly.

  The Department will also continue to manage stands located within the Barnes Barrens Management Area as outlined in the Barnes Barrens Management plan. Modifications to the plan may be necessary, depending on a stands response to treatment or the development of better direction, and will be addressed on a case by case basis.

<u>Red Pine:</u>

Red pine is the third largest timber type on the county forest, comprising a total of nearly 18,000 acres. Most of the acreage base is composed of plantations, but about 1,000 acres of natural stands exist. Natural stands tend to be much smaller in size (acreage) and widely scattered throughout the forest.

The general model for red pine management is fairly simple. Most of the management centers around stands of artificial origin (plantations). In plantations, once stands reach the stage in which

they can be managed (typically around 30 years old), a timber sale is established. That harvest cycle is then repeated about every 10 years. Once a stand has been thinned about three times, harvest intervals tend to slow a bit, primarily contingent upon the growth response from previous treatments. At this point, harvest intervals can still be on a 10 year cycle, but more typically end up closer to every 12 to 15 years.

Depending on a variety of factors, including responses to previous treatments, presence of insects or disease, general management direction for the timber type, forest product development and markets, etc., the stand can be rotated anywhere between 70 and 120 years of age (a little earlier or later depending on the above mentioned factors).

Rotation typically involves prescribing a clearcut, in which all trees are removed (especially critical if re-establishing a red pine plantation, as older trees can be vectors for future insect or disease infestations). Natural stands are managed as well, with a focus on stands of higher density or those that have enough acreage for harvest. However, roughly 95% of the harvest goal is derived from the management of plantations.

- The 2018 goal for red pine is 930 acres (roughly 870 acres prescribed for thinning and 60 as regeneration). This represents an increase of 15 acres (or about 2%) when compared to the goal for 2017 (915 acres).

Northern Hardwood:

In the northern hardwood type, prescriptions for existing stands have repeatedly conflicted with field observations. Previously, the standard prescription given to nearly all northern hardwood stands was un-even aged (or all-aged) management or a thinning, regardless of stand or site quality. Consequently, over the past 20+ years, many stands have been managed with un-even aged prescriptions (i.e. relatively light selective harvests which incorporate small gaps to facilitate new regeneration).

Northern hardwood stands developing on drier (or wetter) sites of medium to medium-poor quality have generally not responded well to the traditional methods of management (or traditional thinking). Growth of residual trees has been relatively poor, desired regeneration has been sporadic and slow to develop, and competition from undesirable regeneration has been, at times, very aggressive (primarily ironwood).

Through routine and regular regeneration monitoring, the Department is discovering that regeneration gaps (associated with traditional un-even aged management practices) are oftentimes dominated by ironwood, while the preferred species that do regenerate (i.e. maple, basswood, yellow birch, oak) are low in number, slow to develop/grow and/or repeatedly browsed by deer (which allows them to get quickly overtopped by undesirable species). Growth and development on the remaining stems is also largely poor and slow, with stands, in general, just not responding to the traditional practices. Additionally, it was discovered that previous treatments oftentimes didn't adequately incorporate regeneration gaps, in both size and total number (something the Department has remedied through the establishment of a systematic approach to gap design and placement). All of which is a serious concern.

The county forest contains nearly 20,000 acres of northern hardwoods (including stands typed as red maple), making this the second largest cover type on the forest (aspen being the largest). For the reasons previously stated, the Department is in the process of re-evaluating the management approach on all stands of northern hardwood, especially those developing on medium to medium poor quality sites. The Department is finding that more intensive or less traditional methods of management on these poorer quality sites, that utilize larger canopy gaps, groups or patches, or even aged practices, generally yield more favorable results.

One goal for 2018 is to continue updating all recon information in the northern hardwood type, with a focus on stand and site quality (both existing and potential) when developing future prescriptions. Results from previous management and subsequent regeneration monitoring will also aid in the development of future prescriptions.

Once all stands have been updated (again, the goal is to have that completed by the end of 2018), it is anticipated that many of those developing on poor to medium-poor quality sites will be managed with more intensive un-even aged or even-aged treatments, while stands on medium quality or better sites will continue to be managed with more traditional un-even aged prescriptions.

Whether traditional or more intensive, all regeneration gaps associated with all uneven-aged treatments will continue to be designed and applied systematically. The systematic approach to gap placement ensures that all gaps are of the appropriate size and evenly distributed throughout the stand. Systematic application also helps to ensure that prescribed stand level gap targets are met (i.e. a typical prescription may have a goal of 10% to 20%, sometimes more, of the stand in gaps).

Knowing the general gap size and total number installed also makes it easier to determine stand level accomplishments. Flexibility is also part of the design, as gaps can be moved slightly or excluded altogether, depending on the overall goals of the prescription. Systematically installed gaps are also easy to re-locate, which is critical when performing routine monitoring or when needing to address issues/concerns regarding regeneration (i.e. site preparation, competition control or supplemental planting).

When utilizing un-even aged management methods on the poorer quality sites, whenever practical, larger gaps (or groups) will be incorporated with lighter thinning as an attempt to maintain structural integrity within the stand, develop a new age class (regeneration), increase species diversity (regeneration) and improve quality on the remaining/residual trees. In general, it's understood that growth and development on poorer quality stands will be significantly less than similar treatments on better sites. It is also anticipated that the amount of time between thinnings (or thinning intervals) may increase slightly.

Traditional methods state that re-entry should be attainable every 10 to 20 years (depending on growth and response to previous treatment). Northern hardwood growth and development is typically much slower on sites of lesser quality. As a result, re-entry may be feasible every 20 to 30 years. As with all plans, goals and direction may be modified based, in part, upon measured responses to previous treatments.

- The 2018 goal for thinning or un-even aged management of northern hardwoods is 480 acres, which represents a decrease of 75 acres when compared to the goal for 2017 (555

acres). The 2018 goal for even aged management is 240 acres, which constitutes a decrease of 95 acres when compared to the goal for 2017 (335 acres). The overall northern hardwood management goal for 2018 is 720 acres, which is a decrease of 170 acres (or about 23%) when compared to the goal for 2017 (890 acres).

Based on preliminary recon information, the total harvest goal for northern hardwoods is expected to continue decreasing, albeit slightly, to an average hovering between 700 to 750 acres per year. Of that total, the amount of acres thinned (un-even aged management) are expected to decrease slightly (compared to current levels), while the amount of acres regenerated (even-aged management) are expected to increase. However, since more trees per acre are removed during regeneration harvests (when compared to lighter thinnings), the total amount of northern hardwood volume should remain about the same every year.

Red Oak:

The Department also recently completed the re-inventory of all mature stands of red oak on the forest. This was accomplished over the past few years, as an attempt to better capture management needs and priorities. As expected, the updating process has revealed a significant decrease in acres ready for, or otherwise in need of, a thinning.

There is a little over 15,000 acres of the red oak type on the forest. Of that, nearly 90% is older than 75 years (nearly 13,500 acres). To drill down further, nearly 65% is 90 years of age or older (approximately 10,000 acres). In essence, the vast majority of red oak on the forest is either at or rapidly approaching maturity.

The rotation age for red oak is generally around 100 years of age (up to 120 years on higher quality sites and lower on poorer quality sites). At current conditions, the Department is faced with the potential task of addressing (regenerating) a large acreage base of mature red oak, basically all at the same time. That's neither practical, nor feasible. This is a prime example of where management goals sometimes need to be adjusted in order to better manage a resource.

The general management direction for red oak is to maintain the type (dominance), where practical, and spread out or distribute the regeneration phase as much as possible. It will vary by location, but, generally speaking, and barring any natural influences i.e. insects, disease, wind, drought, etc., the regeneration phase can be extended equally over the next 20 to 25 years (sometimes earlier in areas where oak is significantly older). The process has already begun, as this issue was identified years ago (hence one of the reasons to update the type).

Considering the current condition of red oak on the forest, the average age of mature stands, and the long term management potential of the type, the overall goal for regeneration will be around 400 acres per year over the next 20 to 25 years. This will provide better regulation of the red oak resource, yield a more uniform flow of forest products, generate a more even distribution of age classes over the landscape (which will also maintain structural diversity and produce more diverse wildlife habitat), and create a more balanced work load, both short and long term.

As part of the update process, stands were prioritized based on age, quality, species diversity (whether there was a significant component of over mature aspen or birch), previous management

(if any), etc. Furthermore, stands were ranked based on the potential or likelihood of maintaining (regenerating) the red oak component, as well as the density of overmature aspen and/or paper birch.

For a variety of reasons, red oak can be one of the most challenging timber types to regenerate (further described below). Understanding how these current stands were established (the stands we are managing today) can reveal some of the challenges we face today.

Most of the red oak stands we are managing today originated during the period of the last big cutover (early 1900's). Back then, stands were basically clearcut, with little (if any) regard to resource damage, best management practices for water quality (or anything for that matter) or slash control. Soil scarification was extensive, as was logging debris. Then the fires came. The result, extensively scarified sites, exposing a large percentage of bare mineral soil, with little to no competing vegetation, no mature overstory trees, and very little impact from animals that love to nibble on acorns or freshly regenerating seedlings i.e. deer or hare (there wasn't much for regulation back then and homesteaders needed to eat too).

Red oak, being a fire tolerant species, is built for this exact scenario. It needs relatively bare mineral soil, a good amount of sunlight, little competition from other tree species, and minimal predation or browse pressure. While the intensive fires killed much of the competing vegetation, it only temporarily impacted the red oak. Carbs stored in the root system afforded it the luxury of rapidly developing after the fire. Newly germinating acorns were established under ideal growing conditions. Many new red oak seedlings rapidly and aggressively attained dominance, well before other tree species were able to re-establish. The result: a dense stand of red oak, oftentimes with only minor components of paper birch, aspen, red maple, white pine, red pine and, on better sites, sugar maple.

Fast forward to today. Much emphasis is placed on the suppression of wildfires with the goal of reducing or eliminating its potentially devastating impacts. While prescribed fire is still commonly used today as a management tool to facilitate the regeneration of oak, the scale and intensity of previous (historical) stand initiating fires will never be duplicated (and results of prescribed fires are oftentimes unreliable and difficult to predict).

Deer densities (and other seedling or acorn predators), by design, are currently much larger than 100 years ago and have the potential to completely wipe out any red oak regeneration attempt. Stands of oak are generally all the same age (either mature, between 90 to 100 years of age, or approaching maturity), meaning most stands originated during a period when deer densities were very low and oak sprouting potential and acorn viability (both critically important in the development of new oak stands) will only continue to decrease. Current harvesting methods and management practices result in a lighter footprint on the landscape, meaning scarification isn't as intensive and mineral soil is less exposed.

Methods of regeneration have also evolved over time. All are geared towards manipulating light and competition. Red oak is classified as intermediate in shade tolerance. Generally speaking, this means that the intensity of sunlight is a critical factor influencing initial seedling survival, as well as subsequent annual growth and development. Silvicultural techniques such as shelterwood, seed tree and clearcut are all used in attempts to regenerate new stands of red oak (in part, with the goal of manipulating levels of sunlight able to reach the forest floor).

Some methods, like the shelterwood, leave a few more trees, equally distributed, on the landscape, with the goal of establishing and tending the new crop of trees before eventually removing most of the overstory (to release the advanced regeneration). Other methods, like the seed tree, leave fewer trees, still equally distributed on the landscape, with the goal of providing even more light and resources available for new seedlings.

