

SALT STORAGE NEEDS REPORT

2015-2016

**Wisconsin Department of Transportation
Division of Transportation System Development
Bureau of Highway Maintenance
Winter Operations Unit**

**March 2017
FINAL**

ACKNOWLEDGMENTS

Many people at Wisconsin DOT contributed to the development of this report, including:

- James Hughes, Bureau of Highway Maintenance
- Mike Sproul, Bureau of Highway Maintenance
- Allan Johnson, Bureau of Highway Maintenance
- Mike Adams, Bureau of Highway Maintenance
- Cathy Meinholz, Bureau of Highway Maintenance
- Lisa Meinholz, Bureau of Highway Maintenance
- Chris Ohm, Bureau of Highway Maintenance
- Tim Nachreiner, Bureau of Highway Maintenance
- Sara Flagstad, Northwest Region
- Anna Wisner, North Central Region
- Kurt Wranovsky, Northeast Region
- Jason Jilling, Southeast Region
- Rick Vydral, Southwest Region

We wish to thank these individuals for their contributions to and assistance with this report.

TABLE OF CONTENTS

1. Introduction.....	2
About This Report	2
Executive Summary of Findings	2
2. Statewide Salt Storage.....	3
Why Salt Storage Matters.....	3
Methodology - Setting the Targets	4
Statewide Findings	4
Regional Findings	6
County Findings - North Central Region	7
County Findings - Northeast Region	8
County Findings - Northwest Region	9
County Findings - Southeast Region.....	10
County Findings - Southwest Region	11
3. Annual Inspections	13
4. Salt Shed Conditions	14
Methodology - Component Rating	14
Methodology - Weighting.....	14
Methodology - Overall Shed Rating	14
Statewide Findings	14
County Findings - North Central Region	16
County Findings - Northeast Region	18
County Findings - Northwest Region	20
County Findings - Southeast Region.....	23
County Findings - Southwest Region	24
5. Conclusions.....	26
Storage Needs	26
Financial Needs	26
Appendix	27

1 Introduction

ABOUT THIS REPORT

The Wisconsin Department of Transportation (WisDOT) is responsible for the winter maintenance of state and federal highways, and collaborates with 72 county highway departments to do so. Salt and liquid brines, and their timely application, are vital to efforts to keep highways free of snow and ice. Every county stores salt for use on state and federal highways, and WisDOT reimburses counties for the costs of that salt and its storage to ensure adequate supply.

The purpose of this report is to document salt and liquid brine storage capacities and shortcomings, by county and by region, so that investment in additional capacity can be appropriately prioritized to areas of greatest need.



EXECUTIVE SUMMARY OF FINDINGS

Ensuring each county's storage capacity accommodates its salt needs each winter is a priority for WisDOT. Based on data from the past five winters, the state uses an average of 480,628 tons each year. The state's target capacity is 125 percent of average annual usage, which equals 600,785 tons. Ideally, each county, region and the state as a whole will have state-funded capacity to store 125 percent of the five-year average annual usage. Currently, only the Southeast region has the capacity to meet this 125 percent target.



As outlined in the following pages, the state's current salt storage capacity is inadequate. Only 27 of Wisconsin's 72 counties (38%) currently meet the 125 percent target capacity. The counties furthest from meeting target capacities, based on total tonnage, include Dane, Saint Croix, Milwaukee and Columbia Counties. Together these four counties represent 62 percent of the 56,077 ton statewide gap between functional capacity and target capacity, or 34 percent of the total new storage capacity needed (101,966 tons) to bring every county up to the target capacity.

The need for investment in salt storage is also increased by the need for repair or replacement of existing facilities. Based on shed condition evaluations in 2016 (described in Chapter 4), 13% of the State's functional capacity (69,633 tons) is in sheds that are considered to be in poor condition and need repairs or replacement.

2

Statewide Salt Storage

WHY SALT STORAGE MATTERS

Salt use varies from year to year. During the mild 2011-2012 winter season, county crews applied 355,519 tons of salt to Wisconsin's state and federal highways. This was 47% less than the peak year of 2013-2014, when 669,807 tons were used. This salt is stored across the state in hundreds of sheds, most of which are owned by the counties and many of which are State-financed. The cost of this salt - more than \$28 million in 2015-2016 - is affected by storage capacity in each county.

Each county orders and manages its own supply of salt through the winter season, typically purchased through a state bid arranged by WisDOT. Counties and municipalities are allowed to participate in the state bid to benefit in the combined buying power of Wisconsin governmental agencies. The current bid structure separates the salt bid into three categories: early fill, seasonal fill, and vendor reserve.

Early fill salt must be delivered before November 15th and the vendor has the flexibility to deliver the early fill salt over a period of several months between the award date and November 15th.

Seasonal salt is delivered during the winter season and is needed in counties which lack sufficient storage for an average winter or when they need to fill smaller sheds. Delivery of this seasonal salt must be within 10 days of placement of the order. The amount and cost of the early fill and seasonal fill salt, including material and delivery, is set by contract - the buyer must take delivery of that salt eventually. In the event of a milder than normal winter where all the seasonal salt is not required and will not fit into available storage, the vendors will store the salt for a monthly storage fee. This fee can be as high as \$10/Month per ton of salt stored.

Vendor reserve salt is salt that the vendor is required to have on hand for purchase at the contract price for winters that are worse than average. Unlike the seasonal salt, purchase is not guaranteed or required. The Vendor Reserve quantity is typically equal to about 25% of the total of early fill and seasonal fill salt quantities. As discovered during the winter of 2007-2008, the quality of vendor reserve salt can be lower (e.g. more impurities and debris mixed in with the salt) in a severe winter when market supply is stretched thin.

The early fill salt allows the greatest flexibility for the vendor and therefore the lowest prices. The seasonal salt and vendor reserve salt is more costly to provide due to the short-notice delivery requirements, the smaller sizes of those deliveries, and the uncertainty of demand.

These conditions increase the cost of that salt and likely exclude some potential bidders.

The state could optimize its salt costs by taking more of its salt as early fill. This would also open up the bid to more competition, including railroad delivery options. Rail delivery options are currently excluded because they cannot guarantee a 10 day delivery of seasonal or vendor reserve salt. To take more salt as early fill, the state needs more storage capacity. To the extent that some seasonal salt is still necessary, added storage capacity would also reduce the need to pay the vendor to store unused seasonal salt.



METHODOLOGY - SETTING THE TARGET

To calculate each county and region's target capacity, we first calculated the average annual salt use for each county for the past five winters - 480,628 tons. We then multiplied that average by 125 percent to establish the target capacity - 600,785 tons. To put that number in context, consider that the greatest single-season use was 669,807, or 139 percent of the five-year average. The 125 percent standard is intended to eliminate the need for seasonal and vendor reserve salt in most counties during most years.

All storage capacities referenced herein describe state financed functional and target capacities. Functional capacity is the practical or typical amount of salt a facility can store based on factors such as loading equipment and practices, and is generally less than the full design capacity. The "state financed" clarifies that this report considers only that storage that is state-funded and committed for salt used on state and federal facilities.

STATEWIDE FINDINGS

Wisconsin's five-year average annual salt use is 480,628 tons. Over the course of the past five years, annual salt use has ranged from 355,519 tons during the mild winter of 2011-2012 (75.39 severity index) to 669,801 tons in the more severe winter of 2013-2014 (133.64 severity index).

Statewide, storage facilities supported by WisDOT are equipped to effectively hold 544,709 tons. Based on the 125 percent target capacity, the state's total storage capacity should be the equivalent of 600,785 tons, necessitating a net increase of 56,077 tons of storage space. But that much new storage would not be enough to bring every county up to the 125 percent standard. The aggregate storage needed to meet this standard in every county is 101,966 tons.

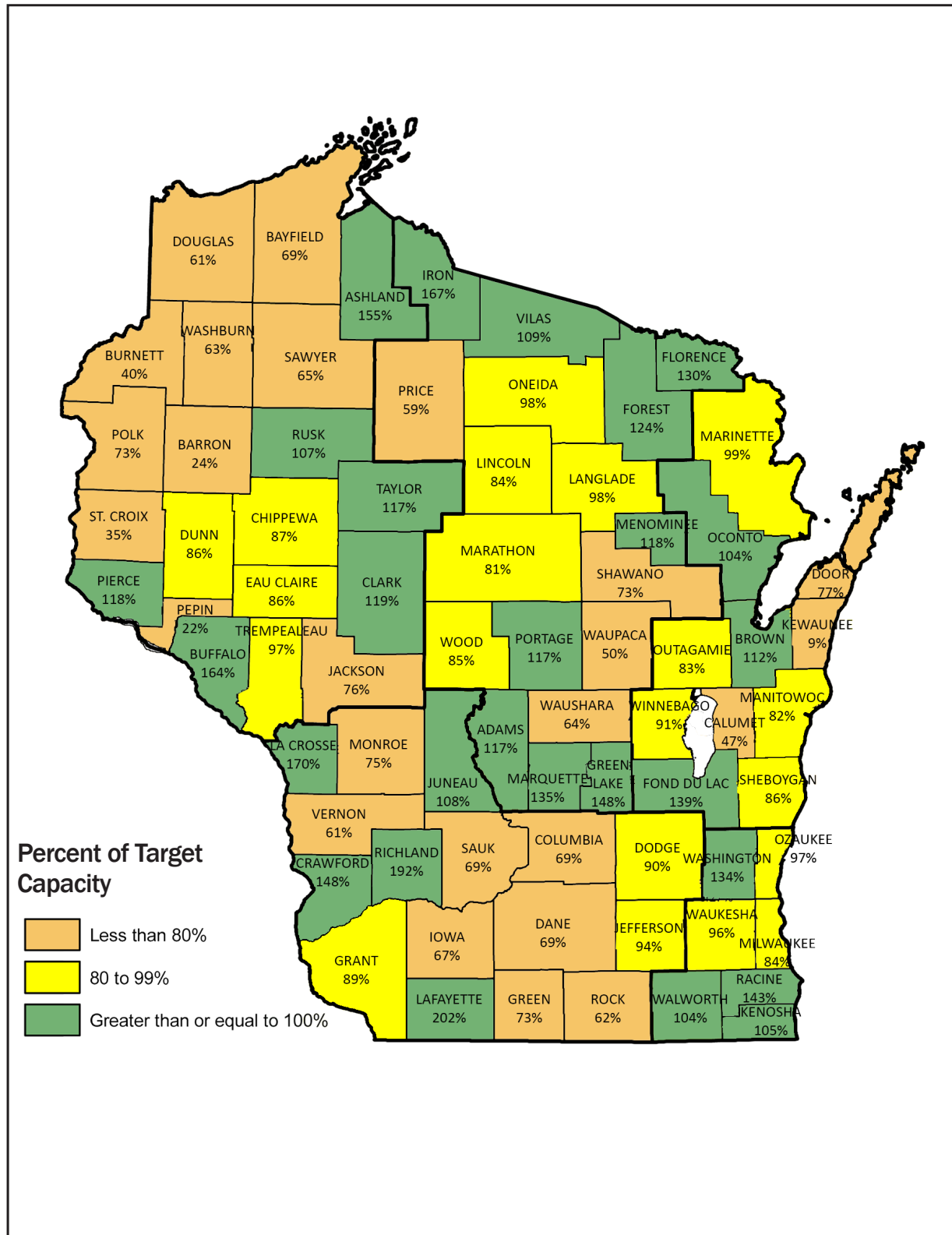
The gap between current and target capacity is greatest in the Northwest region and the Southeast region is the only region that meets its target capacity.

Table 2.1. Regional and Statewide Capacity Needs

Region	Current State Financed Functional Capacity	Target Capacity (125% of average use)	Capacity Needed to Meet Target*
Southwest	142,810 tons	169,336 tons	26,526 tons
Southeast	126,184 tons	123,082 tons	TARGET MET
Northwest	99,018 tons	124,917 tons	25,899 tons
Northeast	74,176 tons	77,105 tons	2,929 tons
North Central	102,521 tons	106,346 tons	3,825 tons
State Total	544,709 tons	600,785 tons	56,077 tons

*In this table, Capacity Needed to Meet Target is simply the net difference between current and target capacity within each region. These region and state totals include storage capacities that exceed the target in some counties, and therefore underrepresent the capacity needed to bring all individual counties up to the target storage capacity. WisDOT is planning on constructing 28 new sheds in various counties (described later in this report) which account for over 86,000 additional tons of capacity. These sheds will be constructed over the next three years. Over the next three years WisDOT is planning on abandoning 12 existing salt sheds (also described later in this report) which account for nearly 14,000 tons of capacity.

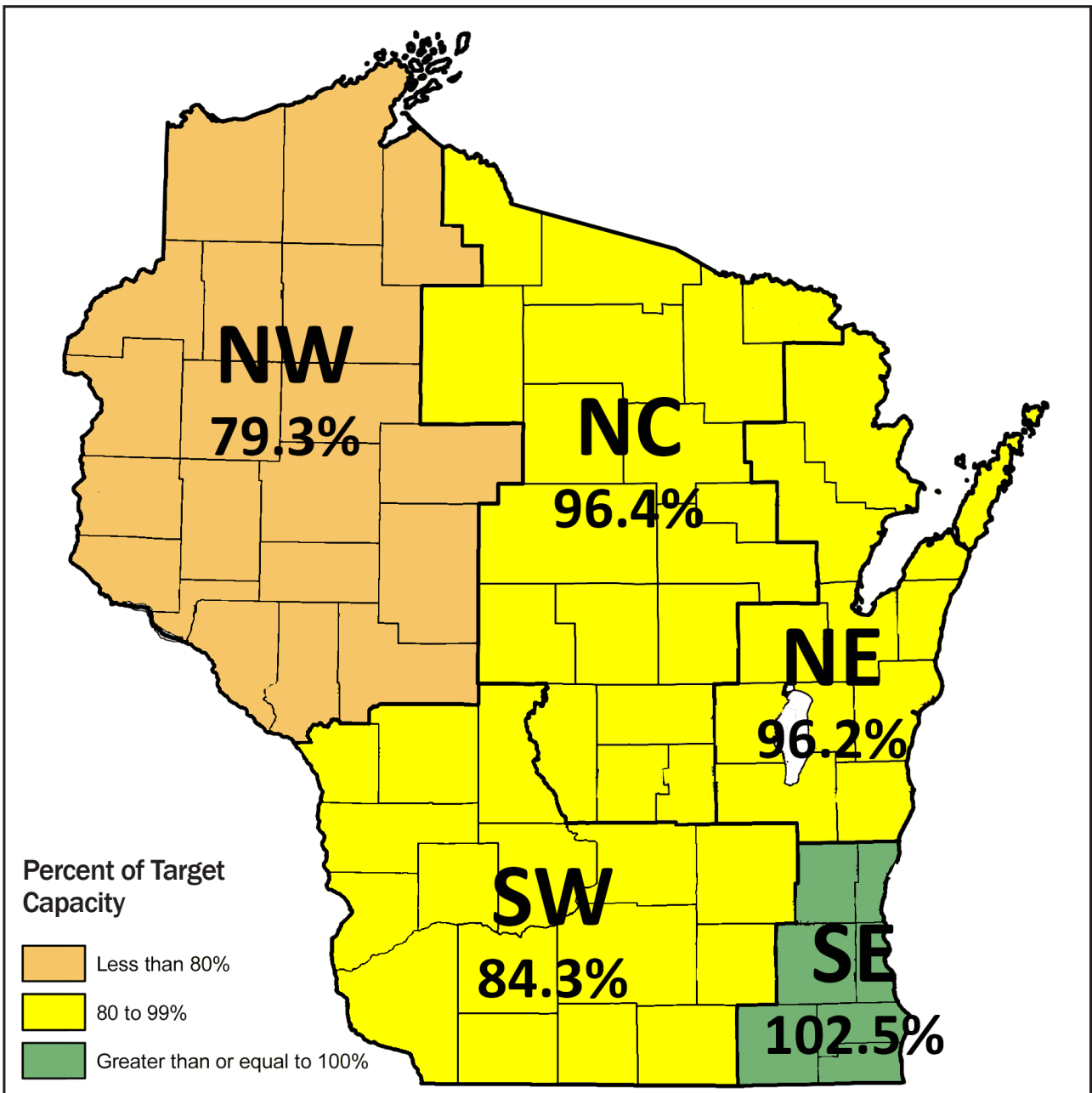
Figure 2.1. 2016 State Financed Functional Capacity as Percentage of Target Capacity (By County)



REGIONAL FINDINGS

Based on average annual use tonnage, the Southeast region is the only region meeting its target capacity goal. The Southeast region is currently able to store 126,184 tons of salt, 103 percent of its target capacity of 123,082 tons. The next closest regions to meeting their target capacities are the North Central and Northeast regions, both of which are at 96% of their target capacities. The Northwest region is currently furthest from meeting its target capacity goal. The Northwest region is currently able to store 99,018 tons of salt, 79% of its target capacity of 124,917 tons.