Seed tree methods also typically leave the remaining mature trees in place (meaning we don't come back in to remove them), thus reducing damage to newly developing and recruiting seedlings, which would inevitably occur during the removal of the overstory. Clearcut methods are the most intensive, often removing most of the overstory and heavily relying on the subsequent flush of regeneration to establish the next stand. Each method has its pros and cons and all are used on the forest when attempting to regenerate red oak, with the Department currently experiencing greater success with more intensive harvests.

Regardless of the regeneration method, other components required to successfully develop a new stand of red oak still need to be considered i.e. competition control, soil scarification, herbivory control, acorn dispersal and viability, site potential, and sprouting potential, etc. If competing vegetation is a concern, some stands are scarified with a dozer and straight blade in an attempt to knock back undesirable tree species and expose mineral soil. Anchor chains, salmon blades or other implements are also used as a means to scarify soil and reduce competing vegetation. Prescribed fire can also be used to control unwanted vegetation. Timing of acorn dispersal and quantity (and quality) of acorn production are also critical, but much more difficult to predict and control.

When determining where to invest additional inputs in the management of red oak, all of the above mentioned factors need to be considered, as does site quality and location. Some stands on higher quality sites will receive intense pressure from red and sugar maple (and ironwood), which, inherently, makes it more difficult to establish a new stand of red oak. They also tend to occur on rugged locales, making it difficult to stage and maneuver heavy equipment or administer a prescribed fire.

Many of these stands may be better suited as moderate quality northern hardwoods, with a minor component of red oak (i.e. more maple and less oak). The general management direction in this scenario may be to lightly thin, incorporate large gaps or groups and allow the stand to naturally convert to northern hardwood, again, with a lesser component of oak.

On the other end of the spectrum, red oak stands growing on lower quality sites tend to be associated with heavier components of aspen, birch and pine. Competition from red and sugar maple (and ironwood) are also often less intensive, thus providing a more favorable environment for red oak regeneration. However, these sites are generally less productive, resulting in growth and development that tends to be on the lower end of the range. Managing these stands with a goal of increasing the component of aspen, birch or pine may be seriously considered.

In general, maintaining as much red oak as possible is a priority for the Department. However, a considerable amount of emphasis will be placed on sites of medium quality, where oak production and quality (or potential) is good, competition from other tree seedlings is lower, and additional inputs from the Department, if needed, are the most effective.

- The goal in 2018 will be to regenerate approximately 395 acres of red oak (which is nearly identical to the 2017 goal of 400 acres). Whenever possible (or practical), an emphasis will be placed on maintaining stands as red oak. In addition, approximately 160 acres will be thinned and 240 acres will receive an overstory removal (harvesting most of the remaining overstory trees from a previous shelterwood prescription). Overstory removals will only occur if the Department has determined that the stand has successfully regenerated with desirable tree species.

Aspen:

At nearly 78,000 acres, aspen is, by far, the largest single cover type on the county forest (roughly 45% of the entire forest). Similar to the issue with red oak, a significant portion of the aspen type occurs within a relatively narrow age class window. Nearly 55% of the aspen type is between 25 and 45 years of age, with an additional 20% greater than 45 years old. Ultimately, to address the relatively large wave of aspen soon to reach maturity, the Department needs to make minor adjustments to the management approach for this type.

The management and regulation of the aspen type is pretty straight forward. Under ideal conditions, and assuming an equal distribution of age classes, the sustainable harvest goal for aspen is essentially calculated by dividing the total acreage by the rotation age. The rotation for aspen varies by location and site quality, but generally is between 50 and 55 years of age (sometimes longer on the highest quality sites or shorter on poorer sites). When considering just the raw numbers, if the average rotation age were around 52 years (and it is), the optimal sustainable harvest goal for aspen would be approximately 1,500 acres per year.

When calculating the long and short term sustainable management goals for the aspen type (as is done with all other forest types), all data is analyzed by location (IRMU – Integrated Resource Management Unit). Each unit (IRMU) represents a general area of the forest. Each area contains slightly different growing conditions and influences.

Within each IRMU, current age class distributions, site quality, previous management (or stands excluded from management), recommended forester prescriptions, etc., are all weighted and analyzed when determining the harvest goal per unit. Current age class distributions are charted against desired distributions to determine if additional adjustments to the management strategies are needed. In some cases, like those we are experiencing now, the Department needs to enter stands a little sooner (i.e. as early as 40 years old), in order to better distribute age classes on the landscape and avoid similar problems in the future.

In order to spread this narrow band of age classes out and realize a more evenly distributed condition, we need to harvest some stands sooner than normal. These adjustments will produce similar benefits as addressed in the red oak section, including a more regulated distribution of aspen on the landscape. When fully regulated (and when all stands excluded from future management are removed from consideration), the sustainable harvest goal for aspen will be about 1,450 to 1,500 acres per year.

- The 2018 sustainable harvest goal for aspen is 1,420. This represents an increase of 45 acres (roughly 3%) when compared to the goal for 2017. Again, the small increases are generally

due to the Department addressing the large acreage band of relatively narrow age class distributions looming on the not so distant horizon.

It's worth noting that the aspen type, particularly trembling aspen, is predicted to be one of the more negatively impacted forested communities, when modelled against a potentially warming climate. With roughly 45% of the ownership comprised of the aspen type, that is a concern.

At greatest potential risk would be stands currently developing on sites of poor quality (where nutrients and/or moisture are most limited and trees are inherently stressed). Aspen developing on dry to very dry sites or sites that are overly wet, would be the most at risk. Another goal for 2018 will be to develop a process or direction to analyze stands most susceptible, if climate change models are correct, and flesh out future management strategies and goals.

Since predicted warming climate related impacts are expected to be decades away, any modifications to management would most likely occur well into the future (when the youngest stands approach maturity). Still, having the discussion now will allow us to be better prepared, especially if predictions hold true.

Total Sustainable Harvest Goal:

Table 1 displays the sustainable timber harvest goal (acres) per primary timber type for 2018 The goal for 2017 is also included for comparison:

Table 1: Sustainable Timber Harvest Goal (acres)

Timber Type	2017	2018
Aspen	1,375	1,420
Northern Hardwood	890	720
Red Oak	900	795
Paper Birch	30	25
Scrub Oak	215	255
Red Pine	915	930
Jack Pine	345	192
White Pine	90	80
Swamp Conifer	140	100
Swamp Hardwood	100	120
Fir/Spruce	30	25
Total	5,030	4,642

As previously stated, one of the primary objectives in managing the forest is to strive for a regulated, even flow of harvests, equally distributed over the landscape. However, sustainable harvest goals typically fluctuate slightly from year to year. Most fluctuations are explained by the natural irregular distribution of age classes over the entire forest and, subsequently, when they are ready for management.

Among other things, fluctuations are also a result of a change in management direction for individual timber types, responses to natural disturbances or other unforeseen natural events, a relatively poor response in growth from previous management, modifications in response to accomplishments from the previous year or land acquisition.

Again, during the season, the harvest goal may be adjusted for a variety of reasons, i.e. response to unanticipated natural events or significant changes in reconnaissance data or as otherwise stated above.

On the Bayfield County Forest, the primary annual differences in sustainable harvest goals are a result of a variety of factors, some of which include: improved reconnaissance information, a significant increase in the number of stands reaching management age (particularly in the aspen, red oak and red pine types), the inclusion of harvest goals for the swamp hardwood and swamp conifer timber types (types that were excluded from consideration in the past), adjustments in the management approaches of the aspen, red oak and northern hardwood timber types, and general modifications as a result of stand level responses to previous treatments.

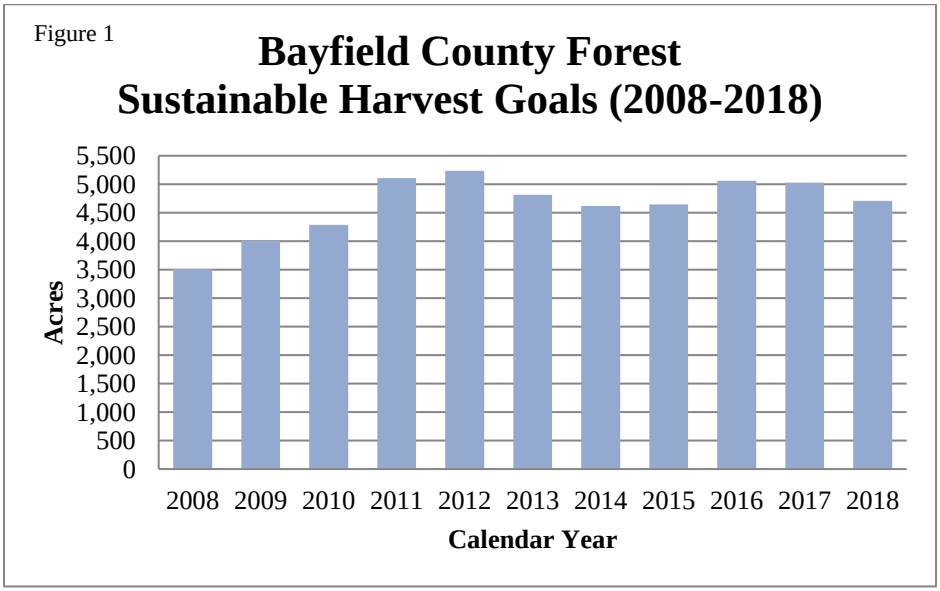
In 2015, the county purchased 1,855 acres of industrial forest lands with the assistance of the Knowles Nelson Stewardship grant. The county also included 747 acres of county owned, non-county forest lands, as a match. In total, 2,602 acres were added to the county forest program. These acres will naturally provide an increase in harvest levels, particularly in the red pine type.

In 2016 (actually completed in 2017), the county purchased another 200 acres of land previously owned by the Wisconsin DNR. Over the past two years, the county has added about 2,800 acres to the county forest. Much of this land has immediate management potential and will have a modest impact on short and long term sustainable harvest goals.

Since 2006, the sustainable harvest goal has increased by approximately 50%; from 3,134 acres to 4,707 acres in 2018.

Figure 1 displays the total sustainable harvest goals over the last eleven years (since 2008).

Figure 1



Over the past decade, the sustainable harvest goal has changed significantly. The peak harvest goal was in 2012, with a target of 5,238 acres. This was primarily due to the addition of numerous older, backlogged stands. Now that many of the backlogged stands have been managed, the annual sustainable harvest goal should hover between roughly 4,500 and 5,000 acres per year.

Maximizing the sustainable management of the county forest was a primary goal heading into calendar year 2011. As displayed in Figure 1, the average sustainable harvest goal from 2011 through 2017 increased by over 1,250 acres per year, when compared to the average goals from 2006 through 2010.