Figure 2.2. 2016 State Financed Functional Capacity as Percentage of Target Capacity (By Region)



COUNTY FINDINGS - NORTH CENTRAL REGION

The North Central region is currently able to store 102,521 tons (96 percent of target capacity), the region must increase its storage capacity by 3,825 tons to meet its 125 percent target capacity in every county.

Iron and Green Lake Counties have adequate space to store more than 140 percent of their annual average use, while nine of the 18 counties in the region are underequipped to store quantities equivalent to their current average annual salt use.

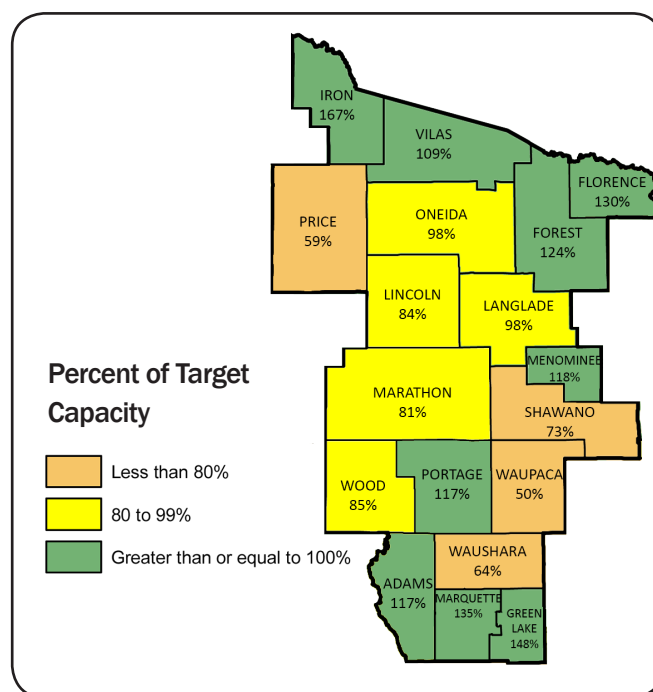


Table 2.2. North Central Region Capacity Needs

County	Current State Financed Functional Capacity	Target Capacity (125% of average use)	Capacity Needed to Meet Target
Waupaca	4,210 tons	8,384 tons	4,174 tons
Price	3,560 tons	6,078 tons	2,518 tons
Marathon	10,393 tons	12,771 tons	2,378 tons
Shawano	6,280 tons	8,602 tons	2,322 tons
Waushara	2,380 tons	3,750 tons	1,370 tons
Wood	5,365 tons	6,326 tons	961 tons
Lincoln	4,748 tons	5,645 tons	897 tons
Oneida	8,776 tons	8,949 tons	173 tons
Langlade	4,339 tons	4,414 tons	75 tons
Marquette	4,800 tons	3,544 tons	Target Met
Vilas	9,350 tons	8,608 tons	Target Met
Adams	3,625 tons	3,103 tons	Target Met
Portage	8,805 tons	7,529 tons	Target Met
Menominee	1,750 tons	1,488 tons	Target Met
Forest	8,970 tons	7,225 tons	Target Met
Florence	4,070 tons	3,134 tons	Target Met
Green Lake	1,850 tons	1,251 tons	Target Met
Iron	9,250 tons	5,544 tons	Target Met
NC Total	102,521 tons	106,346 tons	14,869 tons*

* The Capacity Needed to Meet Target is the aggregate shortfall for all counties that do not currently meet the target storage capacity. This number is greater than the difference between the regional total current capacity and the regional total target capacity because some counties already exceed the target storage capacity.

COUNTY FINDINGS - NORTHEAST REGION

In the Northeast region, only three of 11 counties meet their target capacities (Brown, Fond du Lac and Oconto Counties). As a whole, the region's current functional capacity (74,176 tons) is only four percent short of its 125 percent target capacity (77,105 tons).

Capacity needs vary greatly from county to county within the Northeast region. While Kewaunee County's current functional capacity is only 125 tons (nine percent of its target capacity), Fond du Lac County's current state financed functional capacity is 139 percent of its target capacities.

Eight of the 11 counties in the region are underequipped to store quantities equivalent to their current average annual salt use.

Note: WisDOT is planning on constructing five salt sheds in the NE region over the next three years. These sheds are not included in the table below. The location of the new sheds and their state financed estimated functional capacities are as follows:

- Door County (1,150 tons)
- Fond du Lac County (1,150 tons)
- Sheboygan County (5,000 tons)
- Sheboygan County (1,000 tons)
- Winnebago County (3,000 tons)

Percent of Target Capacity

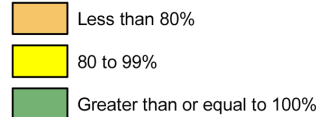


Table 2.3. Northeast Region Capacity Needs

County	Current State Financed Functional Capacity	Target Capacity (125% of average use)	Capacity Needed to Meet Target
Outagamie	6,800 tons	8,196 tons	1,396 tons
Kewaunee	125 tons	1,400 tons	1,275 tons
Manitowoc	5,850 tons	7,108 tons	1,258 tons
Sheboygan	7,708 tons	8,945 tons	1,237 tons
Calumet	1,100 tons	2,333 tons	1,233 tons
Door	3,247 tons	4,211 tons	964 tons
Winnebago	9,480 tons	10,393 tons	913 tons
Marinette	6,500 tons	6,528 tons	28 tons
Oconto	6,640 tons	6,370 tons	Target Met
Brown	13,544 tons	12,114 tons	Target Met
Fond du Lac	13,182 tons	9,506 tons	Target Met
NE Total	74,176 tons	77,105 tons	8,304 tons*

* The Capacity Needed to Meet Target is the aggregate shortfall for all counties that do not currently meet the target storage capacity. This number is greater than the difference between the regional total current capacity and the regional total target capacity because some counties already exceed the target storage capacity.

COUNTY FINDINGS - NORTHWEST REGION

The Northwest region's current capacity (99,018 tons) equals about 79 percent of its target capacity (124,917 tons).

The region must increase its storage capacity by 25,899 tons to reach the 125% capacity target.

Six of the Northwest region's 20 counties meet the 125 percent target capacity. Two of the counties have storage capacity exceeding 150% of average annual use (Buffalo and Ashland Counties).

Fourteen of the 20 counties in the region are underequipped to store quantities equivalent

to their current average annual salt use.

Note: WisDOT is planning on constructing five salt sheds in the NW region over the next three years. These sheds are not included in the table below. The location of the new sheds and their state financed estimated functional capacities are as follows:

- Burnett County (650 tons)
- St. Croix County (1,800 tons)
- Pierce County (1,000 tons)
- Jackson County (2,400 tons)
- Pepin County (1,050 tons)

WisDOT is planning on abandoning the following sheds within the next three years:

- Clark County (1,000 tons)
- Jackson County (240 tons)
- Pepin County (200 tons)
- Polk County (1,200 tons)

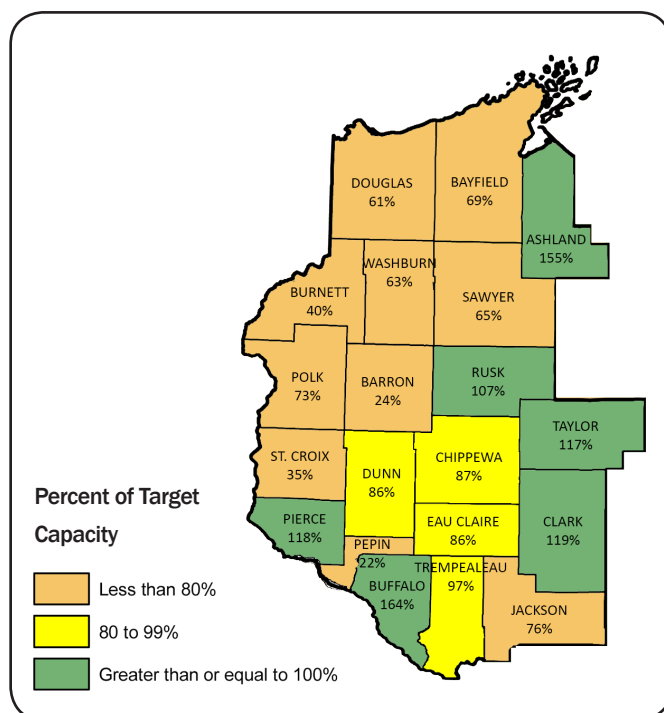


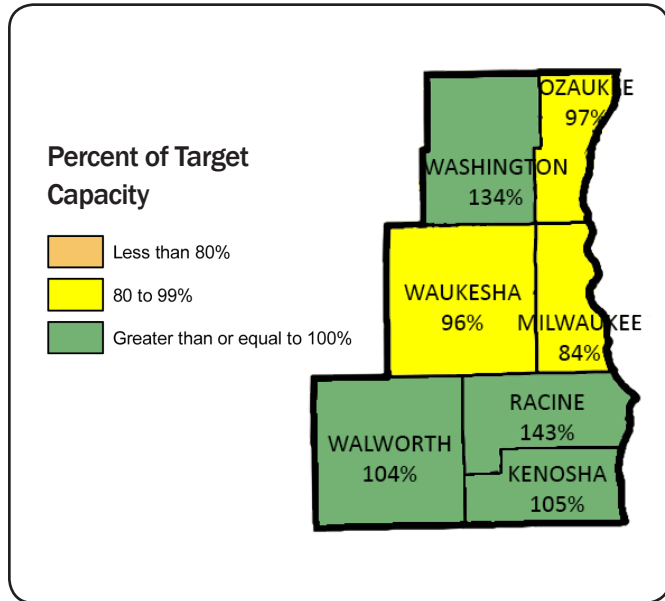
Table 2.4 Northwest Region Capacity Needs

County	Current State Financed Functional Capacity	Target Capacity (125% of average use)	Capacity Needed to Meet Target
Saint Croix	4,339 tons	12,332 tons	7,993 tons
Barron	1,120 tons	4,771 tons	3,651 tons
Douglas	5,504 tons	8,993 tons	3,489 tons
Washburn	3,980 tons	6,343 tons	2,363 tons
Jackson	6,741 tons	8,933 tons	2,192 tons
Bayfield	4,300 tons	6,239 tons	1,939 tons
Polk	5,300 tons	7,231 tons	1,931 tons
Sawyer	3,500 tons	5,400 tons	1,900 tons
Burnett	1,100 tons	2,762 tons	1,662 tons
Chippewa	10,280 tons	11,767 tons	1,487 tons
Dunn	8,675 tons	10,053 tons	1,378 tons
Eau Claire	8,200 tons	9,570 tons	1,370 tons
Pepin	200 tons	908 tons	708 tons
Trempealeau	6,180 tons	6,397 tons	217 tons
Rusk	3,000 tons	2,802 tons	Target Met
Taylor	4,050 tons	3,477 tons	Target Met
Pierce	5,650 tons	4,775 tons	Target Met
Clark	7,000 tons	5,892 tons	Target Met
Ashland	6,049 tons	3,915 tons	Target Met
Buffalo	3,850 tons	2,355 tons	Target Met
NW Total	99,018 tons	124,917 tons	32,281 tons*

* The Capacity Needed to Meet Target is the aggregate shortfall for all counties that do not currently meet the target storage capacity. This number is greater than the difference between the regional total current capacity and the regional total target capacity because some counties already exceed the target storage capacity.

COUNTY FINDINGS - SOUTHEAST REGION

The Southeast region has a state financed functional capacity of 126,184 tons. It has added approximately 6,675 tons of capacity since the last time this report was completed in 2012. Nearly half of this increase occurred in Milwaukee County.



The Southeast region is currently the only region meeting its state financed functional capacity. Current capacity equals about 103 percent of target capacity. Notably, Milwaukee County has the largest current functional capacity in both the region and the state (36,200 tons) and is at 84 percent of its target capacity (43,252 tons).

Four counties (Walworth, Kenosha, Washington and Racine Counties) in the region are exceeding their target capacities. Racine is over 140 percent of its target capacity. Three of the seven counties in the region are underequipped to store quantities equivalent to their current average annual salt use.

Note: WisDOT is planning on constructing one salt shed in the SE region over the next three years. This shed is not included in the table below. The location of the new shed and its state financed estimated functional capacity is as follows:

- Waukesha County (14,000 tons)

Table 2.5. Southeast Region Capacity Needs

County	Current State Financed Functional Capacity	Target Capacity (125% of average use)	Capacity Needed to Meet Target
Milwaukee	36,200 tons	43,252 tons	7,052 tons
Waukesha	18,375 tons	19,161 tons	786 tons
Ozaukee	7,925 tons	8,175 tons	250 tons
Walworth	16,234 tons	15,580 tons	Target Met
Kenosha	11,075 tons	10,588 tons	Target Met
Washington	16,575 tons	13,739 tons	Target Met
Racine	18,000 tons	12,588 tons	Target Met
SE Total	126,184 tons	123,082 tons	8,088 tons*

* The Capacity Needed to Meet Target is the aggregate shortfall for all counties that do not currently meet the target storage capacity. This number is greater than the difference between the regional total current capacity and the regional total target capacity because some counties already exceed the target storage capacity.

COUNTY FINDINGS - SOUTHWEST REGION

In the Southwest region only five of the region's 16 counties have met their target capacities (Juneau, Crawford, La Crosse, Richland and Lafayette Counties). As a whole, the region's current state financed functional capacity (142,810 tons) equals 84 percent of its target capacity (169,336 tons). This is an improvement since 2012, when functional capacity was at 64 percent of target capacity.

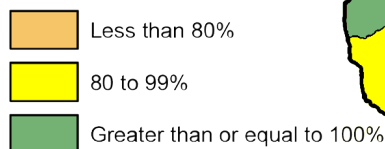
Dane County has the largest capacity deficit in the region. To meet the target capacity of 125 percent of the average annual use (169,336 tons), 26,526 tons of storage space must be added.

Eleven of the 16 counties in the region are underequipped to store quantities equivalent to their current average annual salt use.

Note: WisDOT is planning on constructing 17 salt sheds in the SW region over the next three years. These sheds are not included in the table on the following page. The location of the new sheds and their state financed estimated functional capacities are as follows:

- Columbia County (2,000 tons)
- Columbia County (7,000 tons)

Percent of Target Capacity



- Dane County (5,000 tons)
- Dane County (4,500 tons)
- Dane County (7,000 tons)
- Dane County (3,500 tons)
- Green County (3,200 tons)
- Iowa County (3,000 tons)
- Iowa County (1,000 tons)
- Jefferson County (1,450 tons)
- Juneau County (2,500 tons)
- Juneau County (2,500 tons)
- Monroe County (950 tons)
- Rock County (5,000 tons)
- Sauk County (3,500 tons)
- Sauk County (500 tons)
- Vernon County (1,500 tons)

WisDOT is planning on abandoning the following sheds within the next three years:

- Columbia County (900 tons)
- Dane County (1,100 tons)
- Dane County (1,850 tons)
- Dane County (1,850 tons)
- Jefferson County (1,250 tons)
- Jefferson County (2,900 tons)
- Juneau County (550 tons)
- Juneau County (700 tons)

Table 2.6. Southwest Region Capacity Needs

County	Current State Financed Functional Capacity	Target Capacity (125% of average use)	Capacity Needed to Meet Target
Dane	29,950 tons	43,254 tons	13,304 tons
Columbia	14,500 tons	20,963 tons	6,463 tons
Rock	7,000 tons	11,364 tons	4,364 tons
Sauk	7,637 tons	11,098 tons	3,461 tons
Monroe	7,736 tons	10,342 tons	2,606 tons
Vernon	4,000 tons	6,562 tons	2,562 tons
Iowa	4,000 tons	5,976 tons	1,976 tons
Dodge	13,900 tons	15,470 tons	1,570 tons
Grant	7,702 tons	8,672 tons	970 tons
Jefferson	9,500 tons	10,087 tons	587 tons
Green	1,500 tons	2,065 tons	565 tons
Juneau	8,500 tons	7,875 tons	Target Met
Crawford	6,550 tons	4,430 tons	Target Met
Lafayette	4,300 tons	2,131 tons	Target Met
Richland	5,600 tons	2,912 tons	Target Met
LaCrosse	10,435 tons	6,139 tons	Target Met
SW Total	142,810 tons	169,336 tons	38,425 tons*

* The Capacity Needed to Meet Target is the aggregate shortfall for all counties that do not currently meet the target storage capacity. This number is greater than the difference between the regional total current capacity and the regional total target capacity because some counties already exceed the target storage capacity.

3 Annual Inspection

Each year, WisDOT inspects sites across the state where salt and liquid brines are stored for winter road maintenance purposes. The State inspects for a range of conditions and repair needs, generally including features to prevent salt runoff into groundwater and the integrity and condition of the structure, if applicable (e.g. roof, walls, doors, etc.). If there are features missing or in need of repair, the site is considered “out of compliance”.



Salt shed in good repair

These inspections are completed as part of ch. Trans 277, Wis. Adm. Code ("Trans 277") , the purpose of which is to prevent contamination of Wisconsin's surface and groundwater with chlorides from road salt storage facilities and practices. Those subject to Trans 277 include public and private entities that store (indoor or outdoor) more than 1,000 pounds of road salt for use on driveways, roads and parking lots.

In 2016 the state inspected 1,280 such sites, of which 272 are State- or county-owned storage facilities profiled in this report. The remaining sites are owned by municipalities, private businesses (e.g. landscapers), colleges, tribes and other public entities. As the following numbers reveal, the need for investment in storage facilities is greater than simply a need for more storage volume – there is also a need for repair and investment in existing facilities.

Each site monitored by the state generally has multiple subsites, including sheds, stockpiles, and tanks. WisDOT inspected a total of 1,183 subsites in 2016, all of which are within the 272 total sites mentioned above. Of these subsites, 482 are salt storage sheds, 273 are tanks for liquid storage, and the remainder are stockpiles and combined salt/sand storage.

In 2016, 80 (17 percent) of the salt storage subsites were found to be out of compliance. This is down by one percent from the inspection completed in 2012 (where 18 percent were out of compliance). Of the 273 liquid storage tanks, none were deemed out of compliance. In 2012, only 0.8 percent of liquid storage tanks were deemed out of compliance.

In summary, the State- and county-owned facilities that store liquids for use on state and federal highways are in good repair, but one in every six of the 482 salt storage sites is deficient in some way; this metric has only improved marginally from 2012.



"Out of compliance" - salt shed in need of a new roof

4

Salt Shed Conditions

In addition to the annual inspection conducted by WisDOT staff, in 2016 WisDOT hired a consultant to assess each of the 258 State-financed sheds in Wisconsin.

METHODOLOGY - COMPONENT RATING

The consultant inspected each shed and rated each of four shed components (apron and pad; ceiling and roof; walls; and doors) as "excellent", "good", "okay", "poor" or "bad" condition. If a component was rated as "excellent" it received one (1) point, "good" conditions received two (2) points, "okay" conditions received three (3) points, "poor" conditions received four (4) points and "bad" conditions were given five (5) points. Photos were taken of any deficiencies.

METHODOLOGY - WEIGHTING

To summarize the efforts of shed evaluation and identify the sheds that should be the highest priority for repairs or replacement, we weighted each of the four shed components mentioned previously. Shed components were weighted based on their assumed importance in ensuring the shed is optimized for storing salt. Apron and pad was given a weight of one (1), ceiling and roof was weighted ten (10), walls were weighted seven (7) and doors were weighted five (5). As an example, if ceiling and roof conditions are rated as "poor" (four points), with a weight of ten, the component would receive a score of 40.

METHODOLOGY - OVERALL SHED RATING

The weighted components of each shed were summed giving each shed a total score. The total scores of all of the sheds were ranked using an ordinal scale. The mean shed condition rating was 48.57. The highest (worst) score was 88 and the lowest (best) was 23, which is the best possible score indicating that all four shed components were determined to be in excellent condition. To make the numbers more meaningful, four categories were defined using the standard deviation of the overall shed scores (which was 12.85). The four categories and the scores that make up each are defined below:

- Poor (61.42-88.00)
- Declining (48.57-61.41)
- Adequate (35.72-48.56)
- Excellent (23.00-35.71)

The rating scale is a starting point to help identify sheds in the poorest conditions. There are several components that should also be considered when deciding which sheds to replace or repair, such as whether the county has met its target capacity, age of sheds and the capacity of any nearby sheds. The following page includes examples of each of the four components and what a component in "poor" or "bad" condition looks like.

STATEWIDE FINDINGS

Thirteen percent of the State's functional capacity (68,896 tons) is in sheds that are considered to be in poor condition, based on overall shed rating, and need repairs or replacement.

Note: the following sections lists each salt shed by Site ID. WisDOT has a capacity report which lists the address of each shed by site ID, the facility type (shed, dome, etc), design capacity and functional capacity. The report is available by request.

Examples of "Poor" and "Bad" Shed Component Conditions



Cracked walls (Poor - 28 total points)



Severe cracking over entire apron (Bad - 5 total points)



Ceiling trusses are damaged and unrepaired (Poor - 40 total points)



No door present (Bad - 25 total points)



Weathered shingles-curved/missing (Poor - 40 total points)

COUNTY FINDINGS - NORTH CENTRAL REGION

The North Central region is currently able to store 102,521 tons of salt (96 percent of target capacity) in 62 State-financed sheds. Of these 62 sheds, fourteen (25,546 tons of state financed functional capacity) are considered to be in poor condition.

Table 2.7. North Central Region Shed Condition Summary

Shed Rating	Total Functional Capacity	% of Total	State Financed Functional Capacity	% of Total
POOR	28,770 tons	25%	25,546 tons	25%
DECLINING	12,750 tons	11%	11,822 tons	12%
ADEQUATE	57,845 tons	50%	48,573 tons	47%
EXCELLENT	15,040 tons	13%	9,720 tons	9%
NOT RATED	950 tons	1%	6,860 tons	7%
TOTAL	115,355 tons	100%	102,521 tons	100%

Table 2.8. North Central Region Salt Shed Conditions

County	Site ID	Total Functional Capacity	State Financed Functional Capacity	Apron & Pad Score	Ceiling & Roof Score	Wall Score	Door Score	Total Score	Rating
Green Lake	4-24-5-5	400 tons	400 tons	4	40	21	15	80	POOR
Oneida	7-43-1-2	950 tons	950 tons	2	40	28	10	80	POOR
Florence	7-19-6-2	900 tons	900 tons	4	20	28	20	72	POOR
Forest	7-21-155-1	7,650 tons	7,650 tons	4	40	14	10	68	POOR
Vilas	7-63-20-1	1,100 tons	1,100 tons	2	20	21	25	68	POOR
Green Lake	4-24-7-4	650 tons	650 tons	2	40	14	10	66	POOR
Marquette	4-39-138-1	2,000 tons	1,300 tons	2	40	14	10	66	POOR
Marquette	4-39-138-5	2,200 tons	2,200 tons	2	40	14	10	66	POOR
Menominee	3-73-85-1	1,750 tons	1,750 tons	2	30	14	20	66	POOR
Oneida	7-43-1-5	7,650 tons	5,126 tons	2	40	14	10	66	POOR
Price	7-50-17-1	700 tons	700 tons	2	40	14	10	66	POOR
Waupaca	4-68-112-1	1,350 tons	1,350 tons	2	30	21	10	63	POOR
Forest	7-21-110-1	870 tons	870 tons	4	20	28	10	62	POOR
Vilas	7-63-20-2	600 tons	600 tons	3	20	14	25	62	POOR
Marquette	4-39-42-1	1,300 tons	1,300 tons	2	20	14	25	61	DECLINING
Oneida	7-43-2-2	900 tons	900 tons	2	20	28	10	60	DECLINING
Wood	4-71-54-1	1,500 tons	812 tons	3	20	21	15	59	DECLINING
Florence	7-19-106-2	200 tons	200 tons	2	20	14	20	56	DECLINING
Iron	7-26-24-3	7,650 tons	7,650 tons	2	30	14	10	56	DECLINING
Waupaca	4-68-17-2	1,200 tons	960 tons	2	30	14	10	56	DECLINING
Adams	4-01-7-1	550 tons	550 tons	4	20	14	10	48	ADEQUATE
Waushara	4-69-56-5	430 tons	430 tons	4	20	14	10	48	ADEQUATE
Wood	4-71-51-4	1,700 tons	1,700 tons	4	20	14	10	48	ADEQUATE
Wood	4-71-55-2	700 tons	234 tons	4	20	14	10	48	ADEQUATE
Adams	4-01-217-1	1,575 tons	1,575 tons	3	20	14	10	47	ADEQUATE

County	Site ID	Total Functional Capacity	State Financed Functional Capacity	Apron & Pad Score	Ceiling & Roof Score	Wall Score	Door Score	Total Score	Rating
Iron	7-26-23-2	1,600 tons	1,600 tons	3	20	14	10	47	ADEQUATE
Marathon	4-37-17-1	800 tons	704 tons	3	20	14	10	47	ADEQUATE
Shawano	3-58-97-2	440 tons	440 tons	3	20	14	10	47	ADEQUATE
Waushara	4-69-57-8	400 tons	400 tons	3	20	14	10	47	ADEQUATE
Waushara	4-69-59-2	600 tons	600 tons	3	20	14	10	47	ADEQUATE
Wood	4-71-55-3	700 tons	700 tons	3	20	14	10	47	ADEQUATE
Wood	4-71-55-4	700 tons	700 tons	3	20	14	10	47	ADEQUATE
Adams	4-01-200-1	3,000 tons	1,500 tons	2	20	14	10	46	ADEQUATE
Forest	7-21-9-3	450 tons	450 tons	2	20	14	10	46	ADEQUATE
Green Lake	4-24-5-7	400 tons	400 tons	2	20	14	10	46	ADEQUATE
Green Lake	4-24-7-3	400 tons	400 tons	2	20	14	10	46	ADEQUATE
Langlade	7-34-12-1	200 tons	200 tons	2	20	14	10	46	ADEQUATE
Langlade	7-34-12-2	900 tons	900 tons	2	20	14	10	46	ADEQUATE
Langlade	7-34-13-1	4,100 tons	3,239 tons	2	20	14	10	46	ADEQUATE
Lincoln	7-35-15-4	850 tons	850 tons	2	20	14	10	46	ADEQUATE
Marathon	4-37-183-1	3,300 tons	2,310 tons	2	20	14	10	46	ADEQUATE
Marathon	4-37-184-1	2,700 tons	2,214 tons	2	20	14	10	46	ADEQUATE
Oneida	7-43-126-1	600 tons	600 tons	2	20	14	10	46	ADEQUATE
Oneida	7-43-2-1	600 tons	600 tons	2	20	14	10	46	ADEQUATE
Portage	4-49-3-3	4,250 tons	4,250 tons	2	20	14	10	46	ADEQUATE
Price	7-50-101-1	5,200 tons	2,860 tons	2	20	14	10	46	ADEQUATE
Shawano	3-58-99-4	3,500 tons	3,500 tons	2	20	14	10	46	ADEQUATE
Vilas	7-63-21-5	7,650 tons	7,650 tons	2	20	14	10	46	ADEQUATE
Waupaca	4-68-18-1	1,000 tons	1,000 tons	2	20	14	10	46	ADEQUATE
Waupaca	4-68-20-3	900 tons	900 tons	2	20	14	10	46	ADEQUATE
Waushara	4-69-57-1	400 tons	400 tons	2	20	14	10	46	ADEQUATE
Waushara	4-69-57-2	550 tons	550 tons	2	20	14	10	46	ADEQUATE
Wood	4-71-51-1	2,300 tons	1,219 tons	2	20	14	10	46	ADEQUATE
Lincoln	7-35-14-4	4,400 tons	2,948 tons	2	10	14	10	36	ADEQUATE
Marathon	4-37-8-2	3,500 tons	2,345 tons	2	10	14	5	31	EXCELLENT
Marathon	4-37-9-1	6,000 tons	2,820 tons	2	10	14	5	31	EXCELLENT
Portage	4-49-3-4	5,540 tons	3,355 tons	2	10	7	10	29	EXCELLENT
Portage	4-49-0-1	unavailable	1,200 tons	1	10	7	5	23	EXCELLENT
Florence	7-19-?-?	unavailable	2,970 tons	not rated	not rated	not rated	not rated	not rated	not rated
Lincoln	7-35-14-2	950 tons	950 tons	not rated	not rated	not rated	not rated	not rated	not rated
Oneida	7-43-?-?	unavailable	600 tons	not rated	not rated	not rated	not rated	not rated	not rated
Shawano	3-58-326-2	unavailable	2,340 tons	not rated	not rated	not rated	not rated	not rated	not rated
NC Averages	--	--	--	2.4	22.6	15.2	11.2	51.4	DECLINING
NC Totals	--	115,355 tons	102,521 tons	--	--	--	--	--	

COUNTY FINDINGS - NORTHEAST REGION

The Northeast region is able to store 74,176 tons of salt (96 percent of target capacity), in 45 salt sheds. Of these 45 sheds, only two (1,487 tons of state financed functional capacity) are considered to be in poor condition.

Table 2.9. Northeast Region Shed Condition Summary

Shed Rating	Total Functional Capacity	% of Total	State Financed Functional Capacity	% of Total
POOR	3,140 tons	3%	1,487 tons	2%
DECLINING	12,350 tons	13%	7,954 tons	11%
ADEQUATE	53,540 tons	55%	40,143 tons	54%
EXCELLENT	22,580 tons	23%	21,705 tons	29%
NOT RATED	5,500 tons	6%	2,887 tons	4%
TOTAL	97,110 tons	100%	74,176 tons	100%

Table 2.10. Northeast Region Salt Shed Conditions

County	Site ID	Total Functional Capacity	State Financed Functional Capacity	Apron & Pad Score	Ceiling & Roof Score	Wall Score	Door Score	Total Score	Rating
Oconto	3-42-305-1	240 tons	240 tons	4	40	21	10	75	POOR
Door	3-15-370-1	2,900 tons	1,247 tons	3	30	7	25	65	POOR
Brown	3-05-88-4	1,460 tons	1,460 tons	4	30	14	10	58	DECLINING
Fond du Lac	2-20-202-1	4,000 tons	2,000 tons	3	30	14	10	57	DECLINING
Marinette	3-38-115-5	2,500 tons	2,500 tons	2	20	14	20	56	DECLINING
Manitowoc	3-36-22-5	1,190 tons	1,190 tons	1	20	21	10	52	DECLINING
Sheboygan	3-59-315-5	1,000 tons	150 tons	3	20	14	15	52	DECLINING
Brown	3-05-87-1	1,200 tons	504 tons	2	20	14	15	51	DECLINING
Sheboygan	3-59-315-4	1,000 tons	150 tons	2	20	14	15	51	DECLINING
Fond du Lac	2-20-201-6	6,300 tons	4,095 tons	3	20	14	10	47	ADEQUATE
Marinette	3-38-111-3	1,500 tons	1,500 tons	3	20	14	10	47	ADEQUATE
Sheboygan	3-59-315-1	1,500 tons	1,500 tons	3	20	14	10	47	ADEQUATE
Winnebago	3-70-352-1	3,000 tons	3,000 tons	3	20	14	10	47	ADEQUATE
Fond du Lac	2-20-201-5	6,000 tons	4,200 tons	2	10	14	20	46	ADEQUATE
Manitowoc	3-36-23-1	1,200 tons	600 tons	2	20	14	10	46	ADEQUATE
Manitowoc	3-36-24-4	1,190 tons	1,190 tons	2	20	14	10	46	ADEQUATE
Marinette	3-38-110-5	2,500 tons	2,500 tons	2	20	14	10	46	ADEQUATE
Oconto	3-42-52-1	3,200 tons	3,200 tons	2	20	14	10	46	ADEQUATE
Oconto	3-42-53-4	3,200 tons	3,200 tons	2	20	14	10	46	ADEQUATE
Outagamie	3-44-242-1	4,000 tons	2,000 tons	2	20	14	10	46	ADEQUATE
Sheboygan	3-59-55-5	1,500 tons	300 tons	2	20	14	10	46	ADEQUATE
Sheboygan	3-59-55-7	1,500 tons	1,500 tons	2	20	14	10	46	ADEQUATE
Sheboygan	3-59-58-6	1,180 tons	1,180 tons	2	20	14	10	46	ADEQUATE