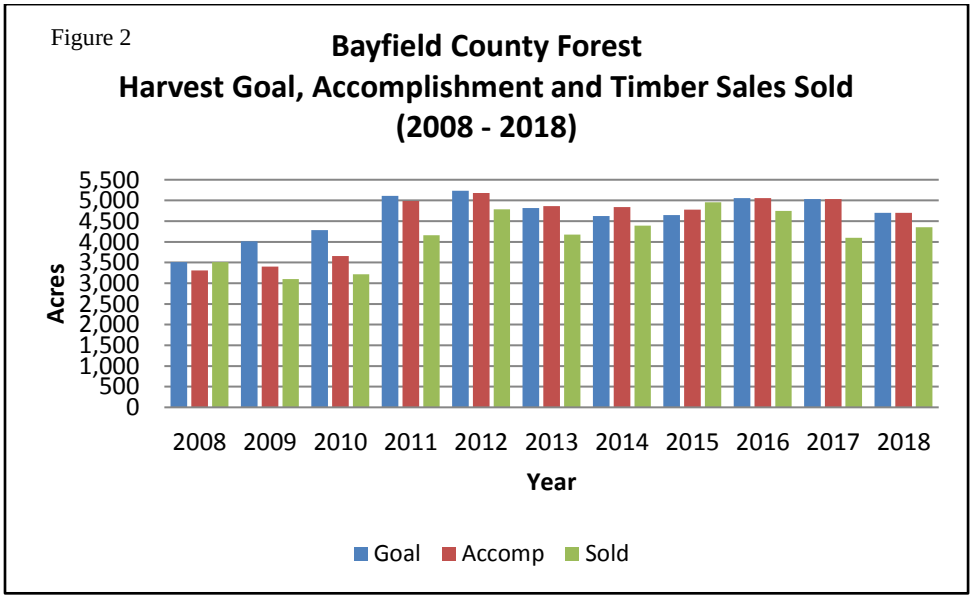
The significant increase in the sustainable timber harvest targets created a substantial increase in the amount of time required to successfully accomplish the goal. In addition, numerous other forest management responsibilities increased over the same time period creating a significant deficit in time required to accomplish both annual and long term goals.

To address the deficit, one full time forester position was added to the staff in early 2011. The impact of the additional forester was immediate (see Figures 2 and 3 below). In addition, a recreation forester position was created in 2013. Initially, roughly 20% of this position's workload was dedicated towards various forestry related activities.

However, as the recreational footprint of the Department and subsequent responsibilities have increased significantly over the past few years, the amount of time this position has to dedicate towards forestry activities is almost nil.

Figure 2 displays the annual sustainable harvest goal, accomplishment and sold timber sales from 2008 through 2018 (2017 and 2018 are estimates):

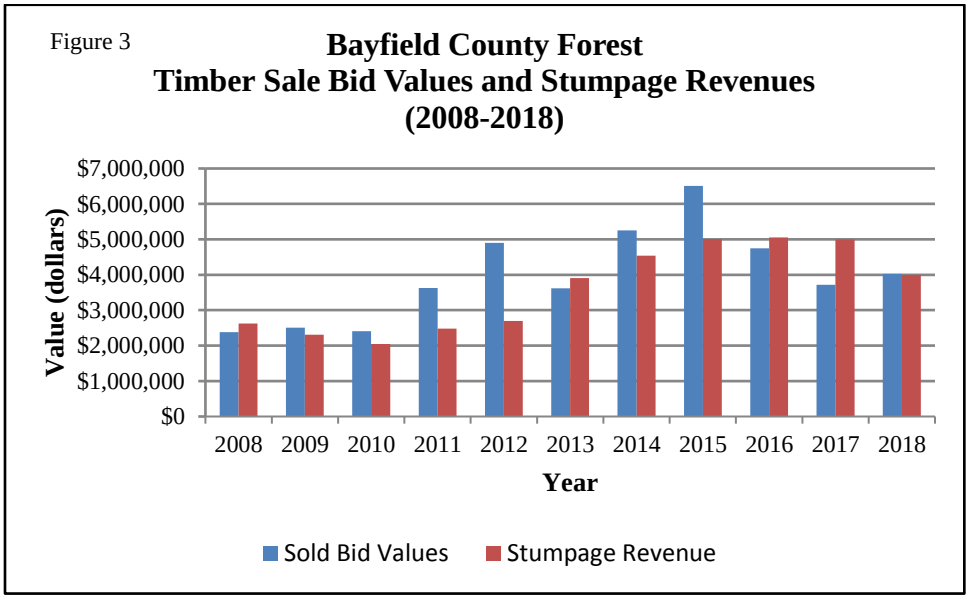
Figure 2



Prior to 2011, the Department averaged 45 timber sales, covering 3,044 acres per year. The average total winning bid value for those sales was approximately $2.36 million. Since 2011, the Department has averaged 57 sales, covering just over 4,500 acres. During that time, the average total winning bid values have basically doubled, to over $4.62 million. The total winning bid values peaked in 2015, at just over $6.5 million!

Figure 3 displays the total sold value of timber sales and actual revenues from stumpage (harvested timber) from 2008 through 2018 (2018 is a conservative estimate):

Figure 3



Bayfield County has generated roughly $5.0 million in total stumpage revenue in each of the last three years (2015, 2016 and 2017), which is a stark contrast to the average $2.285 million collected between 2007 and 2010. However, this trend is not expected to continue. Total sold timber sale values have decreased significantly since the peak in 2015. The average total sold timber sale values were roughly $5.5 million between 2014 through 2016. The total sold value for 2017 was approximately $3.72 million, a decrease of nearly $1.8 million (or roughly 32%).

General Information of Timber Sale Revenues

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 2018 will come from sales sold in 2018 (which is an unknown); 45% from sales sold in 2017; 20% from sales sold in 2016; 10% from sales sold in 2015 and the rest from 2014 and 2013.

In essence, markets and weather conditions are primary drivers of timber sale activity, both of which are extremely difficult to predict.

Referring to Figure 3, the banner stumpage revenues received by the Department in calendar years 2015, 2016 and 2017 were, in part, a result of very strong markets from the year's prior (timber sale bid values were at an all-time high in 2015). CY 2017 was a poor market comparatively. As a result, and assuming an average or slightly better market in 2018, the general prediction is a significant decrease in sale of wood revenues for 2018, by as much as 20 to 30%.

Township Payments

Ten percent of the total stumpage revenues generated from the county forest are distributed to Townships that contain county forest land. Distribution is prorated and based solely upon the total amount (percentage) of acres located within each Town. In 2017, that total amount is predicted to be around $500,000 (based on a stumpage revenue stream of approximately $5.0 million). Prior to 2013, towns received an average annual total payment of roughly $220,000. In addition to the mandated 10% stumpage payment, towns also receive an annual PILT payment (payment in lieu of taxes) from the state, at a rate of $0.30 per acre.

For 2018, the budgeted 10% payment to the Town is set at $323,000 (based on a stumpage revenue budget of $3.23 million).

Maximizing the sustainable harvest of the forest has numerous benefits. Not only does it have the potential to significantly increase revenues, but it also supports numerous local jobs, fosters new job growth, provides additional recreational opportunities, provides exceptionally well managed products to local wood industries, improves forest health and productivity, protects water quality and creates/maintains a diversity of wildlife habitat.

More Sustainable Harvest Information and Green Tree Retention

During the timber sale establishment process, scheduled stands are examined to determine if they are indeed ready for management. Traditionally, some aren't, leading to approximately 5 to 10% of the sustainable harvest goal being removed from management consideration.

In general, some stands either aren't ready for management, are typed incorrectly or are removed from future management consideration for another reason i.e. riparian/wetland protection, steep or inoperable slopes, special, rare or unique features, etc. Stands that simply aren't ready for treatment are re-scheduled for future management. Stands that are used to protect wetlands and other riparian, sensitive, unique, or special features are permanently removed from future harvest consideration.

- After removing approximately 5 to 10% from harvest consideration, the long term net sustainable harvest goal (actual timber sale establishment) will range between roughly 4,000 to 4,500 acres per year. Based on the sustainable harvest goal for 2018, the expectation is that approximately 4,300 to 4,400 acres will be ready for management, which equates to about 2.5% of the forest. Over the long term, when only considering the net sustainable

harvest goal, management (in the form of a timber sale) will occur on roughly 2.3% to 2.6% of the forest per year.

Additionally, as part of the timber sale process, a representative portion of most stands are purposely left unmanaged, termed green tree retention (also called legacy tree, reserve tree, etc). This can be accomplished by leaving individual trees or small patches (remnants) of the previous stand or a combination of the two. Green tree retention can also be incorporated as part of other reasons to leave stands unmanaged i.e. BMP's for water quality, unique/special features or aesthetic considerations.

- The goal for green tree retention is to reserve roughly 3 to 10%, of the original stand area, as unmanaged, scattered individual trees or remnant small patches, on each timber sale.

However, due to the nature of some stands or forested communities, green tree retention is not always considered or feasible. For example, jack pine stands/barrens require intensive management to maintain. Remnants of older trees provide vectors for insect or disease outbreaks that can be devastating to newly developing stands. For that reason, green tree retention is not applied wherever threats to young regenerating stands exist (primarily jack or red pine) or when the regeneration of target species would otherwise be compromised.

The retention of reserve trees (or green tree) can provide numerous benefits, all of which ultimately contribute to the conservation of biological diversity. Among other benefits, these structures facilitate the perpetuation of some biota (plant and animal species and genotypes) on site. They can maintain landscape connectivity by enabling the movement of some organisms. Reserve trees also influence reorganization and recovery processes after a timber sale, as well as help to sustain functional roles and modify the post disturbance environment.

Green tree retention in stands that required significant amounts of riparian protection can add up to be substantially greater than the upper threshold of 10%. It's fairly common to see retention levels at 25% or greater in stands with heavy riparian protection measures. Finally, green tree retention really only applies to stands that are managed with more intensive even aged practices i.e. clearcutting, seed tree harvesting, etc. Stands that are thinned, already leave behind more trees than those that are harvested. Of the 2.3% to 2.6% of the forest that is managed over the course of a year, roughly 55% is managed with more intensive even aged harvests.

It's worth noting that a substantial portion of the forest has already been removed from future timber management consideration. Roughly 11,000 acres, or about 6% of the forest, have been designated and removed from the scheduling process. The reasons for removal are numerous, many of which having been previously mentioned, and primarily include: riparian/wetland protection; conservation of rare or unique landscapes (i.e. Glacial Kettles and Shultz Swamp); and protection of sensitive slopes (primarily in the clay plain).

It should also be noted that, regardless of market conditions or budget shortcomings (or anything for that matter), the sustainable harvest goals have never been, nor ever will be, artificially inflated or adjusted. Quite simply, it is what it is, all based on sound data and science.

Timber Sale Administration

Since 2011, the Department has sold an average of 57 new sales every year (covering about 4,500 acres per year). This number has ranged from a low of 53 sales in 2012 and 2017 (though still covering an average of 4,500 acres) to a high of 64 sales in 2016 (which covered nearly 4,800 acres). Timber sales are sold on a two-year contract. Extensions may also be granted, which can extend a contract up to a period of four years (and, in some cases, longer).

Depending on the sale restrictions of the contract, markets, seasonal conditions, etc., a contractor can choose to go active on a timber sale at virtually any time throughout a given year. Once a timber sale goes active (actually slightly before), the Department immediately begins the administration process.

Timber sale administration is a critically important facet of any forest management program, as it serves to ensure field operations are in compliance with the contract and accomplishing the goals of the sale. On a routine and regular basis (from the start of the contract to the end), Department staff work directly with timber harvesting contractors on all facets of the sale, including, but not limiting to: timber sale contract review, harvesting parameters and restrictions, goals of the timber sale, road and skid trail layout, recreational concerns (if any present), Best Management Practices for Water Quality, monitoring of sale progress, tracking and scaling of harvested timber, etc. As part of the process, if any issues or concerns arise, they are dealt with promptly, as per the contract.

A total of 60 timber sales were active in 2017 (down slightly from the 74 that were active in 2016). Activity can be highly variable and may include, but not limited to: timber harvesting, forwarding, scaling, hauling, summarizing mill slips/scales, making stumpage payments or timber sale close-out actions (i.e. road work, final inspections, site repairs, etc).

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 2017, the Department has 130 timber sales under contract, with 33 different contractors and a total contract value of nearly $11.5 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.

The Assistant Administrator assumes the lead role in the administration of all active timber sales. When activity ramps up, Department foresters and the DNR will provide some assistance.

FOREST INVENTORY

Correct, up-to-date stand information is imperative in the development of accurate short and long term sustainable harvest goals. There is a direct correlation between the quality and accuracy of the reconnaissance data and the ability for forest managers to confidently develop precise 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 2 summarizes the inventory goal (compartment and stands) and actual accomplishments since 2008 (accomplishments for 2017 and 2018 are estimated):

Table 2: 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
2017	12,500	12,500
2018	12,500	12,500
Average	11,545	9,339

Starting in 2014, the Department began an emphasis on updating select individual cover types rather than entire compartments, though a few compartments were still reviewed. In 2014, the two major cover types targeted for update were mature stands of red oak and mature stands of jack pine. One primary goal of re-inventory was to develop a system to better prioritize the future management of these two types.

In 2015 and 2016, the target species was the remaining stands of mature red oak (and developing strategies/plans for northern hardwood), for similar reasons. In total, approximately 2,600 acres of mature jack pine was re-inventoried in 2014 and approximately 9,000 acres of red oak (all mature stands) were re-inventoried between late 2014 and early 2016.

In 2017, the emphasis was placed on stands of northern hardwood. Site quality, and, subsequently, stand quality are highly variable within the northern hardwood type. As previously stated, the prescription applied to nearly every stand of northern hardwoods, by default, has been all-aged management (individual tree selection). While this prescription is often applied over much of the cover type, it is arguably not sustainable on many of the low end moderate, and nearly all of the poor quality sites.

Northern hardwood re-inventory will continue in 2018. The overall goal of re-inventory is to better capture site and stand quality as part of the silvicultural prescription. Accurate data that, in part, incorporates site/habitat quality, growth potential and responses to previous management is an essential part of the prescription development process.

Once the northern hardwood re-inventory is complete, it is anticipated that the total acreage slated for all-aged management will decrease slightly, with a small increase in even-aged management (especially on the poor to moderately poor quality sites). However, the use of group selection as an alternative to the traditional individual tree selection method may be applied on moderate to poor

quality sites. This will maintain a more uneven-aged structure and allow mature stands to perpetuate on the landscape (and maintain structural diversity).

Swamp hardwood will be the next forest type slated for re-inventory. Roughly 3,000 acres are currently typed as swamp hardwood. In Bayfield County, swamp hardwood primarily contains a mixture of black ash and red maple as the dominant types, with the former being the most prevalent.

One primary objective of re-inventory in swamp hardwoods will be to locate stands of high priority (for management). In part, these would be stands that contain significant levels of mature or over-mature aspen; those that have been previously un-managed and in need of treatment; or those exhibiting higher levels of mortality, crown die-back or disease. Another objective will be to determine the overall density of the ash component.

With the threat of Emerald Ash Borer looming (both Douglas and Sawyer counties have been quarantined), it's extremely important to locate all stands that have a significant ash component (particularly important in preparation for impending EAB infestations) and, subsequently, to develop short and long term plans/objectives for management.

Once the remaining stands of northern hardwood have been re-inventoried, the attention will shift to swamp hardwoods.

- The total update goal for 2018 will remain 12,500 acres. Of that, roughly half will be in the form of compartment updates. The remaining will be in the form of stand updates, primarily northern hardwood and swamp hardwood. Since 2001, 188 of 202 compartments, totaling 152,199 acres have been updated. The goal is to re-inventory the remaining 14 compartments over the next 2 to 3 years. Once completed, a 15 year, modified re-inventory cycle will be re-implemented.

When updating entire compartments, priorities will be placed on those that contain a larger percentage of old data (≥20 years old), as well as those that contain a larger percentage of stands prescribed for management in the near future.

Continuous Forest Inventory (CFI) and Forest Regeneration Metric (FRM) Programs

Starting in 2018, the Department will begin the development of a new long term forest monitoring program, termed continuous forest inventory (or CFI for short). As part of the program, a total of 670 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. The Wisconsin DNR will be providing some assistance in the establishment of the program, particularly in the early stages.

Establishing 670 permanent plots, county forest wide, 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. Establishing CFI plots at this level of intensity equates to about 1 plot for every 260 acres of forest land.

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.

Current reconnaissance or forest monitoring efforts provide a stable foundation, but information gleaned from CFI will take it to the next level. In addition, CFI will not replace the need to continue monitoring the forest on a stand or compartment level basis. However, CFI will cover a broader depth of forest attributes; will provide significantly greater analysis and reporting capabilities; and will supplement information obtained through annual and routine reconnaissance.

Forest regeneration sub-plots will also be incorporated as part of the CFI. The Department is currently in the process of implementing/fine tuning a system of forest regeneration monitoring, utilizing the WDNR Forest Regeneration Metric (FRM), on all stands that have received management, where regeneration is a primary goal (also in the process of developing a sub-sample for the aspen type). Regeneration data obtained from CFI will be used to supplement the already exhaustive FRM information that will be collected, by the Department, at the stand level.

Continuous forest inventory will also produce a wealth of information to assist in the planning and decision making processes (both short and long term). Factors and/or questions like annual volume growth per cover type, product and/or quality development, responses to forest management, extent of invasive species, impacts of insects and/or disease, impacts of climate change, etc., will all be attainable with the statistically sound information gleaned from CFI.

The goal is to establish all 670 plots over a two-year period (335 plots in both 2018 and 2019), as complete implementation in one year is unrealistic. Data collection will begin at year one (starting in 2018), with a goal of completing the initial data collection phase in three years (roughly 223 plots per year). Starting at year four, all plots would be placed on a five-year re-measurement schedule (roughly 134 plots per year).

A new position was created within the Department to, among other things, manage both the CFI and FRM programs. The position will start around the first of February 2018 and will be titled Inventory and Analysis Forester. In addition to managing the CFI and FRM programs, this position will also be charged with performing various analyses of the data; the management of various databases; the development of various summaries and reports; and numerous other field forestry related tasks.

REFORESTATION

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.

Table 3 summarizes the reforestation efforts since 2010. The values for 2010 – 2016 are actual, 2017 are estimated and 2018 are planned:

Table 3: Bayfield County Forest Reforestation Program Summary 2010 - 2018 (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	TSI[2]	Regen
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	0	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	523	275	0	200	295	0	0	68	60	4,500
Avg.	189	75	59	8	237	430	45	88	400	11	218	122	12	2,682

[1] *In 2011, tamarack and white spruce.*

[2] *Timber stand improvement.*

Spring Planting

The planting program has changed significantly since 2013. Between 2008 and 2013, an average of 350 acres of red pine, 210 acres of jack pine and 70 acres of white pine were planted every year. Since 2013, the average has been 110 acres of red pine, 10 acres of jack pine and 30 acres of white pine. In addition, prior to 2013, 0 acres of jack pine was artificially seeded. From 2013 through 2018, an average of over 350 acres of jack pine has been seeded per year.

The primary reasons for the changes in the reforestation program (planting and seeding) are as follows: 1) re-planting of the old fuel break areas has been completed. The last remaining piece scheduled to be reforested (144 acres) was seeded to jack pine in 2016; 2) a general lack of previously open areas, which, in the past, were planted to red pine; 3) a lack of mature red pine stands that are ready for regeneration; 4) movement towards primarily jack pine regeneration in the Barnes Barrens Management Area; 5) an emphasis on seeding when attempting to regenerate jack pine; and 6) much of the acreage planted during the early 2000's was in direct response to severe defoliation and subsequent mortality related to an outbreak of jack pine bud worm.

As mentioned above, one direction over the past decade plus was to reforest some of the previously established fuel breaks. The breaks were/are located in the barrens area, south of Iron River and north of Barnes. These breaks were approximately ¼ mile wide by a few miles long and were maintained as primarily open grasses. In theory, the breaks would provide a first level of defense if an intensive wild fire were to occur. Portions of the break still exist near the Potawatomi sub-division, but a majority of the breaks have now been reforested.

In total, roughly 1,300 acres of old fuel break have been reforested, primarily to red pine, but also

some to jack pine. Approximately 350 acres still exist near the sub-division. As part of the local wildfire mitigation plan, the Department now incorporates wider harvest corridors along road rights of way in an attempt to increase the defensible space (the goal is to maintain a grass or fuel free zone at least 50 feet in width on each side of a town road corridor). Also, an additional fuel break road (averaging 100 feet in width) was established between Barnes and Weldon roads, to provide another level of defense in an area where some private development exists.

In 2017, 36 acres were planted with containerized red pine, at a rate of roughly 800 seedlings per acre (with a total of approximately 30,000 seedlings). Two acres of jack was also planted with containerized stock, at similar densities.

In 2018, approximately 134 acres are scheduled to be planted with red pine. These sites will all be planted with containerized stock at rates of approximately 800 per acre (total of about 108,000 seedlings).

In the future, the general expectation is that red pine plantings will hover between 100 and 200 acres or less per year. White pine under plantings will vary, depending on the availability of suitable sites. While jack pine will be planted when it's determined to be more advantageous to do so (typically on sites of relatively small acreage, where seeding is more difficult or on sites that require more intensive site preparation due to excessive competition or other similar concern).

The Department will also continue to analyze red pine to determine if there is a need to begin regeneration harvests sooner, in an attempt to evenly distribute age classes over the landscape. If so, annual harvests, and subsequent reforestation levels, would be adjusted accordingly.

Spring Seeding

The seeding program also changed significantly over the past few years. Before 2013, the Department had generally moved away from artificial seeding. Starting in 2013, the Department began implementing objectives that were developed in the Barnes Barrens Management Plan. Among other things, the plan identifies a preference to regenerate a jack pine dominated landscape (within the Barrens area), with artificial seeding as the preferred reforestation method. Seeding is preferred primarily because of the potential to create a more naturally regenerating landscape (higher levels of variability and diversity).

Before a site is seeded it needs to be mechanically prepped and usually sprayed. This provides a better seedbed for the delicate jack pine seed to germinate and develop. Also, adequate acreage needs to be available before local contractors are interested in the work. Many of the acres that were trenched in 2016 were also sprayed in 2017. These sites would then be seeded in 2018.

The timing of timber harvests also has a direct impact on how many acres will be available for reforestation. As previously stated, timber sales are sold under two year contracts. The contractor can request up to two - one year extensions (meaning it can take up to four years to complete the sale).

In 2018, approximately 483 acres will be seeded with jack pine and 40 acres with a mixture of white pine and white spruce (523 acres total), using a total of about 131 pounds of seed (seeded at a rate

of roughly 4 ounces per acre). All jack pine seeding will occur in the Barnes Barrens area, while the white pine and spruce will be added to a poor quality stand of previously managed northern hardwoods in the Barnes, in an attempt to increase species diversity (at very little cost). This will mark the first attempt at direct seeding white pine and/or white spruce from an airplane. As per routine practice, the site will be monitored regularly to determine success. Generally speaking, all seeding is accomplished aerially, in coordination with DNR aircraft and pilots.

Site Preparation

In 2018, approximately 275 acres are planned for site preparation via power trenching, 295 acres will be treated with chemical and 0 acres will be fire plowed.