County	Site ID	Total Functional Capacity	State Financed Functional Capacity	Apron & Pad Score	Ceiling & Roof Score	Wall Score	Door Score	Total Score	Rating
Sheboygan	3-59-59-1	750 tons	248 tons	2	20	14	10	46	ADEQUATE
Sheboygan	3-59-59-5	1,180 tons	1,180 tons	2	20	14	10	46	ADEQUATE
Winnebago	3-70-342-2	6,000 tons	3,480 tons	2	20	14	10	46	ADEQUATE
Manitowoc	3-36-348-1	4,140 tons	2,070 tons	1	20	14	10	45	ADEQUATE
Manitowoc	3-36-360-1	800 tons	800 tons	1	20	14	10	45	ADEQUATE
Sheboygan	3-59-58-3	2,000 tons	1,500 tons	1	20	14	10	45	ADEQUATE
Brown	3-05-91-3	900 tons	900 tons	4	20	14	5	43	ADEQUATE
Winnebago*	3-70-297-1	unavailable	unavailable	5	10	21	5	41	ADEQUATE
Brown	3-05-86-4	2,230 tons	2,230 tons	1	10	14	5	30	EXCELLENT
Door	3-15-360-1	1,000 tons	1,000 tons	2	10	7	10	29	EXCELLENT
Outagamie	3-44-7-1	600 tons	600 tons	2	10	7	10	29	EXCELLENT
Outagamie	3-44-7-4	3,000 tons	3,000 tons	2	10	7	10	29	EXCELLENT
Kewaunee	3-31-256-1	250 tons	125 tons	2	10	7	5	24	EXCELLENT
Outagamie	3-44-9-1	1,500 tons	750 tons	2	10	7	5	24	EXCELLENT
Brown	3-05-391-1	3,000 tons	3,000 tons	1	10	7	5	23	EXCELLENT
Brown	3-05-86-7	5,450 tons	5,450 tons	1	10	7	5	23	EXCELLENT
Calumet	3-08-74-5	1,100 tons	1,100 tons	1	10	7	5	23	EXCELLENT
Door	3-15-355-1	1,000 tons	1,000 tons	1	10	7	5	23	EXCELLENT
Outagamie	3-44-2-1	450 tons	450 tons	1	10	7	5	23	EXCELLENT
Winnebago	3-70-393-1	3,000 tons	3,000 tons	1	10	7	5	23	EXCELLENT
Fond du Lac	2-20-204-3	1,600 tons	1,600 tons	not rated	not rated	not rated	not rated	not rated	not rated
Fond du Lac	2-20-536-1	3,900 tons	1,287 tons	not rated	not rated	not rated	not rated	not rated	not rated
NE Averages	--	--	--	2.1	17.9	12.5	9.9	42.4	ADEQUATE
NE Totals	--	97,110 tons	74,176 tons	--	--	--	--	--	

*Shed is now part of a highway project and is no longer used.

COUNTY FINDINGS - NORTHWEST REGION

The Northwest region's current state financed functional capacity of 99,018 tons (79 percent of target capacity) is stored in 77 sheds. Of these 77 sheds, seven (5,415 tons of state financed functional capacity) are in poor condition.

Table 2.11. Northwest Region Shed Condition Summary

Shed Rating	Total Functional Capacity	% of Total	State Financed Functional Capacity	% of Total
POOR	5,700 tons	5%	5,415 tons	5%
DECLINING	21,010 tons	18%	17,974 tons	18%
ADEQUATE	74,195 tons	63%	61,080 tons	62%
EXCELLENT	14,000 tons	12%	12,589 tons	13%
NOT RATED	1,960 tons	2%	1,960 tons	2%
TOTAL	116,865 tons	100%	99,018 tons	100%

Table 2.12. Northwest Region Salt Shed Conditions

County	Site ID	Total Functional Capacity	State Financed Functional Capacity	Apron & Pad Score	Ceiling & Roof Score	Wall Score	Door Score	Total Score	Rating
Jackson	5-27-602-2	400 tons	240 tons	4	30	28	20	82	POOR
Eau Claire	6-18-1-1	1,200 tons	1,200 tons	2	40	28	10	80	POOR
Polk	8-48-41-1	1,200 tons	1,200 tons	2	40	28	10	80	POOR
Chippewa	6-09-7-4	1,250 tons	1,125 tons	1	40	28	10	79	POOR
Dunn	6-17-3-1	325 tons	325 tons	2	40	21	15	78	POOR
Dunn	6-17-2-1	325 tons	325 tons	2	20	35	15	72	POOR
Clark	6-10-1-1	1,000 tons	1,000 tons	2	20	28	20	70	POOR
Jackson	5-27-601-2	5,000 tons	3,700 tons	2	40	7	10	59	DECLINING
Douglas	8-16-29-1	4,960 tons	3,224 tons	4	30	14	10	58	DECLINING
Eau Claire	6-18-1-2	1,900 tons	1,900 tons	2	20	21	15	58	DECLINING
Buffalo	5-06-500-2	500 tons	500 tons	2	30	14	10	56	DECLINING
Taylor	6-60-2-1	150 tons	150 tons	2	20	14	20	56	DECLINING
Dunn	6-17-1-5	5,000 tons	5,000 tons	2	20	21	10	53	DECLINING
Trempealeau	5-61-803-1	3,500 tons	3,500 tons	5	20	14	10	49	DECLINING
Barron	8-03-10-2	160 tons	160 tons	4	20	14	10	48	ADEQUATE
Pierce	6-47-1-4	3,500 tons	3,500 tons	4	20	14	10	48	ADEQUATE
Pierce	6-47-36-1	500 tons	500 tons	4	20	14	10	48	ADEQUATE
Pierce	6-47-7-1	200 tons	200 tons	3	20	14	10	47	ADEQUATE
Trempealeau	5-61-830-2	900 tons	810 tons	3	20	14	10	47	ADEQUATE
Ashland	8-02-2-1	320 tons	320 tons	2	20	14	10	46	ADEQUATE
Ashland	8-02-3-1	480 tons	480 tons	2	20	14	10	46	ADEQUATE
Ashland	8-02-63-1	5,520 tons	4,449 tons	2	20	14	10	46	ADEQUATE
Ashland	8-02-64-1	800 tons	800 tons	2	20	14	10	46	ADEQUATE

County	Site ID	Total Functional Capacity	State Financed Functional Capacity	Apron & Pad Score	Ceiling & Roof Score	Wall Score	Door Score	Total Score	Rating
Bayfield	8-04-14-1	720 tons	720 tons	2	20	14	10	46	ADEQUATE
Bayfield	8-04-16-1	240 tons	240 tons	2	20	14	10	46	ADEQUATE
Bayfield	8-04-17-1	240 tons	240 tons	2	20	14	10	46	ADEQUATE
Bayfield	8-04-19-1	3,100 tons	3,100 tons	2	20	14	10	46	ADEQUATE
Burnett	8-07-25-1	1,100 tons	1,100 tons	2	20	14	10	46	ADEQUATE
Chippewa	6-09-24-1	1,200 tons	1,200 tons	2	20	14	10	46	ADEQUATE
Douglas	8-16-27-1	320 tons	320 tons	2	20	14	10	46	ADEQUATE
Douglas	8-16-28-1	320 tons	320 tons	2	20	14	10	46	ADEQUATE
Douglas	8-16-30-1	320 tons	320 tons	2	20	14	10	46	ADEQUATE
Douglas	8-16-30-4	1,000 tons	1,000 tons	2	20	14	10	46	ADEQUATE
Douglas	8-16-31-1	320 tons	320 tons	2	20	14	10	46	ADEQUATE
Dunn	6-17-1-1	1,700 tons	850 tons	2	20	14	10	46	ADEQUATE
Dunn	6-17-3-2	175 tons	175 tons	2	20	14	10	46	ADEQUATE
Eau Claire	6-18-1-6	3,900 tons	3,900 tons	2	20	14	10	46	ADEQUATE
Jackson	5-27-601-1	800 tons	640 tons	2	20	14	10	46	ADEQUATE
Jackson	5-27-601-3	2,100 tons	441 tons	2	20	14	10	46	ADEQUATE
Jackson	5-27-602-1	800 tons	720 tons	2	20	14	10	46	ADEQUATE
Pierce	6-47-1-3	850 tons	850 tons	2	20	14	10	46	ADEQUATE
Pierce	6-47-3-1	200 tons	200 tons	2	20	14	10	46	ADEQUATE
Pierce	6-47-4-1	200 tons	200 tons	2	20	14	10	46	ADEQUATE
Pierce	6-47-6-1	200 tons	200 tons	2	20	14	10	46	ADEQUATE
Polk	8-48-21-1	4,100 tons	4,100 tons	2	20	14	10	46	ADEQUATE
Rusk	8-54-43-5	3,000 tons	3,000 tons	2	20	14	10	46	ADEQUATE
Saint Croix	6-55-1-3	850 tons	850 tons	2	20	14	10	46	ADEQUATE
Saint Croix	6-55-4-1	150 tons	150 tons	2	20	14	10	46	ADEQUATE
Sawyer	8-57-45-5	1,600 tons	1,600 tons	2	20	14	10	46	ADEQUATE
Sawyer	8-57-47-1	300 tons	300 tons	2	20	14	10	46	ADEQUATE
Sawyer	8-57-48-4	1,600 tons	1,600 tons	2	20	14	10	46	ADEQUATE
Taylor	6-60-1-6	3,000 tons	2,100 tons	2	20	14	10	46	ADEQUATE
Taylor	6-60-3-1	1,800 tons	1,800 tons	2	20	14	10	46	ADEQUATE
Trempealeau	5-61-805-1	850 tons	510 tons	2	20	14	10	46	ADEQUATE
Trempealeau	5-61-808-1	1,000 tons	1,000 tons	2	20	14	10	46	ADEQUATE
Washburn	8-65-97-1	480 tons	480 tons	2	20	14	10	46	ADEQUATE
Washburn	8-65-98-1	10,000 tons	3,500 tons	2	20	14	10	46	ADEQUATE
Clark	6-10-2-2	5,000 tons	5,000 tons	1	20	14	10	45	ADEQUATE
Chippewa	6-09-5-2	1,250 tons	1,125 tons	1	20	7	15	43	ADEQUATE
Chippewa	6-09-7-1	780 tons	780 tons	1	10	21	10	42	ADEQUATE
Dunn	6-17-1-2	1,000 tons	1,000 tons	1	10	21	10	42	ADEQUATE
Buffalo	5-06-501-1	1,500 tons	1,200 tons	2	20	7	10	39	ADEQUATE
Buffalo	5-06-502-6	2,150 tons	2,150 tons	2	20	7	10	39	ADEQUATE

County	Site ID	Total Functional Capacity	State Financed Functional Capacity	Apron & Pad Score	Ceiling & Roof Score	Wall Score	Door Score	Total Score	Rating
Pepin	6-46-1-1	1,000 tons	200 tons	2	20	7	10	39	ADEQUATE
Trempealeau	5-61-807-1	600 tons	360 tons	4	10	14	10	38	ADEQUATE
Chippewa	6-09-4-4	5,500 tons	4,950 tons	1	10	14	10	35	EXCELLENT
Saint Croix	6-55-22-1	1,500 tons	1,200 tons	2	10	7	10	29	EXCELLENT
Saint Croix	6-55-21-1	700 tons	469 tons	1	10	7	10	28	EXCELLENT
Chippewa	6-09-27-1	1,100 tons	1,100 tons	2	10	7	5	24	EXCELLENT
Dunn	6-17-33-2	1,000 tons	1,000 tons	2	10	7	5	24	EXCELLENT
Saint Croix	6-55-5-1	1,000 tons	670 tons	2	10	7	5	24	EXCELLENT
Eau Claire	6-18-69-1	1,200 tons	1,200 tons	1	10	7	5	23	EXCELLENT
Jackson	5-27-903-1	1,000 tons	1,000 tons	1	10	7	5	23	EXCELLENT
Saint Croix	6-55-89-1	1,000 tons	1,000 tons	1	10	7	5	23	EXCELLENT
Barron	8-03-2-1	480 tons	480 tons	not rated	not rated	not rated	not rated	not rated	not rated
Barron	8-03-10-1	480 tons	480 tons	not rated	not rated	not rated	not rated	not rated	not rated
Clark	6-10-3-4	1,000 tons	1,000 tons	not rated	not rated	not rated	not rated	not rated	not rated
NW Averages	--	--	--	2.1	20.1	14.5	10.3	47.0	ADEQUATE
NW Totals	--	116,865 tons	99,018 tons	--	--	--	--	--	

COUNTY FINDINGS - SOUTHEAST REGION

The Southeast region's current state financed functional capacity of 126,184 tons (103 percent of target capacity) is stored in 26 sheds. Of these 26 sheds, three (8,875 tons of state financed functional capacity) are in poor condition.

Table 2.13. Southeast Region Shed Condition Summary

Shed Rating	Total Functional Capacity	% of Total	State Financed Functional Capacity	% of Total
POOR	14,900 tons	9%	8,875 tons	7%
DECLINING	40,450 tons	23%	27,425 tons	22%
ADEQUATE	49,575 tons	28%	39,845 tons	32%
EXCELLENT	39,100 tons	22%	21,535 tons	17%
NOT RATED	30,500 tons	17%	28,504 tons	23%
TOTAL	174,525 tons	100%	126,184 tons	100%

Table 2.14. Southeast Region Salt Shed Conditions

County	Site ID	Total Functional Capacity	State Financed Functional Capacity	Apron & Pad Score	Ceiling & Roof Score	Wall Score	Door Score	Total Score	Rating
Waukesha	2-67-205-1	3,000 tons	1,500 tons	2	30	14	25	71	POOR
Ozaukee	2-45-201-1	9,500 tons	6,175 tons	2	40	14	10	66	POOR
Waukesha	2-67-1-2	2,400 tons	1,200 tons	2	40	14	10	66	POOR
Kenosha	2-30-201-1	12,000 tons	6,000 tons	2	20	14	25	61	DECLINING
Waukesha	2-67-201-1	4,500 tons	2,700 tons	2	20	14	25	61	DECLINING
Waukesha	2-67-4-1	950 tons	475 tons	2	20	14	25	61	DECLINING
Waukesha	2-67-2-2	3,000 tons	1,500 tons	1	20	14	25	60	DECLINING
Racine	2-51-2-6	4,000 tons	4,000 tons	4	30	14	10	58	DECLINING
Waukesha	2-67-4-2	3,000 tons	1,500 tons	2	20	7	25	54	DECLINING
Racine	2-51-2-4	9,500 tons	9,500 tons	5	30	7	10	52	DECLINING
Ozaukee	2-45-203-6	3,500 tons	1,750 tons	5	20	14	10	49	DECLINING
Kenosha	2-30-1-1	5,075 tons	5,075 tons	2	20	14	10	46	ADEQUATE
Walworth	2-64-109-1	4,000 tons	3,120 tons	5	20	7	10	42	ADEQUATE
Milwaukee	2-40-205-1	12,500 tons	10,000 tons	2	20	7	10	39	ADEQUATE
Walworth	2-64-202-1	3,000 tons	2,250 tons	2	20	7	10	39	ADEQUATE
Waukesha	2-67-201-11	9,500 tons	9,500 tons	2	20	7	10	39	ADEQUATE
Racine	2-51-1-1	1,500 tons	1,500 tons	2	10	14	10	36	ADEQUATE
Walworth	2-64-203-3	14,000 tons	8,400 tons	2	10	14	10	36	ADEQUATE
Washington	2-66-103-1	11,050 tons	5,525 tons	3	10	7	10	30	EXCELLENT
Walworth	2-64-203-11	14,000 tons	1,960 tons	4	10	7	5	26	EXCELLENT
Racine	2-51-1-11	3,000 tons	3,000 tons	2	10	7	5	24	EXCELLENT
Washington	2-66-102-3	11,050 tons	11,050 tons	1	10	7	5	23	EXCELLENT
Milwaukee	2-40-202-1	12,500 tons	10,000 tons	not rated	not rated	not rated	not rated	not rated	not rated
Milwaukee	2-40-206-14	18,000 tons	16,200 tons	not rated	not rated	not rated	not rated	not rated	not rated
Walworth	2-64-203-2	unknown	504 tons	not rated	not rated	not rated	not rated	not rated	not rated
Washington	2-66-109-4	unknown	1,800 tons	not rated	not rated	not rated	not rated	not rated	not rated
SE Averages	--	--	--	2.5	20.5	10.8	13.4	47.2	ADEQUATE
SE Totals	--	174,525 tons	126,184 tons	--	--	--	--	--	

COUNTY FINDINGS - SOUTHWEST REGION

The Southwest region's current state financed functional capacity of 146,060 tons (86 percent of target capacity) is stored in 67 sheds. Of these 67 sheds, 13 (28,310 tons of state financed functional capacity) are in poor condition.