Site preparation goals reflect the amount of known sales that have been completed within the past year (and are in need of site prep). Occasionally, a few more timber sales are completed in time for addition to site prep goals. When that happens, the goal is adjusted accordingly, as budgets allow.

In addition, approximately 200 acres of red oak, paper birch and/or northern hardwoods will be scarified, usually with a dozer and straight blade. Scarification will facilitate the natural regeneration of red oak and paper birch, as well as reduce competition from non-desirable species, such as ironwood and, in some stands, red maple. This work is generally accomplished by DNR staff, with DNR equipment. If fire plow sites become available in 2018, there may be some additional acres treated, again, as budgets allow.

Release

On occasion, young regenerating stands, whether reforested naturally or with artificial means, need a little assistance. Competition from other trees or vegetation can significantly reduce growth rates, negatively impact species density and diversity, and, in some cases, if not treated, result in partial or complete failure of the reforestation activity. As part of the routine and regular monitoring program, stands are examined to determine if additional inputs by the Department are needed to help with development (if needed, the activity is generally termed release).

In general, the Department has used three different forms of competition control, or release, to help achieve desired stand objectives: spraying (use of chemicals), timber stand improvement, or TSI, which uses hand held power tools (i.e. brush saws, chainsaws, etc.) or prescribed fire.

Spraying is most common when treating plantations, generally red pine, and is prescribed on an as needed basis. Occasionally, young plantations need treatment in order to release seedlings from undesirable vegetative competition. This release can significantly increase seedling growth and improve the rate of survival. In 2018, it is anticipated to 0 acres will be treated for release. However, through routine and regular monitoring, a few stands may be determined to require release. If so, these stands will be treated as budgets allow.

The prescribed burn program, for the regeneration and/or maintenance of specific timber types (typically red oak), is still under review to gauge the effectiveness of fire. As a result, 0 acres will be burned in 2018, though the DNR still maintains portions of the fuel break via prescribed fire.

Currently, roughly 190 acres of existing fuel break, along Blue Lake and Island Lake roads, in the Town of Barnes, is scheduled for maintenance via prescribed fire. This work is accomplished by the DNR with DNR staff and equipment. Department staff may provide some assistance with prescribed burning.

Timber stand improvement may also be prescribed on regenerating stands in need of maintenance. In 2017, 46 acres of northern hardwood stands were treated with brush saws to release desirable regeneration. This marked the first time the Department used contract crews to treat a regenerating stand. In these northern hardwood stands, undesirable species (primarily ironwood) were severed to release the more desirable maple, red oak and birch. Failure to do so has the potential to significantly decrease species diversity, reduce the growth and development of desirable tree species, and negatively impact the future production of the stand.

In 2018, approximately 60 acres of northern hardwoods and/or red oak will be treated with contract TSI crews. The goals will be similar i.e. targeting the removal of dense ironwood to release desirable tree species. Routine and regular monitoring may reveal additional stands in need of treatment. If so, these stands will be managed as budgets allow.

In the future, it is anticipated that TSI will become more routine and will be required to improve the growth potential and survival of desired regeneration in many previously managed hardwood stands i.e. northern hardwoods, red oak, birch, etc., as well as some conifer stands (primarily white pine under plantings). Other forms of mechanical release are also constantly being explored (i.e. mowing, dozer and straight blade, etc.) and may be prescribed if deemed feasible, as budgets allow. CFI and FRM will help to reveal the extent to which TSI will be required, as well as to monitor the impacts/results of previous treatments.

Seedling Protection

Starting in 2013, the Department used bud caps to protect young jack pine seedlings from browsing by white tailed deer. In total, 239 acres were bud capped. This literally involves stapling a 3”x 3” piece of copy paper over the terminal bud/leader of each planted seedling. The reason: plantation monitoring in this area has shown signs of excessive deer browsing. Failure to protect the seedlings could lead to plantation failure. Bud capping would need to be repeated every year until the seedlings are beyond the reach of the deer, which typically takes 3 or 4 years. Currently, the focus is on stands that are planted with containerized jack pine (as these seedlings are a little more nutrient rich when compared to bare root stock or natural regeneration).

These same stands were capped in 2014, 2015 and 2016. A few stands reached the desired height and were removed from capping in 2017. As a result, only 71 acres were capped in 2017. A similar amount of acreage will be capped in 2018. The bud capping goal for 2018 is 68 acres.

Because most of the jack pine in the future will be regenerated via seed, bud capping will most likely only be used when absolutely necessary, and mostly on jack pine stands that were planted with containerized stock. However, regeneration is monitored on a routine and regular basis. If plantations of red pine or underplantings of white pine or other similar reforestation attempts are experiencing similar browsing issues/pressures, these stands may also be bud capped, as budgets allow.

The Department also maintains two large scale deer exclusion fences on the forest. Both were 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 attainted dominance.

A few smaller scale fences (less than ¼ acre in size) 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. As we monitor regeneration in stands of northern hardwoods (and red oak), small exclusion fencing may also be installed around canopy gaps as a way to monitor regeneration and potential browsing impacts. This will occur as time and budgets allow.

Natural Regeneration

The majority of stands managed by the Department regenerate naturally i.e. they do not require site preparation, planting or seeding in the reforestation process. In 2018, thousands of acres, across a variety of forest types, will be naturally regenerated. The exact amount is solely dependent on the total number of acres previously harvested.

Forest types such as northern hardwoods and aspen regenerate naturally via seed, stump sprouting and/or coppicing (vegetative sprouting from existing root system) and require very little additional input from the Department. However, the natural regeneration of hardwood forest types such as red oak and paper birch often require additional Departmental maintenance efforts.

As previously stated, reforestation can be accomplished by either natural or artificial means. Table 3 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.). Subsequently, most of the monitoring listed in Table 3 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).

Examples of additional inputs to aid in the natural regeneration process include: pre or post sale site scarification to prepare a favorable seed bed and reduce competition, pre or post sale burning, TSI to reduce competition from undesirable tree seedlings and/or prepare favorable seedbeds, and deer browse protection i.e. fencing, repellents, etc. to improve the tree seedlings chance of survival. These additional inputs occur when issues or opportunities arise and are treated on a case by case basis, as budgets allow.

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 the higher quality stems left behind. 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 also 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 dominated by sugar maple and basswood, and sometimes with components of yellow birch) can be managed with even or un-even aged techniques. Maple isn't as unpredictable 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 northern hardwood sites, competition from ironwood has been a growing concern. Deer exacerbate this problem, 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.

Poor/slow growth rates on the residual trees, and inadequate recruitment of regeneration into the overstory, are also significant concerns on these lower quality sites. 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 (i.e. site preparation or TSI).

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. However, a subset of aspen sites, developing throughout all habitat types (poor to high), will also be part of the regeneration monitoring process.

For every stand, when a management prescription is developed, goals/plans for reforestation or regeneration are included as well. How a stand will regenerate is a critical facet of the process (more precisely, a mandatory part of the process). As part of the forest management prescription, reforestation is basically categorized or classified 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 3a summarizes the general management or reforestation goals for every completed (closed out) sale from 2011 through 2017 (total sales sold are also included). An important distinction between Tables 3 and 3a: Table 3 summarizes the actual reforestation activity that was physically accomplished per year; while Table 3a summarizes the planned reforestation activity that will occur in the future, once a timber sale has been closed out (which may take multiple years to fully realize).

Table 3a: Summary of Reforestation Activities on Completed Timber Sales (acres)

Year	Natural Reforestation[1]	Artificial Reforestation[2]	Thinnings[3]	Total Completed Sales[4]	Total Sales Sold
2010	1,404	364	486	2,254	3,218
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	2,146	180	943	3,269	4,750
2017	1,721	558	753	3,032	4,101
Average	2,053	528	879	3,460	4,316

[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 encompase stands that were treated with all-aged management (where portions of a stand will regenerate naturally), as well as intermediate harvests, where stands are eventually reforested at a specific rotation age (either naturally or artificially).*

[4] *Timber sales that have been completed or closed-out with the calendar year.*

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 3a, the acres of completed sales are highly variable, ranging from a low of 2,254 in 2010 to a high of 4,821 in 2014. However, acreage of sold timber sales remains relatively constant, as have stumpage revenues, which have hovered around $5.0 million in each of the last three years (2015, 2016 and 2017).

Of the completed sales, since 2010, a vast majority are regenerated naturally, with an average of over 2,050 acres per year. An average of 528 acres are reforested artificially and 879 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.

Seedling Counts (including the Forest Regeneration Metric)

All planted and seeded sites and many areas that were regenerated naturally require survival or regeneration counts. Monitoring the development of newly regenerating stands is an integral part of the reforestation process. Data collected from the counts are used to assess the development of the stand in a variety of ways, some of which include: determine stocking levels of desired tree species; survival and quality of regenerating seedlings; degree/intensity of undesirable competition; existence of insects and/or disease, and, if present, extent of threats/impacts to the stand; impact of herbivory, if present; and anything else of note. All of which provides valuable information when determining the effectiveness of the reforestation activity, if any additional inputs by the Department will be required to achieve the desired future condition and the next management prescription for the stand.

Seedling counts are generally administered at one, two, three, five and/or ten years, or some combination thereof, after the regeneration activity on most planted and seeded sites. Seedling counts on naturally regenerating hardwood stands are typically administered two to four years after harvest (depending on the forest type) and also include one to two additional surveys to determine success. Some stands may receive additional monitoring after 10 years of age, especially if issues are discovered or if stands aren't responding to treatment.

Over the past few years, the Department has work closely with the WDNR in the development of a Forest Regeneration Metric (FRM), primarily for the assessment of sites regenerating naturally (primarily hardwoods). The metric was established, in part, to develop general survey methodology designed to assess natural regeneration by seedling and sapling size classes, thus providing a better, more scientific way to quantify results and discover/address potential issues.

Not unique to Bayfield County, the WDNR created the metric to be utilized by all foresters as an additional measure during routine stand assessments. This type of metric can be used to characterize and quantify stand-level regeneration or be used in multiple stands to distinguish reforestation efforts by cover type on a county, regional, or statewide scale. If adopted by multiple

agencies, it will also provide an opportunity to analyze regional trends, across ownerships, by providing a framework that allows for direct comparisons of data.

Another primary responsibility of the newly created Inventory and Analysis Forester will be to develop, establish and implement a forest wide regeneration monitoring program utilizing the FRM methodology. Work has already begun on stands of northern hardwood, red oak, and paper birch, but the goal will be to expand monitoring to all stands, throughout all forest types. In addition to northern hardwoods, red oak, and birch, this will include monitoring aspen, scrub oak, swamp hardwoods, swamp conifer, and any other stand that will be regenerated naturally.

The sampling of every stand of regenerating aspen is neither practical, nor feasible. As previously stated, much of the initial focus will be on stands regenerating on nutrient limiting soils, either very dry or wet. Sampling protocols for aspen will be established in 2018, with the goal of monitoring a representative cross-section of stands developing on every general location/habitat type.

- In 2018, seedling counts will be administered on approximately 4,500 acres. Roughly 1,300 acres of sites that were regenerated artificially (planted or seeded); and roughly 3,200 acres of sites regenerated naturally. Because the regeneration monitoring program is being re-developed and expanded, utilizing FRM, the goal may fluctuate accordingly.

In addition to determining the general success of the reforestation activity, other specific goals of regeneration monitoring will include, but not be limited to: identifying stands that may require additional inputs i.e. mechanical scarification, TSI, prescribed fire, etc.; more intensive observation on cover types that are typically difficult to regenerate i.e. red oak, paper birch, as well as stands where competition from undesirable species has traditionally been more prevalent i.e. ironwood in stands of northern hardwood; and quantifying the presence and intensity/level of deer browse, especially important in cover types that have a history of being over browsed i.e. red oak, paper birch (as well as gaps within northern hardwood stands).

FRM will be a component of the continuous forest inventory and incorporated as part of that program (which, as previously described, will also be developed and implemented in 2018). Between FRM and CFI, Bayfield County will have a myriad of stand and landscape level information that will be used in all future forest management planning processes.

Prescribed Fire

Prescribed fires has traditionally been used to maintain portions of the fuel breaks located in the Township of Barnes, as well as to facilitate natural red oak reproduction in stands located throughout the county forest.

In 2018, 0 acres of forested stands will be treated with prescribed fire, where the goal is to facilitate the regeneration of certain tree species i.e. red oak. However, portions of the existing fuel breaks may be treated with fire, if conditions allow. Fuel break burns are coordinated by the DNR.

In 2018, in addition to the 190 acres of fuel break maintenance, roughly 307 acres within the core of the Barnes Barrens Management Area will be burned. County staff has always been invited to assist in the process and generally do, if time allows.

WILDLIFE PROJECTS

A number of wildlife projects will again be undertaken in 2018. The majority of wildlife habitat improvement work conducted on county forest land will be accomplished utilizing funding from Wisconsin DNR grant programs, specifically, the County Conservation Aids and Nickel-an-Acre programs.

The Nickel-an-Acre program reflects a change from the previous Dime-an-Acre funding. As indicated in the name, the program funding was cut in half starting in 2010 and will continue to be funded at a nickel an acre into the foreseeable future. The County Conservation Aid grant requires a 50% county match on eligible projects.

The Conservation Aids project for 2018 have yet to be determined. There traditionally has been approximately $3,993 available for eligible projects. Additional monies may also be available, as determined by the total amount of unallocated funds. If additional funds are available, the Department may apply for more assistance.

The Nickel-an-Acre grant totals roughly $8,467. This grant has been used to fund a variety of County Forest wildlife projects in the past.

Potential projects for 2018 could include, but are not limited to:

- Site prep for and seeding of jack pine in the Barnes Barrens Management Area.
- Mechanical and/or chemical treatments for wildlife opening maintenance (currently roughly 100 acres combined per year).
- Wildlife habitat development/improvement throughout the forest.
- Mechanical site prep for natural white birch, red oak or northern hardwood regeneration.
- Prescribed burning of wildlife openings and oak regeneration areas.
- Fish habitat projects.
- Habitat projects on old homesteads.
- Wildlife monitoring.
- Breeding bird surveys.
- Land acquisition.
- Trail development and renovation (primarily for hunting access).
- Trail mowing and/or game opening maintenance.
- Equipment purchase (where the equipment would have a specific benefit wildlife habitat).
- Invasive species control and eradication.
- Deer exclosures for red oak regeneration (fencing).
- Seedling protection (bud capping, spraying, etc.).

Any of the above listed projects, or those of a similar nature, could be implemented in 2018, generally as conditions and funding allow.

ACCESS MANAGEMENT

The revised Access Management Plan (Chapter 700) was finalized and approved in 2013.

Implementation of the Plan began in 2014 and will continue through 2018. The focus will be on the placement of road and trail markers, informational signage, minor repairs of existing roads and trails, evaluation of and potential changes to current use designations and the installation or removal of restrictive features (i.e. berms, gates, etc.) to manage motorized access.

Also, the Department will monitor existing road and trail infrastructure to determine future use status or need. All new roads created as part of a timber sale will also need to be reviewed to determine the future use status. Motorized and non-motorized uses are consistently increasing. The Department will continue to address recreational needs and requests on a case by case basis.

Repair and maintenance of the infrastructure will occur on an as needed basis, as funding allows. Road building projects may also be developed, especially on those that receive high levels of use, are located in more sensitive areas in need of minor attention, and/or provide access into current or future timber sales and have the potential to increase future stumpage prices. Road projects can be performed by Department staff, DNR staff or general contractors.

The Access Management plan will also be reviewed periodically to determine effectiveness and/or in response to general feedback. Any and all proposed updates to the Plan will be presented to the Committee for review and approval.

The Department will continue to maintain roughly 40 miles of Primary Forest roads, for which we receive DOT County Forest Road Aids (currently $336/mile, which is pro-rated based on available funding). The Department will also continue to identify, plan and/or develop additional forest roads and trails, as the need arises, for later entry into the County Forest Road program.

The Department also maintains an abundance of private temporary access permits. These permits authorize a landowner the right of ingress and egress to privately owned land, through the county forest. Permits are temporary, generally good for a period of ten years, and must be renewed upon expiration (or sale of the property). If approved, the permitted landowner must maintain the approved access road as outlined in the agreement. Every year, the Department approves anywhere between 6 to 10 temporary access permits. Permitted access roads are generally monitored

One primary goal heading into 2018 will be the development of a more effective plan for monitoring the extensive road and trail infrastructure. The creation of the Inventory and Analysis Forester position will provide added flexibility to more effectively allocate workloads and prioritize the implementation of the access management plan.

BAYFIELD COUNTY FOREST PLAN

The existing County Forest Comprehensive Land Use Plan for the period 2006 – 2020 may be amended to reflect changes and/or updates. Some items that may require updating in 2018 include, but are not limited to:

- Integrated Resource Management Unit (IRMU) summaries.
- IRMU boundaries.
- Barnes Barrens Management Plan summary.

- Timber sale contract language.
- Firewood permit language.
- Miscellaneous forest products permit language.
- Timber sale rutting policy.
- Forest certification (addition of FSC).
- Silvicultural revisions/updates on individual forest types.
- Updates to specific sections of the Plan.

There were some general expectations that updates to the Comp Plan would have begun in 2017. However, that did not happen. The development of two new programs (CFI and expansion of FRM) will consume a considerable amount of time in 2018. However, there may be an opportunity to begin the update process in 2018. If so, it is not fully known which sections will be updated first. Chapters 600 (Protection), 500 (Land Management and Use) and 800 (Integrated Resource Management) are all high on the priority list. All updates would be addressed by the Committee, will incorporate a level of public input/involvement and eventually be addressed by the full Board for final approval.

RECREATION (on County Forest Lands)

The Department will continue to work with the County Tourism Department and interested user groups regarding recreational activities occurring on the county forest. The demand for recreational use on county forest land continues to increase.

Over the past few years, the Forestry and Parks Committee has approved numerous re-routes of snowmobile and ATV trails, the construction of new, and re-routes of existing, mountain bike and cross country ski trail networks, numerous improvements to existing hiking, mountain bike and cross country ski trails and an expansion of the shooting range off North Boundary Road to include a trap component.

Requests to host events on trails located within the forest continues to increase as well. Some of the more notable events that utilize portions of trails located on the forest include: the American Birkebeiner Cross Country Ski Race, the Chequamegon Fat Tire Mountain Bike Race, the Cable Area Off-Road Classic Mountain Bike Race and the Apostle Islands Sled Dog Race. Over the past few years, the Department (Committee) approves an average of approximately twenty (20) organized events per year that utilize trails located on the county forest.

The Department also maintains land or recreational use agreements or leases with a variety of organizations, some of which include: the American Birkebeiner Association, CAMBA, North Country Trail Association, North End Ski Club, Ashwabay Outdoor Education Foundation, National Fish Hatchery, Town of Barnes, ABC Sportsmen's 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.

Requests for new or improvements to existing motorized and non-motorized trail systems are

expected to continue in 2018 and beyond. Requests for additional trails will be treated on a case by case basis, as per the Access Management Plan.

Counters have been installed in a variety of settings to determine actual use of certain trails and/or areas. Data received from these counters will provide the county with valuable information needed to determine future direction. Additional counters have been purchased and will continue to be installed throughout the forest to monitor usage in 2018.

Throughout any given year, the Department will explore additional opportunities to enhance and improve the recreational use of the forest. Existing networks are routinely analyzed and areas are explored for new or improved recreational potential. Some potential projects for 2018 include:

1. Finish minor repairs and signing of the Lost Creek Falls Trail. Due to an abundance of trail use, the Department may also install a temporary portable restroom at the Lost Creek Falls trail head. Access to the stream will be re-assessed in 2018. Steps or similar structures may be required to accommodate the intensive amount of use this trail receives. Over the past few years, this trail has received significant upgrades by the Department. Since the upgrades, use of the trail has increased substantially. Counters installed on the trail before and after the upgrades have verified the increase in use: from an average of about 2 users per day (before upgrades), to an average of around 20 users per day (after upgrades), with a peak use of over 80 users per day (around 4th of July weekend).
2. Continue routine maintenance of the two newly constructed yurts on County Forest land. During the summer of 2016, one yurt was constructed in the Cable area and one near Mt. Ashwabay.
3. Construct the third yurt about ½ mile north of the existing yurt at the Bayfield location. Layout and amenities will be about the same as the current structure, i.e. 20 foot yurt, extensive deck, woodstove, two bunkbeds, outdoor fire pit, pit toilet/privy, lean-to for firewood storage, bear proof box, numerous picnic tables. Will share the same parking area as the existing yurt, which may require a minor amount of expansion. This location will also be made available for rent through Airbnb, in a similar layout and manner as the existing units. Price will also be the same, currently $65/night.
4. Re-evaluate the Jolly trail network. As part of the process, determine existing uses and future direction. Also re-explore partnerships with the Ashwabay Outdoor Education Foundation, as well as the Town of Bayfield, regarding future maintenance and/or grooming of the trails. As part of the assessment, upgrades to existing features, including the trail and parking lot may be required, as budgets allow.
5. Explore the potential of creating new, or improvements to existing, multi-use, non-motorized trails at numerous locations including: the Glacial Kettles Area, Spring Creek Area, Lost Creek Falls, the Menard Road Area and/or other locations throughout the Forest where good potential exists. It may also require submitting applications to one or more grants, to assist in any requirements related to planning, development or construction. Pursue as time and funding allows.
6. Explore the potential of improving or expanding the existing motorized trail networks on public and private lands (both state funded and non-funded). This may require collaborating with other public land managers i.e. USFS, DNR, etc., the Red Cliff Tribe, interested user groups and the general public. It may also require submitting applications to one or more grants, to assist in any requirements related to planning, development or construction. Pursue as time and funding allows.

7. Explore the potential of creating dispersed rustic camping sites on other portions of the county forest. Pursue as time and funding allows.
8. Develop and implement strategies for advertising and/or promoting recreation on the county forest. This may include collaborating with the Tourism Department, as well as other agencies or local businesses where tourism is a primary objective. Pursue as time and funding allows.
9. Create a new recreational trail development and maintenance strategy, with an emphasis on identifying critical trail connections and areas for new construction or enhancement. The plan would/could include strategies for both motorized and non-motorized recreation, as well as the development of incentives or other appreciation type programs for private landowners when trails are located on private land.
10. Continue working with existing user groups on the management of approved trails located within (or otherwise connected to trails located on) the forest. This could include assistance, both financially and/or physically, associated with the construction, maintenance or development of new or existing trails and trail heads. Also includes consultation and collaboration regarding potential re-routes or other issues pertaining to the management of the trails. Will be working with the dogsled group in the north to develop a similar rec use agreement.
11. Continue working with the ABC Sportsmen's Club with regards to the newly revised shooting range lease. The Club operates and maintains a shooting range, on county forest land, off North Boundary Road in the Town of Bell. As part of the new lease agreement, the Club will be required to submit annual reports to the Department summarizing range use, soil testing and lead reclamation activities (if any). Also, in 2018, the Club may begin construction of a trap range, assuming all applicable permits have been acquired, located adjacent to the shooting range.
12. Update the GIS database to accurately reflect the location and relevant information regarding all currently approved motorized and non-motorized trails, trail heads, recreational structures and access routes on the forest.
13. Continue the development and installation of interpretive signs and/or kiosks along popular or well used trails or areas. The goal of the signs would be to convey information regarding any timber management that did or will occur in the general proximity of the recreational trail or area. The signs would be fairly general in nature and intended to provide baseline information regarding forest management. Pursue as funding allows.