Table 2.15. Southwest Region Shed Condition Summary

Shed Rating	Total Functional Capacity	% of Total	State Financed Functional Capacity	% of Total
POOR	30,050 tons	20%	28,310 tons	20%
DECLINING	20,620 tons	14%	17,715 tons	12%
ADEQUATE	78,840 tons	53%	69,045 tons	48%
EXCELLENT	10,340 tons	7%	8,840 tons	6%
NOT RATED	9,900 tons	7%	18,900 tons	13%
TOTAL	149,750 tons	100%	142,810 tons	100%

Table 2.16. Southwest Region Salt Shed Conditions

County	Site ID	Total Functional Capacity	State Financed Functional Capacity	Apron & Pad Score	Ceiling & Roof Score	Wall Score	Door Score	Total Score	Rating
Columbia	1-11-236-1	800 tons	800 tons	2	40	21	25	88	POOR
Juneau	4-29-85-2	6,500 tons	6,500 tons	3	40	14	20	77	POOR
Lafayette	1-33-174-3	1,800 tons	1,800 tons	4	20	28	25	77	POOR
Juneau	4-29-86-1	750 tons	750 tons	2	40	21	10	73	POOR
Dane	1-13-266-1	1,850 tons	1,850 tons	5	40	14	10	69	POOR
Juneau	4-29-144-1	550 tons	550 tons	3	30	14	20	67	POOR
La Crosse	5-32-653-1	6,000 tons	6,000 tons	3	40	14	10	67	POOR
Richland	5-52-767-1	200 tons	200 tons	3	40	14	10	67	POOR
Sauk	1-56-120-3	2,000 tons	2,000 tons	2	40	14	10	66	POOR
Dodge	1-14-33-1	1,000 tons	1,000 tons	5	20	28	10	63	POOR
Green	1-23-49-2	3,000 tons	1,500 tons	4	20	14	25	63	POOR
La Crosse	5-32-651-1	600 tons	360 tons	4	30	14	15	63	POOR
Richland	5-52-768-1	5,000 tons	5,000 tons	4	20	14	25	63	POOR
Columbia	1-11-5-2	1,800 tons	900 tons	2	20	14	25	61	DECLINING
Grant	1-22-387-2	2,300 tons	2,300 tons	2	30	14	15	61	DECLINING
Grant	1-22-197-1	170 tons	170 tons	3	20	21	15	59	DECLINING
Crawford	5-12-550-2	450 tons	450 tons	4	30	14	10	58	DECLINING
Monroe	5-41-702-1	250 tons	0 tons	2	20	21	15	58	DECLINING
Monroe	5-41-702-3	250 tons	63 tons	2	20	21	15	58	DECLINING
Juneau	4-29-204-2	700 tons	700 tons	3	30	14	10	57	DECLINING
La Crosse	5-32-681-1	1,200 tons	1,200 tons	3	30	14	10	57	DECLINING
Columbia	1-11-346-1	4,000 tons	4,000 tons	2	30	14	10	56	DECLINING
Grant	1-22-478-3	2,800 tons	1,232 tons	2	30	14	10	56	DECLINING
La Crosse	5-32-651-4	2,000 tons	2,000 tons	2	30	14	10	56	DECLINING
Lafayette	1-33-477-1	1,500 tons	1,500 tons	2	30	14	10	56	DECLINING
Sauk	1-56-119-2	1,800 tons	1,800 tons	2	30	14	10	56	DECLINING
Richland	5-52-766-2	400 tons	400 tons	3	20	21	10	54	DECLINING

County	Site ID	Total Functional Capacity	State Financed Functional Capacity	Apron & Pad Score	Ceiling & Roof Score	Wall Score	Door Score	Total Score	Rating
Rock	1-53-481-1	1,000 tons	1,000 tons	2	20	21	10	53	DECLINING
Crawford	5-12-555-4	200 tons	200 tons	4	20	14	10	48	ADEQUATE
Crawford	5-12-556-1	300 tons	300 tons	4	20	14	10	48	ADEQUATE
Dane	1-13-1-1	1,100 tons	1,100 tons	4	20	14	10	48	ADEQUATE
Sauk	1-56-292-1	500 tons	500 tons	4	20	14	10	48	ADEQUATE
Crawford	5-12-553-1	300 tons	300 tons	3	20	14	10	47	ADEQUATE
Dodge	1-14-34-1	1,000 tons	1,000 tons	3	20	14	10	47	ADEQUATE
La Crosse	5-32-652-2	300 tons	225 tons	3	20	14	10	47	ADEQUATE
Monroe	5-41-701-1	1,800 tons	1,260 tons	3	20	14	10	47	ADEQUATE
Monroe	5-41-701-3	400 tons	280 tons	3	20	14	10	47	ADEQUATE
Monroe	5-41-701-5	300 tons	0 tons	3	20	14	10	47	ADEQUATE
Monroe	5-41-725-725	6,300 tons	5,733 tons	3	20	14	10	47	ADEQUATE
Columbia	1-11-236-2	8,000 tons	8,000 tons	2	20	14	10	46	ADEQUATE
Columbia	1-11-4-2	800 tons	800 tons	2	20	14	10	46	ADEQUATE
Crawford	5-12-554-1	300 tons	300 tons	2	20	14	10	46	ADEQUATE
Crawford	5-12-576-1	2,000 tons	2,000 tons	2	20	14	10	46	ADEQUATE
Dane	1-13-12-2	1,400 tons	1,400 tons	2	20	14	10	46	ADEQUATE
Dane	1-13-262-1	1,850 tons	1,850 tons	2	20	14	10	46	ADEQUATE
Dane	1-13-479-1	14,000 tons	12,600 tons	2	20	14	10	46	ADEQUATE
Dane	1-13-486-1	10,000 tons	8,000 tons	2	20	14	10	46	ADEQUATE
Dane	1-13-501-1	4,500 tons	3,150 tons	2	20	14	10	46	ADEQUATE
Iowa	1-25-73-5	4,000 tons	4,000 tons	2	20	14	10	46	ADEQUATE
La Crosse	5-32-654-2	650 tons	650 tons	2	20	14	10	46	ADEQUATE
Lafayette	1-33-510-1	1,500 tons	1,000 tons	2	20	14	10	46	ADEQUATE
Monroe	5-41-704-4	400 tons	400 tons	2	20	14	10	46	ADEQUATE
Vernon	5-62-889-3	4,000 tons	4,000 tons	2	20	14	10	46	ADEQUATE
Dodge	1-14-488-1	8,000 tons	5,600 tons	5	20	7	10	42	ADEQUATE
Rock	1-53-63-3	2,000 tons	2,000 tons	2	20	7	10	39	ADEQUATE
Rock	1-53-68-1	1,000 tons	1,000 tons	2	20	7	10	39	ADEQUATE
Sauk	1-56-292-3	1,940 tons	1,397 tons	2	20	7	10	39	ADEQUATE
Sauk	1-56-118-3	1,940 tons	1,940 tons	2	10	7	10	29	EXCELLENT
Jefferson	1-28-512-1	4,000 tons	2,500 tons	2	10	7	5	24	EXCELLENT
Dodge	1-14-511-1	4,400 tons	4,400 tons	1	10	7	5	23	EXCELLENT
Crawford	5-12-??	unknown	3,000 tons	not rated	not rated	not rated	not rated	not rated	not rated
Dodge	1-14-30-1	1,900 tons	1,900 tons	not rated	not rated	not rated	not rated	not rated	not rated
Grant	1-22-500-1	5,000 tons	4,000 tons	not rated	not rated	not rated	not rated	not rated	not rated
Jefferson	1-28-??	unknown	7,000 tons	not rated	not rated	not rated	not rated	not rated	not rated
Rock	1-53-522-1	3,000 tons	3,000 tons	not rated	not rated	not rated	not rated	not rated	not rated
SW Averages	--	--	--	2.7	23.7	14.5	11.8	52.7	DECLINING
SW Totals	--	149,750 tons	142,810 tons	--	--	--	--	--	

5 Conclusions

STORAGE NEEDS

This report documents a need for more salt storage in the State. Because each county is responsible for maintaining its own supply of salt, it is necessary to consider the storage needs of individual counties. The aggregate shortfall of all counties not yet meeting the target storage capacity is about 101,966 tons. This shortage is offset by the 27 counties that meet or exceed the storage target. Statewide, relative to the target functional capacity, there is a net shortfall of about 56,076 tons of storage capacity. The northwest region is furthest from its target capacity (the region currently has only 79% of its target capacity of 124,917 tons). When building more storage capacity, it may be advantageous to meet some of that need with a regional approach that allows salt to be distributed among multiple counties as the need arises, especially later into the season. During the 2016-2017 winter season WisDOT piloted two individual regional efforts through creation of Area Wide Service Providers (AWSP) for two larger interstates, the goal being a more consistent winter maintenance treatment in a larger area.

The salt shed condition report indicates that 13% of the State's functional storage capacity is made up of sheds that are in poor condition and urgently need repair or replacement. This translates into an additional 69,633 tons of the State's functional storage capacity requiring repair or replacement. The region with the greatest percentage of its storage capacity in poor condition is the southwest region (20 percent of State financed functional capacity is considered to be in poor condition).

Priority for salt shed construction should be focused in the counties with the greatest percentage gap between current and target storage, counties with sheds in poor condition, and to counties with interstate and priority routes. Counties with less than 50% of targeted storage include Kewaunee, Calumet, Barron, Burnett, Pepin and Saint Croix. Of these counties, Saint Croix is the only one with interstate routes.

FINANCIAL NEEDS

A new storage shed, if constructed with a conventional wood frame design, costs about \$75-125 per ton of storage. Larger sheds are more efficient and cost-effective than smaller ones. Assuming the midpoint of this cost range, the 101,966 tons of additional storage needed to meet the target capacity of 125 percent of the average annual use represents a potential cost of about \$10.2 million. To meet capacity for 100 percent of average annual use (480,628 tons), 34,925 tons of additional storage would be needed. This represents a potential cost of approximately \$3.5 million. The 69,633 tons of storage facilities needing repair or replacement could cost up to \$7 million if simply replaced, but some of those deficiencies can be resolved with less costly repairs.

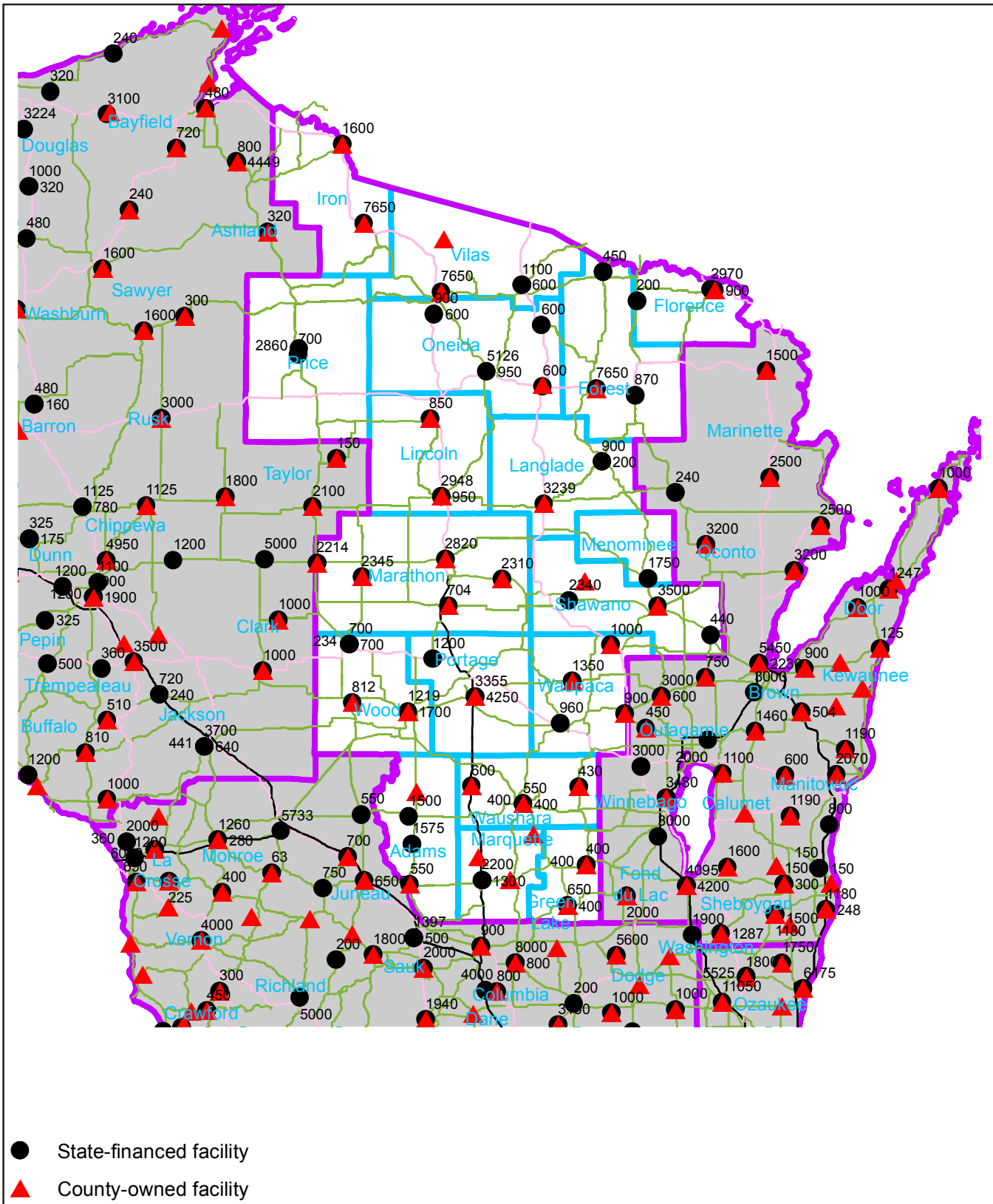
Again note that some of the gap in storage will be offset by the 28 sheds being constructed over the next three years (totaling over 86,000 additional tons of capacity).