OTHER ACTIVITIES

Insects and Disease:

The DNR and Department are continuing to monitor the effects of forest insects and diseases, including, but not limited to: jack pine budworm, two-lined chestnut borer, emerald ash borer (though not currently located on the forest, but both Douglas and Sawyer counties are under quarantine), gypsy moth, oak wilt (though not in this county), annosum root rot (now called Heterobasidion root disease or HRD for short) and more. If sites containing a significant amount of insect infestation or disease are discovered, they will be monitored for damage and/or mortality. Depending on the level of damage, prompt management may be required. As new threats are encountered, the Department may need to alter management plans accordingly.

Gypsy moth numbers, and subsequent defoliation, had been previously observed in very high numbers in the Bayfield Peninsula. The greatest numbers were initially discovered along higher elevations located in the general vicinity of Jammer Hill and Echo Valley Roads. Red oak and aspen are their preferred primary food sources and are the most susceptible to potential mortality, especially the suppressed and over mature individuals (red oak being of most concern). Significant defoliation of red oak and aspen occurred in these areas during the summer of 2012.

However, egg mass numbers declined dramatically in 2013 and remained low in 2014 and 2015, and relatively low in 2016 and 2017, indicating that defoliation may only be minor in 2018 and beyond. As a result, we will resume all red oak management in the areas where egg mass counts were high in 2012 (currently IRMU's 1 and 8). If gypsy moth numbers significantly increase in 2018, oak management may be adjusted accordingly. If oak management is reduced in specific units, the sustainable goal in all other units may be adjusted accordingly.

The Department is continuing to work with the DNR regarding up to date information and management recommendations, as well as determining the best course of action regarding general forest management practices in the face of a threatening gypsy moth defoliation event or any other impending impacts by insects or disease.

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, that there are now 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. Other than targeting ash a little more often during management (and encouraging the regeneration of other suitable species), Bayfield County is not expecting a major change in forest management practices if/when EAB is found on the forest, though the movement of ash products would be regulated if/when quarantined. However, the re-evaluation of swamp hardwood stands has been identified as a top priority in 2018. The density of ash will be one of the major criteria collected as part of the re-evaluation, as will be different forms of reforestation.

Invasive Species:

The Department routinely inspects roads and timber sales for the presence of invasive species. If located, a plan for treatment is developed. The presence of invasive species (both native and non-native) is relatively rare on the forest, though treatment efforts have steadily increased over the past decade. The Department typically treats a few small patches of land per year.

The most common non-native invasive species treated on the county forest are buckthorn (in the forest) and spotted knapweed (on roads and trails). Black locust has been the most common native invasive to be treated on the forest, typically occurring in small isolated patches in the vicinity of old, abandoned homesteads.

Treatments have traditionally been performed by Department staff, usually involving chemicals. In general, the Department treats less than 10 acres of invasive species per year. In 2018, that number is expected to be as high as 40 acres of buckthorn and up to 40 acres of black locust. Consequently, it may become necessary to contract out treatment, especially if other Department activities require more time or become higher priority. All occurrences are managed on a case by case basis, as funding allows.

In 2014, the Department received a Sustainable Forestry Grant for the treatment of spotted knapweed on 50 miles of forest roads in the Barnes Barrens Management Area. The project was completed in 2015. However, spotted knapweed maintains a persistent and viable seedbed for around 7 years, meaning multiple successive treatments are required to reduce the population.

The same 50 miles of road was treated in 2016 and 2017 (actually 52.5 miles in 2017), and will be treated again in 2018. The long term goal is to use herbicide to manage and eventually eliminate (or significantly reduce) knapweed in the area and, hopefully, prevent any further spread into the barrens. To date, the treatment has been a success, as knapweed has already been significantly reduced. In addition, the amount of chemical used to treat the same 50 miles of road and significantly declined with each treatment. The project focuses on roads that are the most heavily infested, but more still needs to be done.

Permits:

Every year, the Department reviews numerous requests to utilize portions of the Forest. Requests vary, but the most commonly include: providing access to private lands; providing access to land or trails for hosting organized recreational events; collecting balsam boughs; and collecting firewood. All requests are treated on a case by case basis and are typically handled with a use permit.

Table 4 summarizes the total permits and approvals issued by the Department from 2008-2017 (2017 is an estimates):

Table 4: 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	0	6	17	10	1
2017	285	19	1	4	0	7	16	6	1
Avg.	407	9	3	4	0	6	14	6	2

** specifically advertised for jack pine cones in 2013*

Many of the permit templates are old or outdated. The Department will periodically review existing permits, including permit fees, or identify the need for new ones and bring all recommendations to the Committee for review.

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). Starting in CY 2014, Bayfield County increased the funding level to 2%, with a cap of $80,000. As a result, $80,000 has been available for eligible Town Road projects in each of the last four years (2014-2017).

It is anticipated that $80,000 will again be available in 2018. All projects are submitted to the Department and ultimately approved by the Forestry and Parks Committee. The Department works closely with each Town in the development and administration of each potential project.

Land Transactions (Acquisition and Sale):

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 preliminarily 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 was added to the county forest.

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 (primarily from 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.

The county still maintains ownership of approximately 245 acres of non-county forest lands that could be used as a match in future Stewardship projects. These properties were appraised at $423,000, meaning they would have roughly $211,500 worth of buying (match) power (as per the Grant, properties owned for more than one year are valued at ½ of the appraised assessment). In addition, the county also owns over 3,000 acres in the Bibon Swamp. These properties may also be used as a match and enrolled in county forest law as special use lands.

As previously mentioned, in late fall 2016, the county purchased another 200 acres of land previously owned by the Wisconsin DNR. Combined, these two acquisitions have added 2,800 acres to the county forest.

In 2018, the Department will prepare and present another large Stewardship acquisition project, utilizing the above mentioned county owned properties as a match. Assuming favorable appraisals on the match lands, as well as fair pricing on the purchase properties, the Department will be able to develop a grant in the neighborhood of $3.0 million.

As part of the Stewardship grant application process, the county forest blocking boundaries may also need to be modified (all properties included as part of the grant, either as a match or a purchase, must be located within the County Board approved county forest boundary). The primary goals of land acquisition are to further improve the efficiency of county forest management by consolidating (or blocking) lands within established county forest blocking and to provide additional public benefits through the purchase of forest land or special and/or unique areas. County forest blocking boundaries were traditionally arbitrarily placed, based primarily on the current location of county forest lands. If a parcel of interest (to purchase) or match property is located outside the current boundary, the blocking will be adjusted accordingly.

The grant would also include $80,000 from the most recent sale of land to the Red Cliff Band of Lake Superior Chippewa (80 acres was sold to the Tribe in 2017 as part of the recently ratified MOU between Red Cliff and Bayfield County). An additional 80 acres of land is currently in the process of being sold to Red Cliff. If the timing works, proceeds for that sale will be added to the grant application as well. No additional out of pocket costs by the county are expected as part of the Stewardship grant.

If approved and awarded, the Stewardship grant would utilize the appraised value of 3,040 acres of county owned land within the Bibon Swamp and a little over 261.25 acres of county owned forested properties, to purchase approximately 2,350 acres of privately owned forest land. All lands identified as part of the project would be enrolled in county forest law, meaning over 5,600 acres could be added to the county forest.

As previously mentioned, the County will also continue to engage with Red Cliff regarding the future sale of county forest land to the Tribe, as per the MOU. Such transactions will be treated on a case by case basis. Other requests to purchase land will also be treated on a case by case basis. All proceeds from the sale of county forest land will be re-invested in land, and enrolled in county forest law.

Forestry and Parks Department Garage and Equipment

Periodic and general maintenance will be required on the newly constructed Forestry and Parks Department garage (construction finished in the fall 2014), including minor work on the grounds and landscaping.

The Department maintains a sizeable fleet of vehicles, implements and equipment, including, but not limited to:

1. Nine (9) 4x4 pickup trucks.
2. Five (5) ATV's.
3. One (1) UTV.

4. Four (4) snowmobiles.
5. One (1) bat wing field mower and one (1) trail mower.
6. One (1) 2002 115 hp New Holland TM115 tractor, with end loader.
7. One (1) 2006 John Deere 450J bulldozer.
8. Two (2) light weight trailers.
9. Numerous site prep implements including Brackee seeders, anchor chains, and various plows.
10. Numerous power tools, saws and trimmers.

The repair and maintenance on any of the above listed items could occur at any time during CY 2018. All repairs are treated on a case by case basis, as budgets allow. Major repairs (or replacements) may require funding that would exceeded budgeted amounts. If that occurs, additional requests for funding will be brought to the Committee and full Board.

Management of Other Bayfield County Owned Lands:

Currently, Bayfield County owns approximately 2,000 acres of county tax title lands, not including lots and other small parcels, in addition to the above listed county forests lands. Also, the county owns approximately 3,000 acres of land located in the Bibon Swamp.

On occasion, the Department will monitor these parcels for land and/or timber sales, monitor for potential trespass issues, negotiate road, utility and recreational easements or permits and explore for sand and gravel potential. As new parcels are acquired, typically through tax delinquency, the Department will commonly inspect for timber management potential and/or for potential retention and enrollment into county forest law.

Good Neighbor Authority:

The US Forest Service has been authorized to enter into cooperative agreements with states to carry out approved forest, rangeland and watershed restoration services, including timber sales, on federal land, as per the Good Neighbor Authority (GNA). Under a cooperative agreement between the US Forest Service and the DNR, the DNR may conduct forest management activities on federal lands. Further, the DNR may contract with a county for the purposes of conducting forest management activities on federal lands, as outlined under the GNA agreement.

Recently (fall 2015), the DNR and the Chequamegon-Nicolet National Forest (CNNF) signed a ten year GNA Agreement, which will be reviewed annually to update the scope of work, as well as to identify additional timber and restoration treatments. The partnership enables the CNNF to more fully implement their forest plan and increase the amount of timber offered for sale. The goal for the CNNF in FY 2017 is to again reach 100 million board feet in timber sales. Through the GNA, the DNR has a goal of assisting the CNNF in accomplishing approximately 25 million board feet (roughly 5,500 acres) of additional timber sales in FY 2017 (that may not have been established otherwise).

The DNR anticipates 15 to 20% of the timber sale work identified under the Agreement to be accomplished by interested counties. If interested, a county can decide their level of involvement,

which could include the use of existing staff or hiring part time employees. Counties would be reimbursed for all expenses, including salary, fringe, supplies and service costs, and overhead. Also, if interested, each county would need to adopt a resolution, which approves entering into an MOU with the DNR. As per the MOU, each county would be required to enter into a GNA program contract with the State, which describes the level of involvement and project budget (i.e. rates of reimbursement).