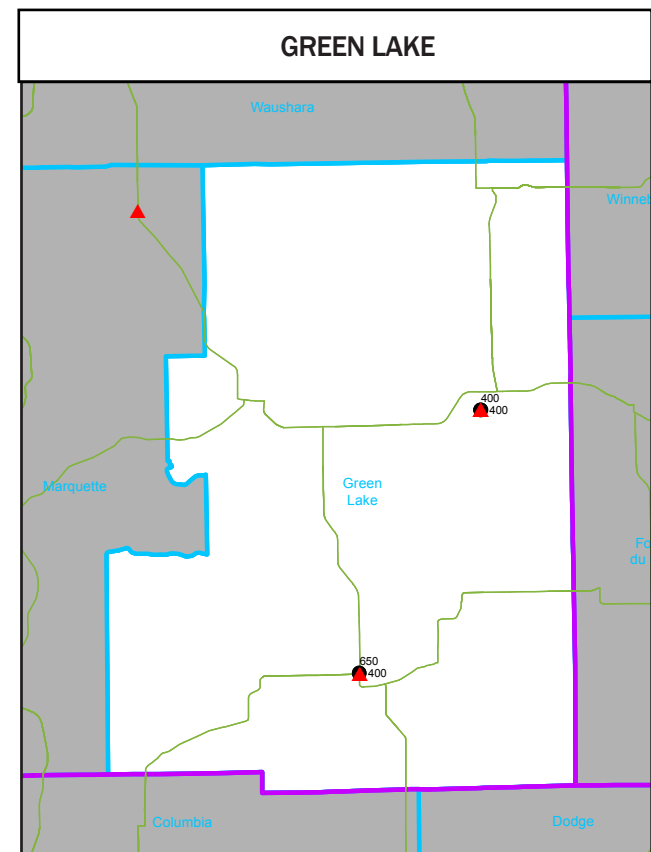
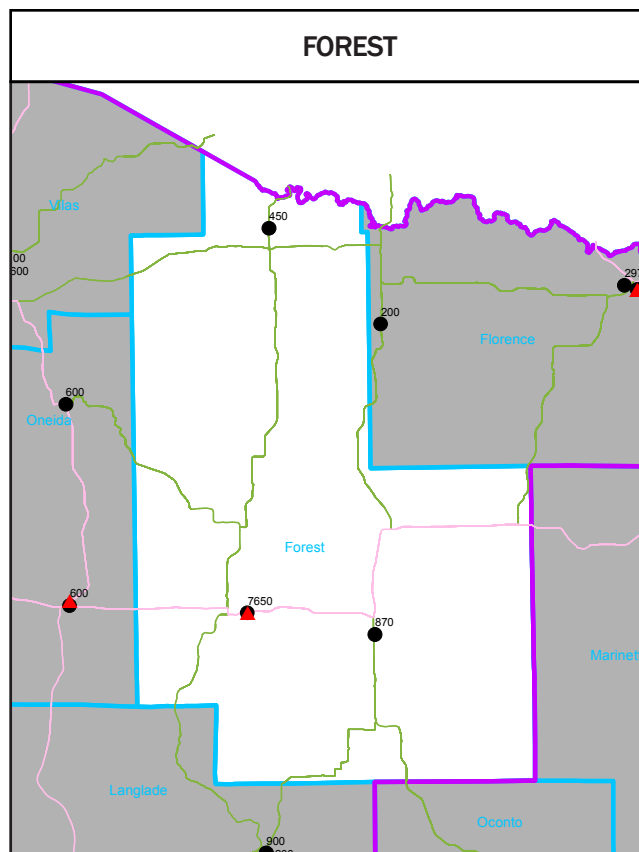
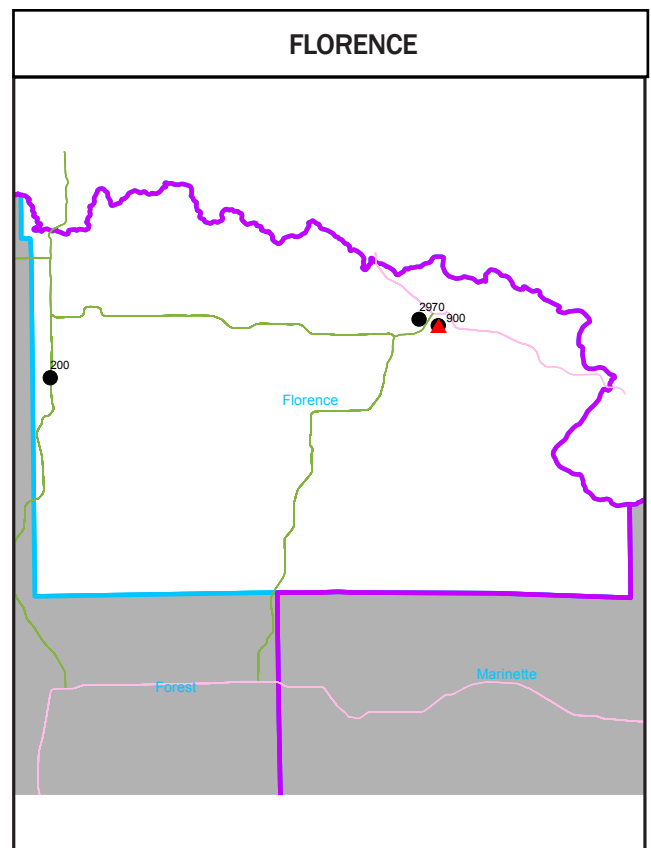
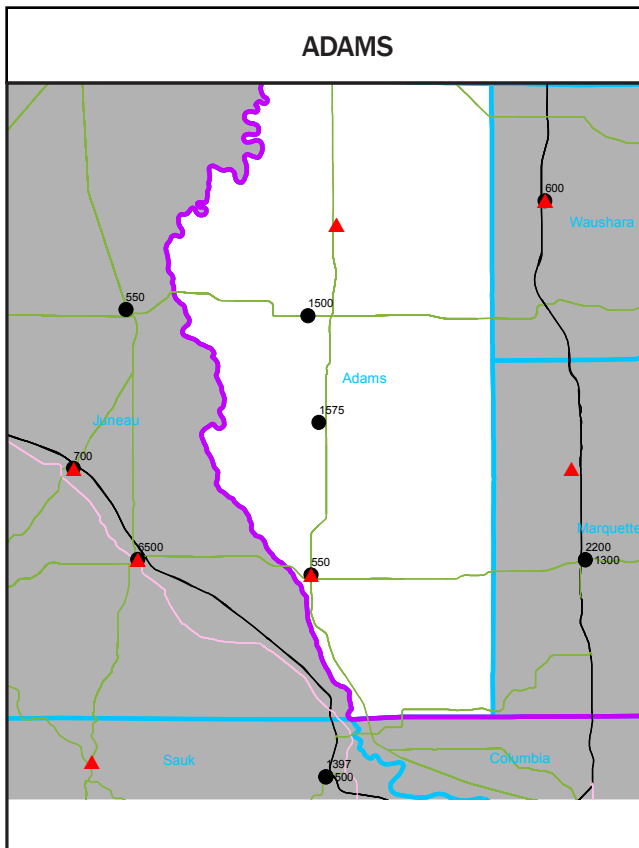


Appendix

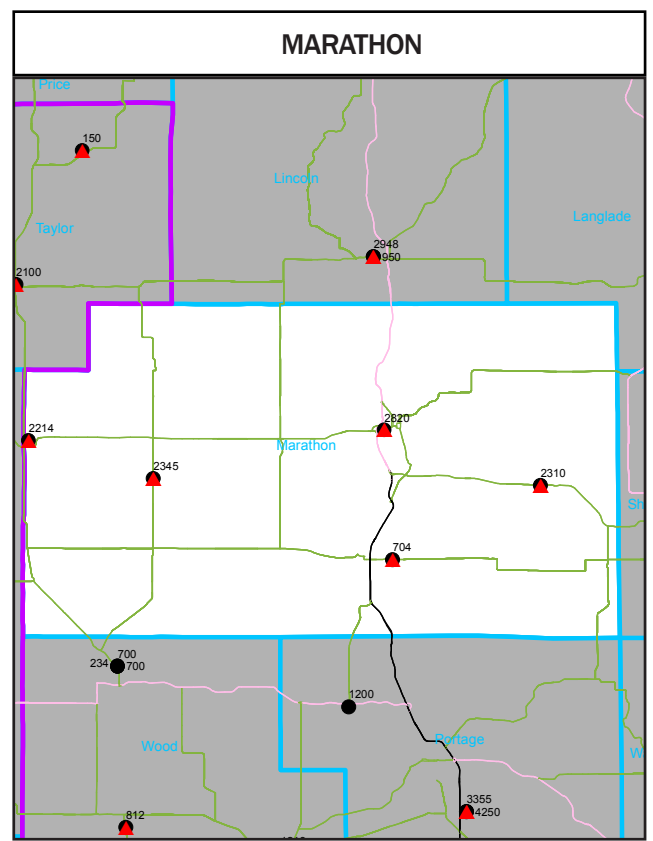
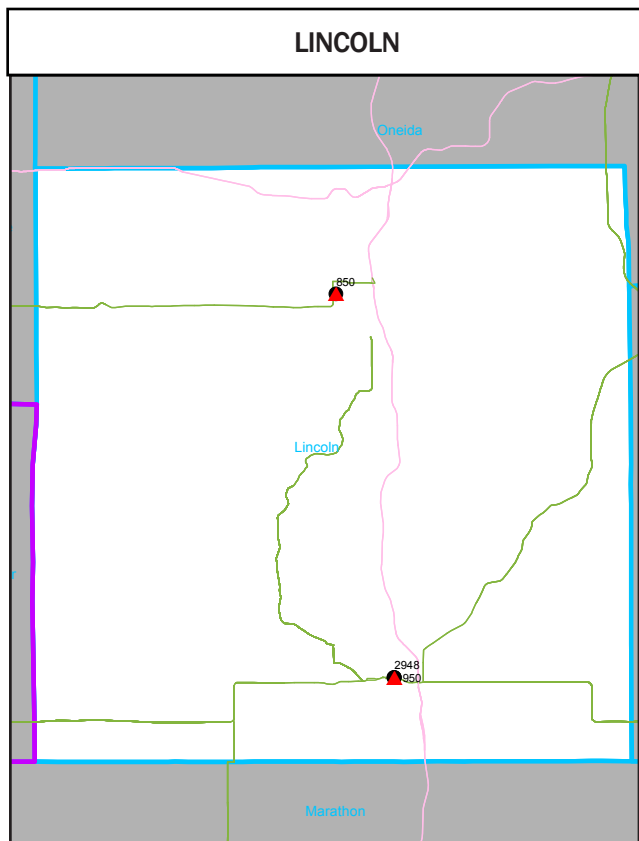
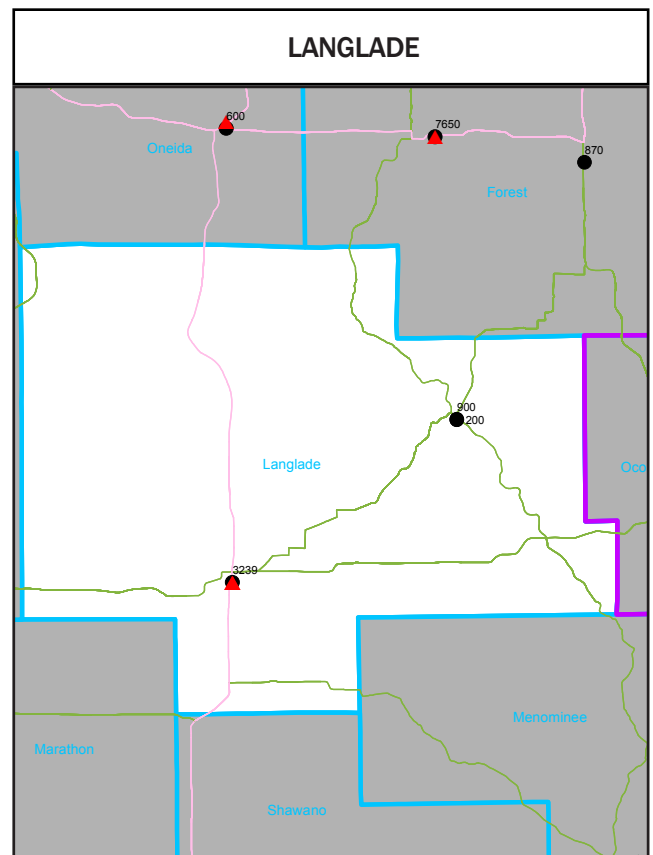
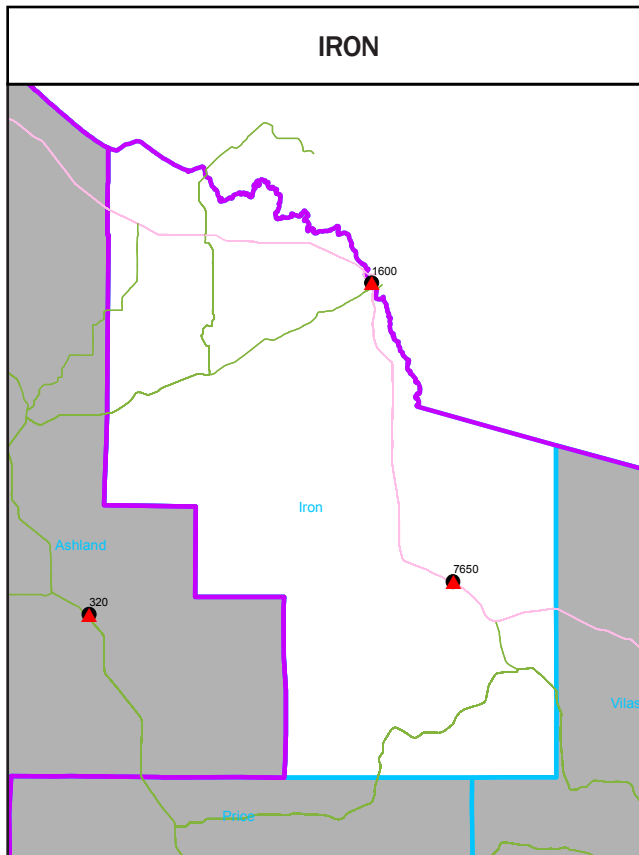
Maps of salt shed locations, organized by region	26
North Central Region	27
Northeast Region	33
Northwest Region.....	37
Southeast Region.....	43
Southwest Region	46

North Central Region Salt Sheds

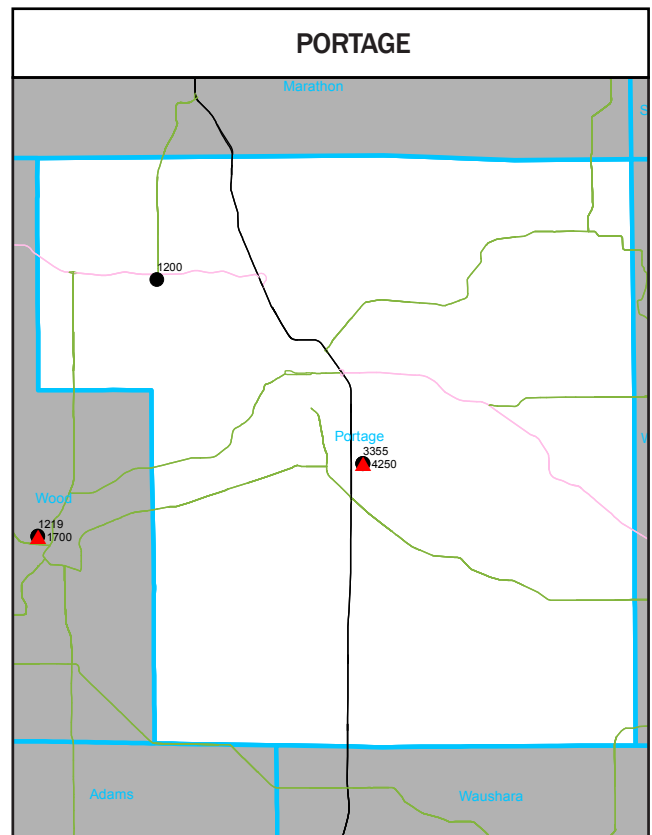
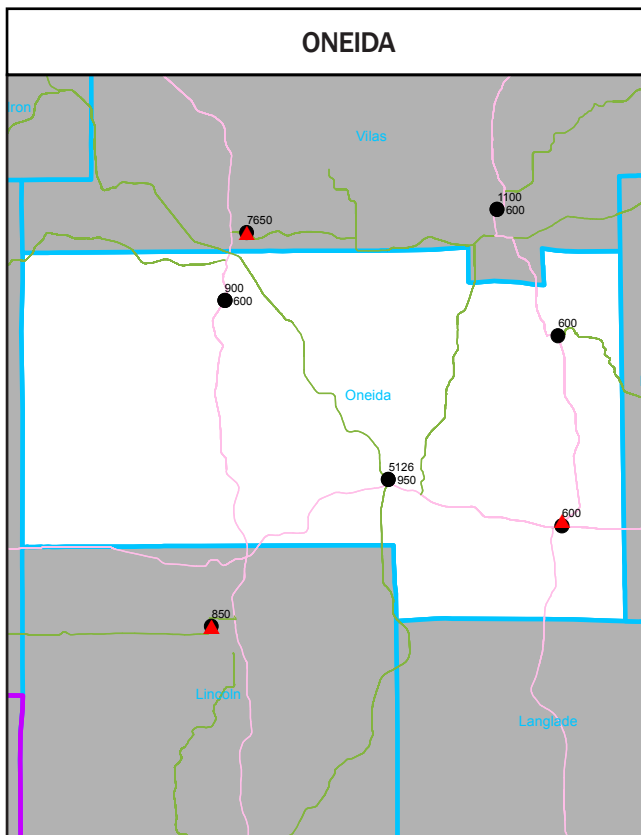
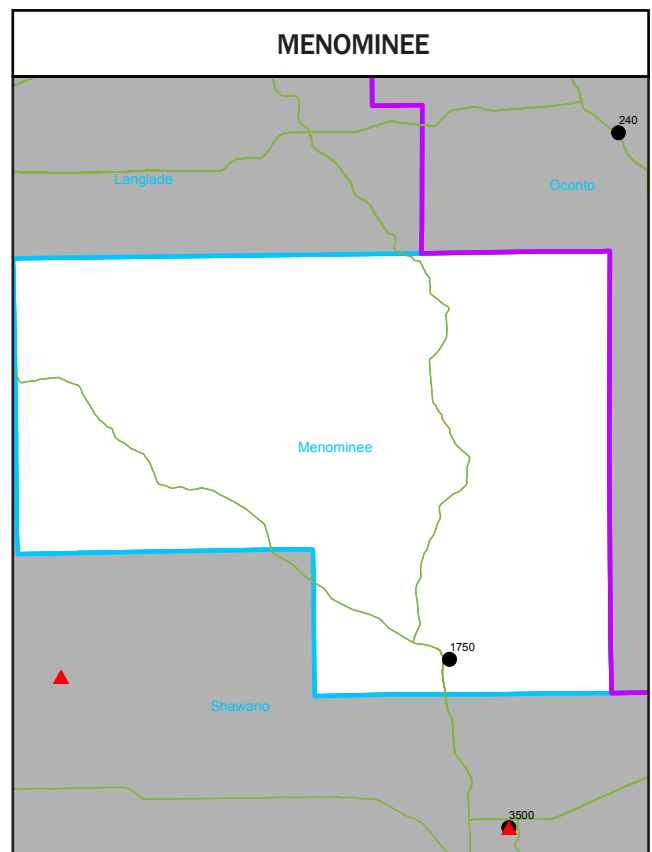
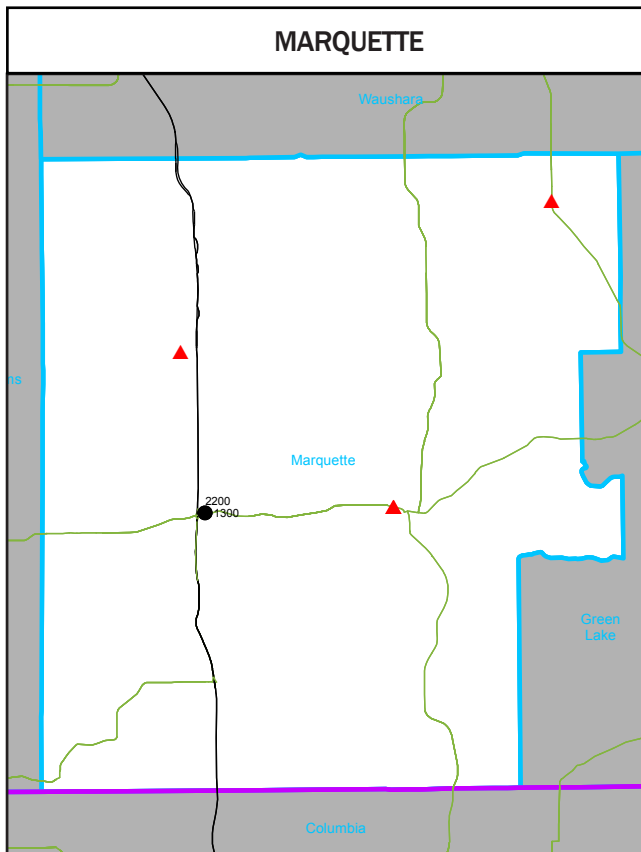




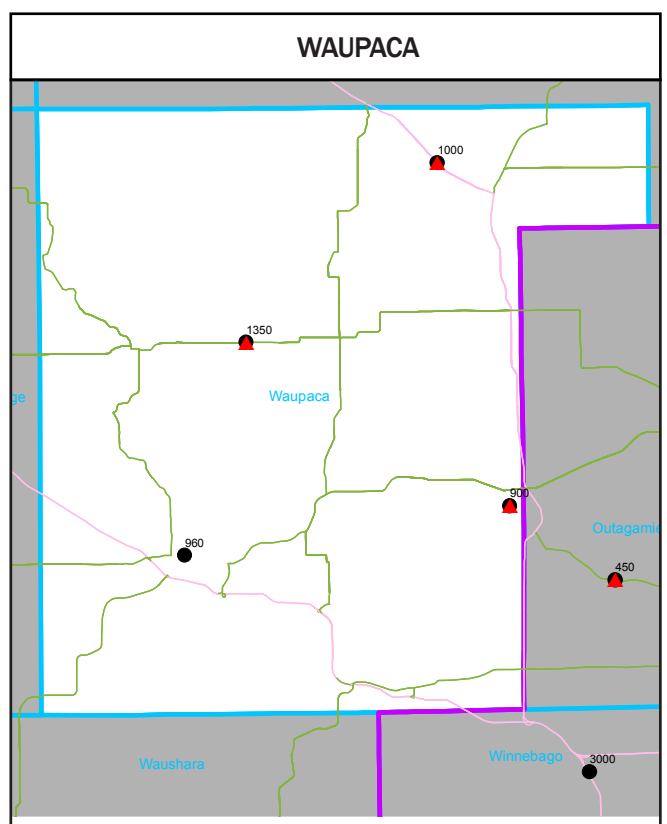
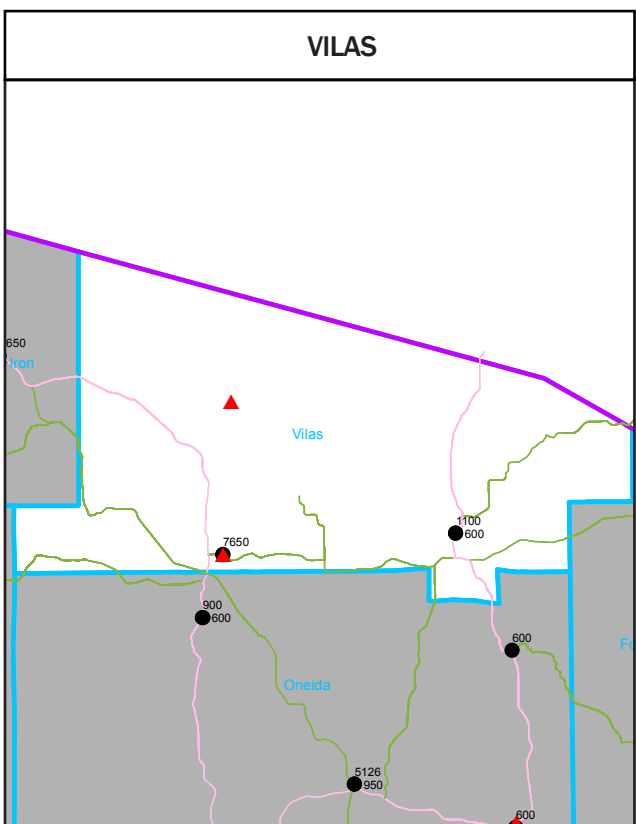
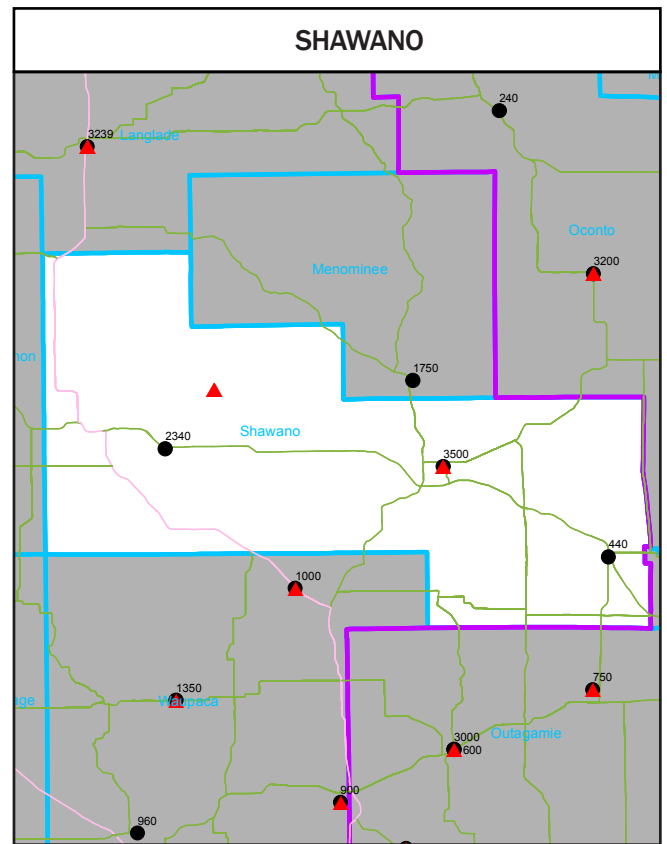
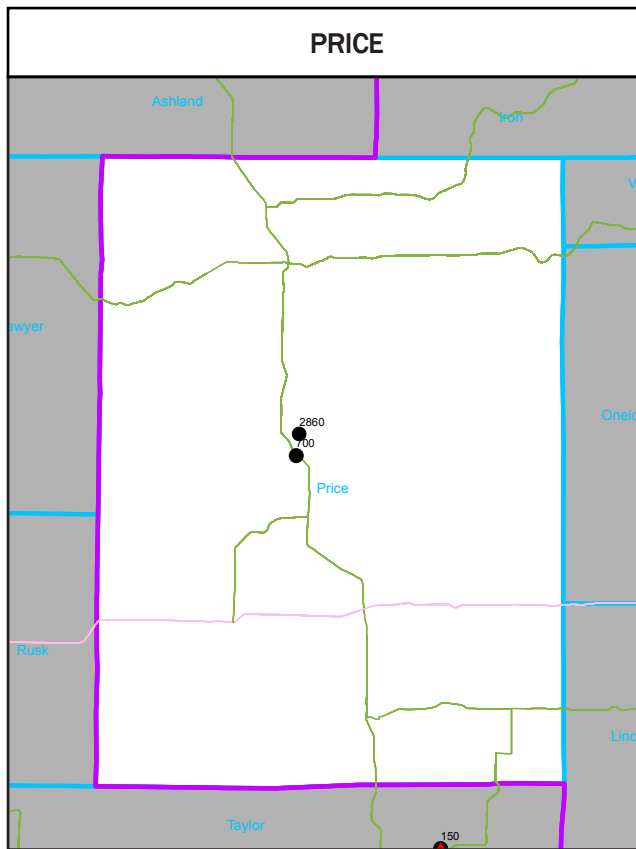
Numbered labels indicate the shed capacity allotted to WisDOT, in tons.



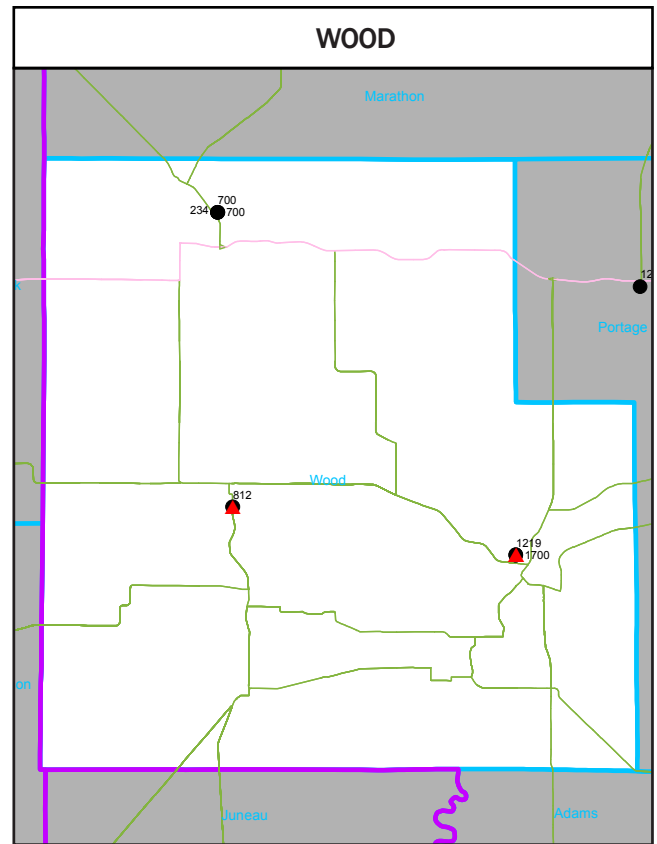
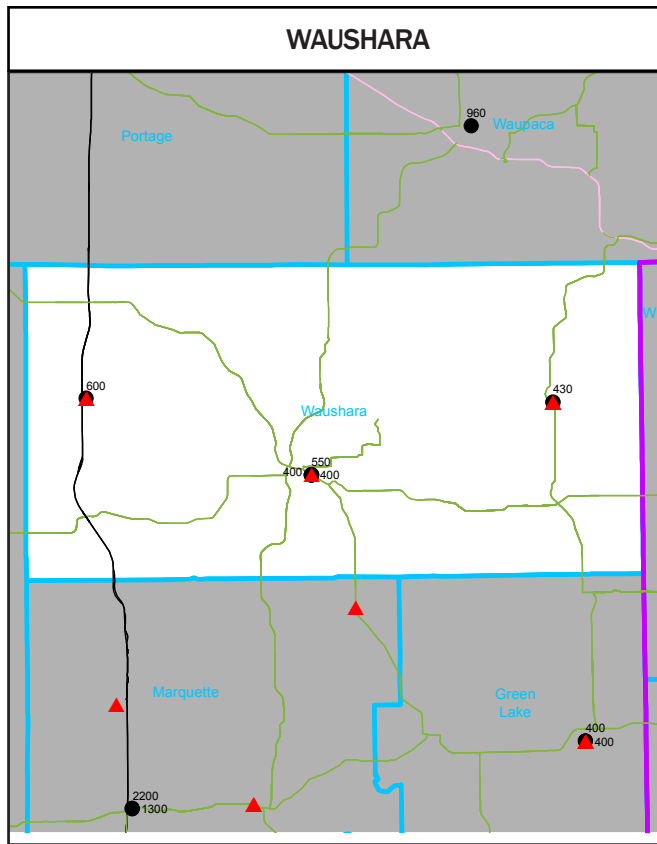
Numbered labels indicate the shed capacity allotted to WisDOT, in tons.



Numbered labels indicate the shed capacity allotted to WisDOT, in tons.



Numbered labels indicate the shed capacity allotted to WisDOT, in tons.