In spring 2016, Bayfield County entered into a GNA 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. The Department will continue to work with the state on the development of annual GNA program contracts.

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. All work provided by Department staff related to GNA will come as overtime, as the Department has no time to spare during normal business hours. The scope of work is subject to annual revisions and Department involvement will be highly dependent on opportunities located within the Washburn Ranger District.

In 2017, the county entered into a program contract with the DNR to manage 675 acres of red pine (20 stands) on the Chequamegon-Nicolet National Forest (Washburn District). It was estimated that 971 hours would be required to establish the timber sales. The program contract runs through June 2018.

In 2018, it is anticipated that the Department will allocate another 750 to 1,000 hours of time towards the establishment of timber sales on federal land within the Washburn Ranger District. Again, this would be as overtime (and totally dependent upon interest from Department staff), which would be identified and reimbursed as such under any GNA program contract signed with the DNR.

PARKS

The management of all Bayfield County parks and campgrounds was assigned to the Forestry Department in September 2010. The four parks and campgrounds include:

1. Twin Bear Campground
2. Delta Lake Campground
3. Big Rock Campground
4. Atkins Lake Park

Since 2010, numerous changes and upgrades have been made to many of the campgrounds. Some of the more significant improvements include:

1. Twin Bear Campground
    a. Complete electrical rebuild and upgrade throughout entire campground.

b. Repair of all major outbuildings and cabin.
c. New fishing pier near the beach area.
d. New ADA ramp construction near beach area.
e. Creation of new tent camping site.
f. Re-establishment of sand beach.
g. Re-establishment of the parking area near the beach, including the installation of a french drain to better control runoff.
h. New individual gas water heaters for each of the three showers.
i. New playground equipment near the beach area.
j. Re-surfacing of walking path near Puig's Point.
k. New wireless high speed internet access throughout the entire campground.
l. New locks/keysets on all outbuildings (all keyed the same).
m. Added canoe and kayak rentals (though temporarily discontinued in 2017).
n. New seasonal mooring dock.
o. New transient mooring dock located near the seasonal docks.
p. New overflow parking area located near the dump station.
q. Installed new fencing and gravel pad next to the garage (for outdoor storage).

2. Delta Lake Campground
    a. Complete re-grade on nearly all existing campsites.
    b. New playground equipment near beach area.
    c. Two new fishing piers.
    d. Repair of all major outbuildings.
    e. New electric added to remaining campsites.
    f. New wireless high speed internet access throughout the entire campground.
    g. Installation of new mooring dock and small picnic area.
    h. Modifications to the ADA ramp/path.
    i. New locks/keysets on all outbuildings (all keyed the same).
    j. Added canoe and kayak rentals (though temporarily discontinued in 2017).
    k. Repair of walking path near the playground.
    l. Repair of beach area.
3. Atkins Lake Park
    a. New boat launch ramp installed in 2017.

All parks and campgrounds undergo routine cleanup of brush and downed trees on a regular basis. Parks and campgrounds are also regularly inspected for hazard trees and branches, which are removed as needed. The removal of hazard trees or branches typically occurs when camping is inactive, usually in the late fall or early spring. Most of the trees are cut up and left on site to be used as firewood. Every year, there will be some removal of hazard trees and/or branches.

Some anticipated projects or minor repairs needed to the parks and campgrounds in 2018 include:

1. <u>Twin Bear Campground</u>
    a. Continue hazard tree removal and overhead branch mitigation, as needed.

b. Inspection of retaining walls on a few campsites for future repair.
c. Re-grade on a few existing campsites and road surfaces.
d. Explore the need to add gutters on the cabin store to divert water away from the entrance to the building.
e. Explore the potential for two new tent campsites on the hill behind shower building. Clear area and remove hazard trees. Develop as funding allows.
f. Assist campground manager in some routine maintenance of the grounds, as time and funding allows.
g. Install/re-establish speed bumps at multiple locations.
h. Install fencing around new electrical box near garage.
i. Assess potential to improve ventilation in the shower building. Mold and mildew buildup are constant issues and current overhead venting may be inadequate. Proceed as funding allows.
j. Continue routine replacement of numerous old picnic tables, as needed.
k. Transplant trees from hill behind the shower building to the perimeter of the beach to provide future shade.
l. Draft and implement a noxious weed mitigation plan for the campground. Continue to monitor for new infestations. Treat as required.
m. Continue monitoring existing infrastructure, repair as needed and as budgets allow.

2. Delta Lake Campground
   a. Evaluate the condition of all primitive toilets in the campground. Replace as necessary and as budgets allow.
   b. Explore the potential for tent camping on county owned island.
   c. Some minor clean up and rehabilitation of grounds may still be necessary after the winter 2014/2015 timber sale, which removed all hazardous trees.
   d. Re-grade a few existing campsites and road surfaces.
   e. Explore the potential for a new fishing pier off the end of the access path near the beach.
   f. Assist campground manager in some routine maintenance of the grounds, as time and funding allows.
   g. Assess potential to improve ventilation in the shower building. Mold and mildew buildup are constant issues and current overhead venting may be inadequate. Proceed as funding allows.
   h. Continue routine replacement of old picnic tables, as needed.
   i. Continue monitoring existing infrastructure, repair as needed and as budgets allow.
3. Big Rock Campground

   Repairs, upgrades, improvements and short/long term planning will be a priority at Big Rock in 2018. A total of $25,000 has been budgeted for maintenance and trail development. Some of the priorities will include:
   a. Explore the potential of adding a covered pavilion near entrance of campground, though building a pavilion was not funded in 2018.
   b. Minor repair on all access roads and the primary parking lot. Most likely will require additional surface material.
   c. Minor repairs to sections of the primary access trails to the river. Some

portions may require relocation. These are old fisherman trails that were established by use, over a long period of time. Many are currently unsustainable and in need of maintenance.

d. Assess condition of trees throughout the campground. Develop hazard tree trimming and removal plan. Many of the large white pine are in need of branch trimming or complete removal. Pursue as funding allows.
e. Explore potential for rec trail development within the 40 acre county owned parcel. Pursue as funding allows. This portion was approved for funded in 2018, up to $10,000. Also collaborate with the DNR regarding the potential to extend rec trails onto adjacent state owned properties.
f. Re-grade or repair camping pad locations on numerous campsites. Pursue as funding allows.
g. Repair and/or replace the large primary campground sign. Explore new sign designs and pursue as funding allows.
h. Replacement of numerous picnic tables.
i. Repair and/or replacement of many campsite markers.
j. Explore the potential of developing a hike in rustic campsite or yurt on the property.
k. Assist campground manager in some routine maintenance of the grounds, as time and funding allows.
l. Collaborate with the DNR on a lease, trade or sale of the strip of state owned land on the eastern most portion of the property. Purchase of this small sliver of land would be preferred. A very large, dead white pine exists on this piece of state land that needs to be removed, as it is threatening a campsite and the primary parking area.
m. Possible replacement of a door on one of the bathrooms.

4. Atkins Lake Park
    a. Replace sign leading into the park.
    b. Assist campground manager in some routine maintenance of the grounds, as time and funding allows.
    c. Brush encroaching trees and vegetation along primary access road into the park.

Numerous unknown issues or projects will undoubtedly surface throughout the year. All unknown issues will be addressed based on significance and/or importance, as time and budgets allow.

Another primary goal for all parks in 2018 will be the development of short/long term comprehensive management plans. Among other things, the plans would summarize each park, while fleshing out short/long term goals, visioning, objectives and priorities.

MOTORIZED TRAILS AND RECREATION (Emphasis on State Funded 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 land (also groom snowmobile trails on federal land). To help accomplish this task, Bayfield County maintains agreements with the Bayfield County Snowmobile Alliance and local ATV clubs (and USFS).

Table 5 displays the total miles and annual maintenance funds received from the State of Wisconsin per trail type:

Table 5: Mileage and Funding For Trails Managed by Bayfield County

Trail Type	Miles	Rate/Mile	Total
Snowmobile	437	$300	$131,100
ATV Summer	86.75	$600	$52,050
ATV Winter	168.15	$100	$16,815
UTV	86.75	$100	$8,675
Total	778.65		$210,305

In addition to the routine maintenance performed on these trails by the Alliance and local clubs, below is a listing of anticipated Trails projects or issues that may be addressed in 2018:

1. Generate a recreational trail development and maintenance strategy, with an emphasis on identifying critical connections and areas for new construction or enhancement. This may require input from existing partners and user groups, as well as the general public.
2. Continue to re-establish roles and responsibilities with the BCSA, snowmobile clubs and ATV clubs.
3. Update contracts with the BCSA and other clubs.
4. Continue to resolve numerous landowner disputes regarding land ownership and/or trail location.
5. Continue to work, along with the County Tourism Department, on building a supportive network of local chambers, business owners and community members that will help in the financial and/or logistical support of the Bayfield County trail networks
6. Maintain a database identifying each club and officers, as well as location and mileage maintained for snowmobile and ATV trails.
7. Develop and maintain a database identifying the location and condition of all bridges, culverts, gates and outbuildings on snowmobile and ATV trails.
8. Creating a maintenance/inspection schedule for #7.
9. Develop and maintain a database for all existing permits or easements allowing snowmobile and ATV trails to occur on private land.
10. Develop and maintain a database that categorizes the importance of each trail to the overall network/community i.e. high, medium, low. The database would help ascertain the importance of future repair work. For example, a major repair on a trail designated as low importance might not be a high priority.
11. Combine #'s 9 and 10 to determine where to focus obtaining future easements or access permits.
12. Develop updated permit/easement form.
13. Pursue the concept of compensation to private landowners who allow recreational trails on their land.
14. Explore the potential to install trail counters at strategic locations throughout both networks (ATV and snowmobile) in an attempt to gain a better of how each system is used (quantify use). Understanding the level of use will provide a wealth of information for both short and

long term planning efforts.

15. Continue to pursue 5 acre land acquisition to secure ATV and snowmobile trail access on Trail 7 in the Town of Barnes (DNR ORV grant was preliminarily awarded in 2017).
16. Complete repair work on Trail 1 off Klemik Road (previously awarded DNR Snowmobile grant).
17. Complete minor repair work on Trail 31 north of 43 Road, that was damaged from the heavy July 2016 rain storm (a FEMA project).
18. Assess Trail 31, the portion on county forest land, for potential application of a DNR snowmobile trail rehabilitation grant. Much of the trail is very wet and in need rehab, including, but not limited to: beaver mitigation, trail surface improvements, potential trail widening and/or reestablishment in sections, water management, and treatment of encroaching brush. Proceed as need and funding allows.
19. Continue coordination with the Snowmobile Alliance and DNR on the implementation of the newly established Snowmobile Electronic Reports System (SNARS), recently developed by the state.
20. Compile a list of beaver dam issues impacting trail infrastructure. Coordinate with local trappers and/or the USDA APHIS Animal Control Services to eradicate the problem animals and destroy associated dam structures.

The above listed items are known issues or projects that need attention in 2018. All or most of the projects that will require significant repair work or new construction/installation will be submitted to the State for potential funding.

Numerous unknown issues or projects will undoubtedly surface throughout the year. All unknown issues will be addressed based on significance and/or importance, as time and budgets allow.

Meet the Staff

The information listed above describes the general Departmental goals and objectives for CY 2018. Below is a brief background history of Department and DNR staff employed to accomplish those goals (a new position will be created in 2018, thus increasing the number of staff members by one).

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.

Submitted by Jason Bodine, Forestry & Parks Administrator, December 29, 2017.