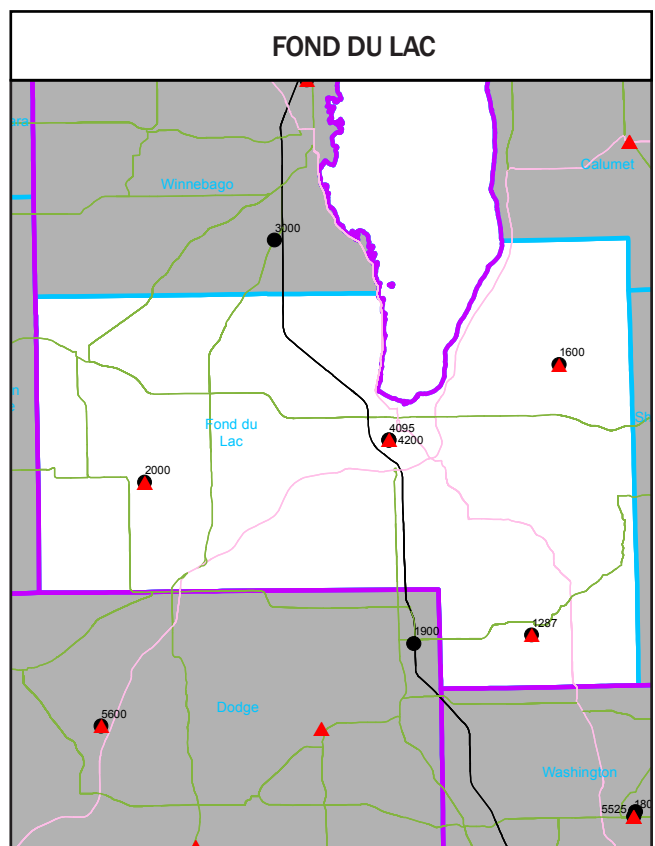
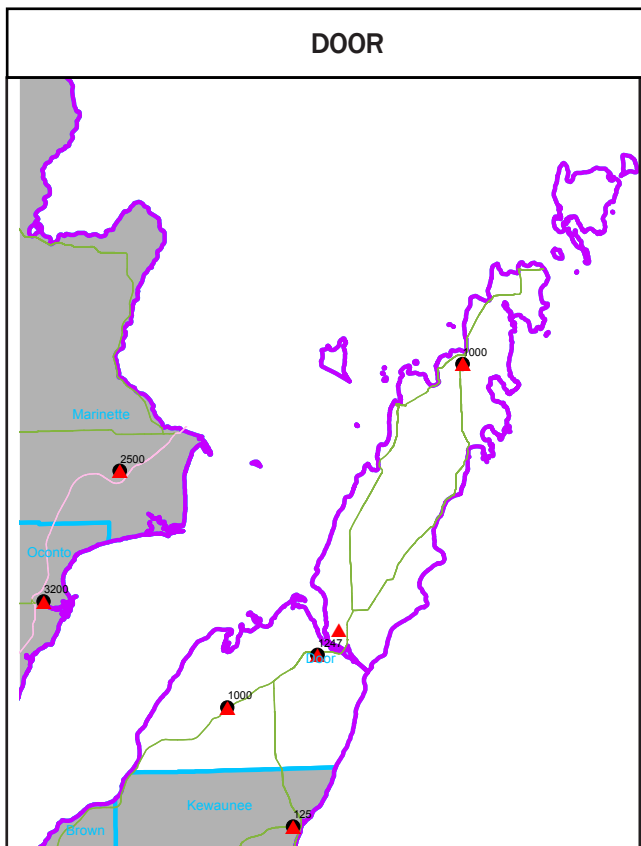
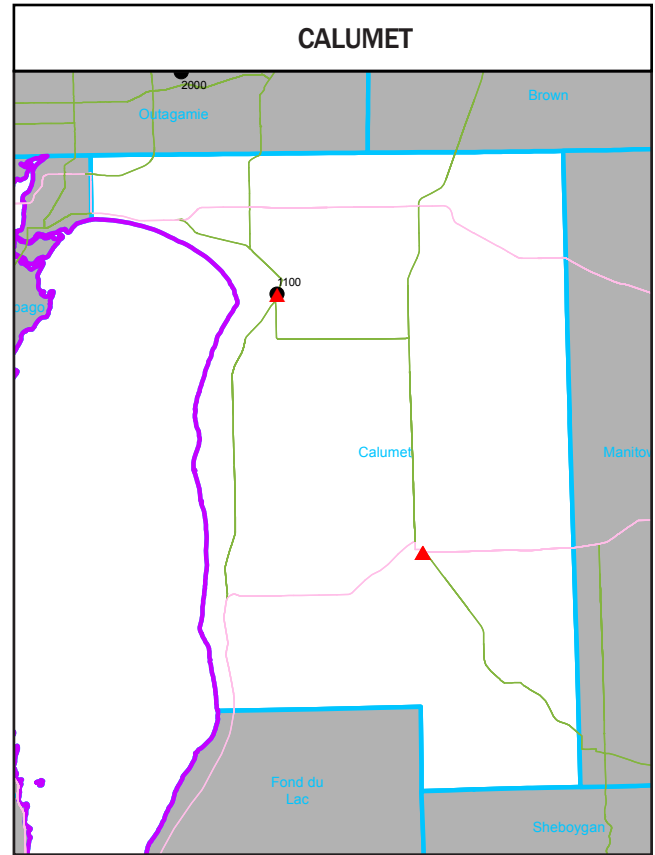
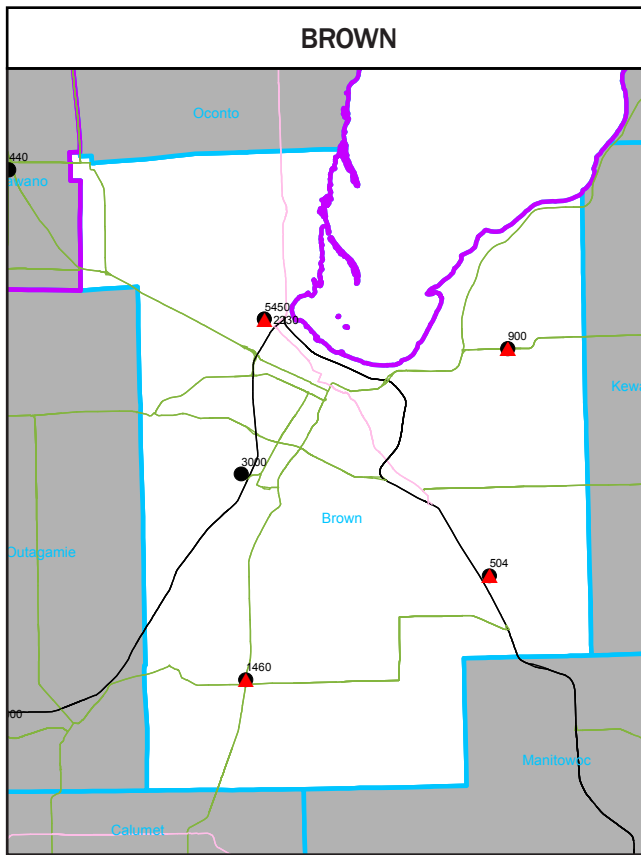


Numbered labels indicate the shed capacity allotted to WisDOT, in tons.

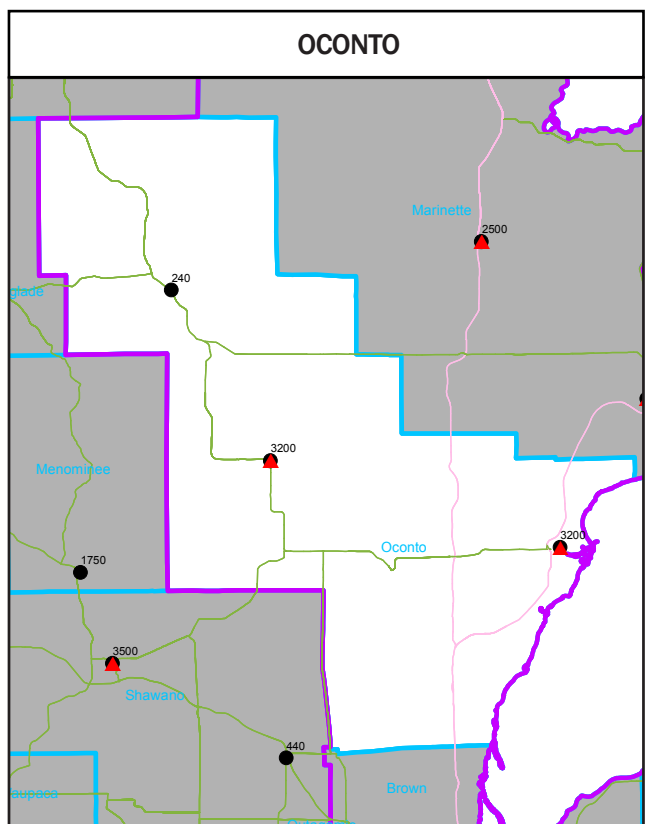
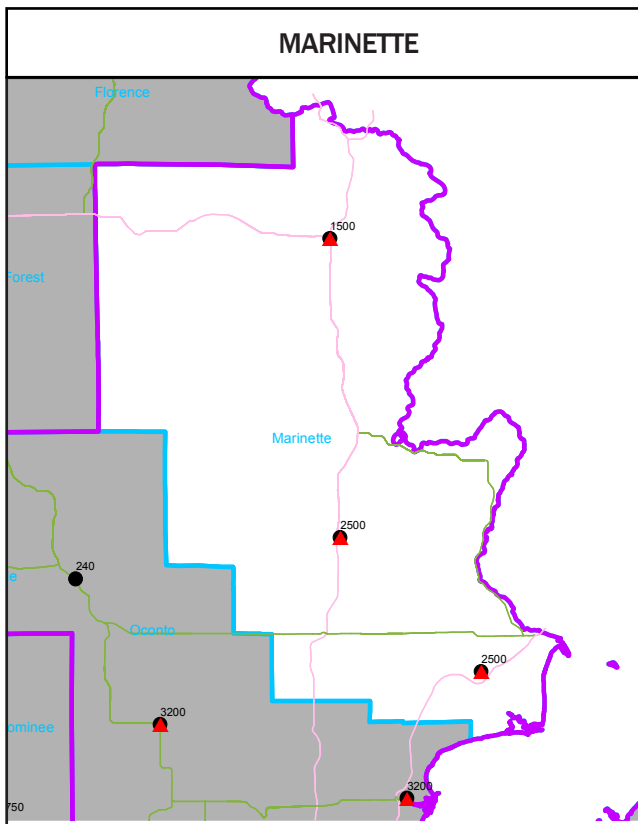
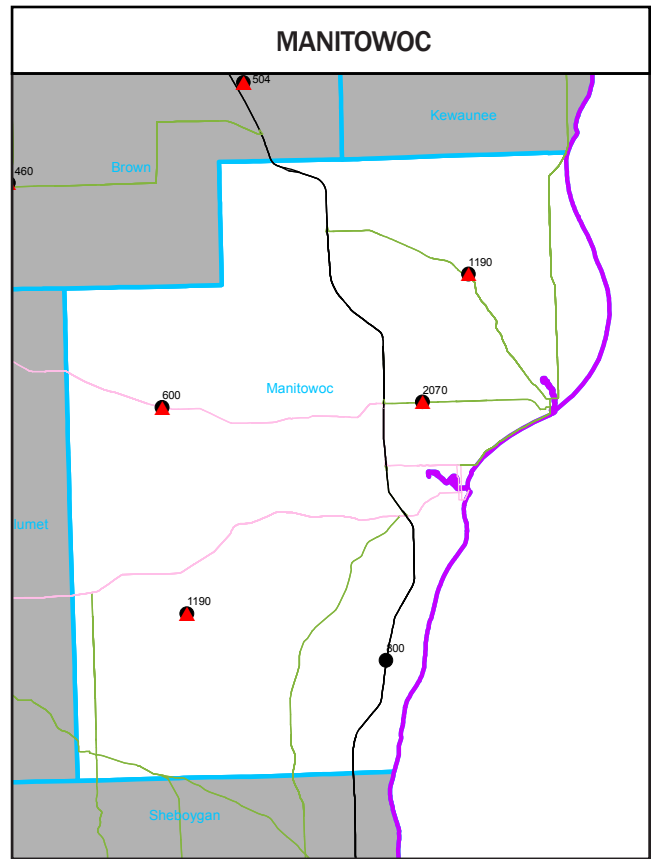
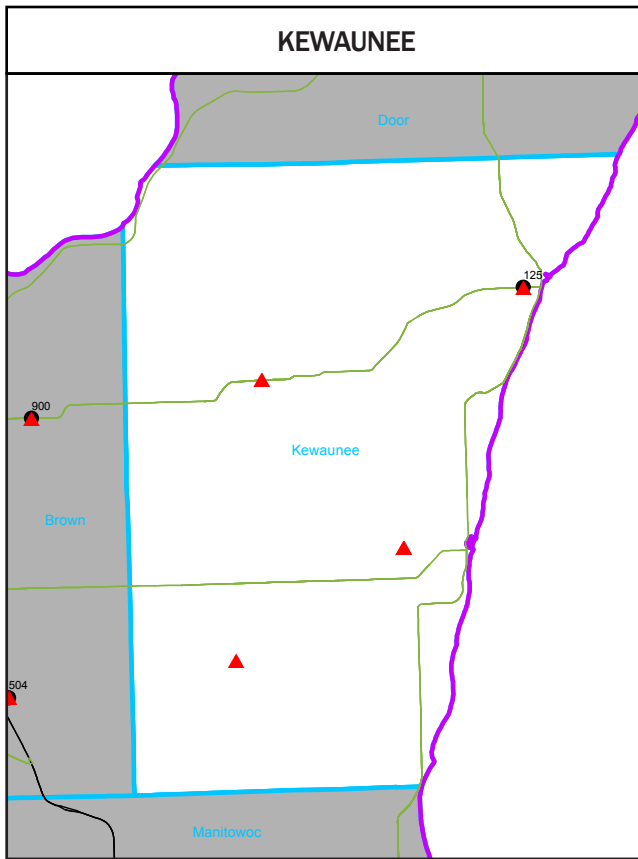
● State-financed facility

▲ County-owned facility

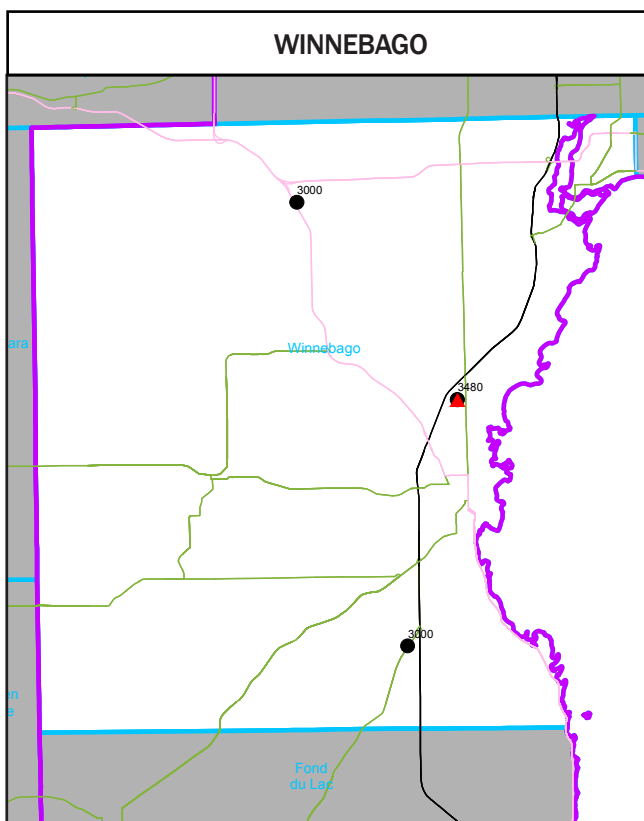
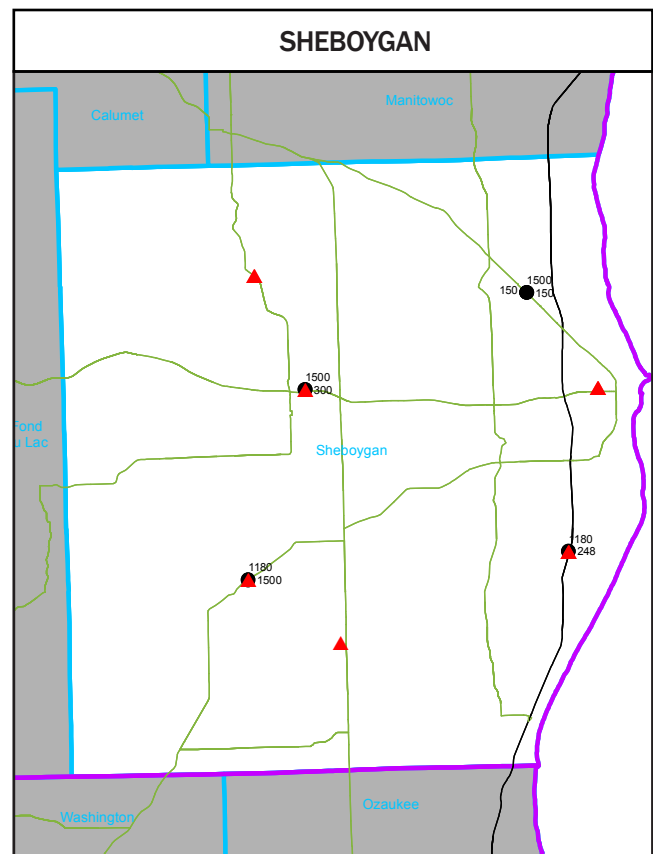
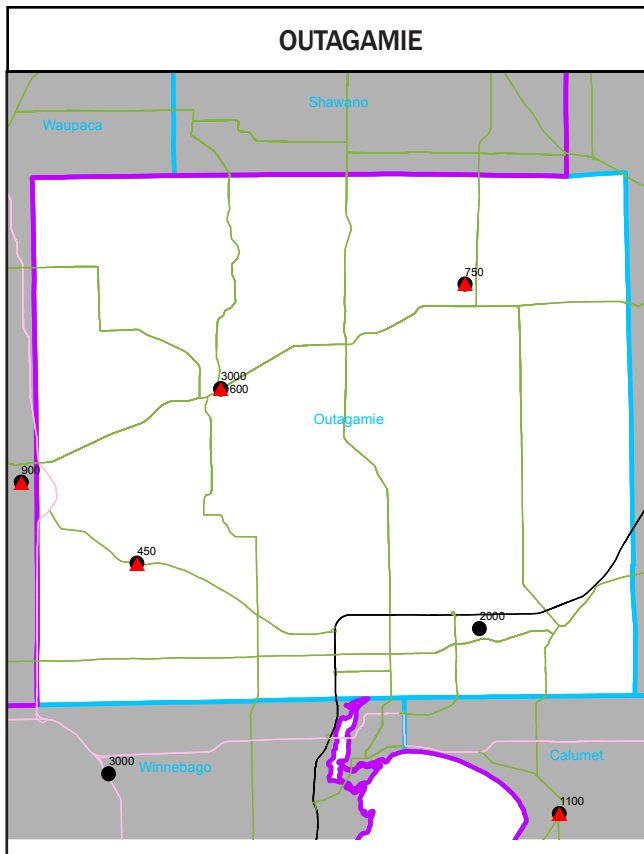
34



Numbered labels indicate the shed capacity allotted to WisDOT, in tons.

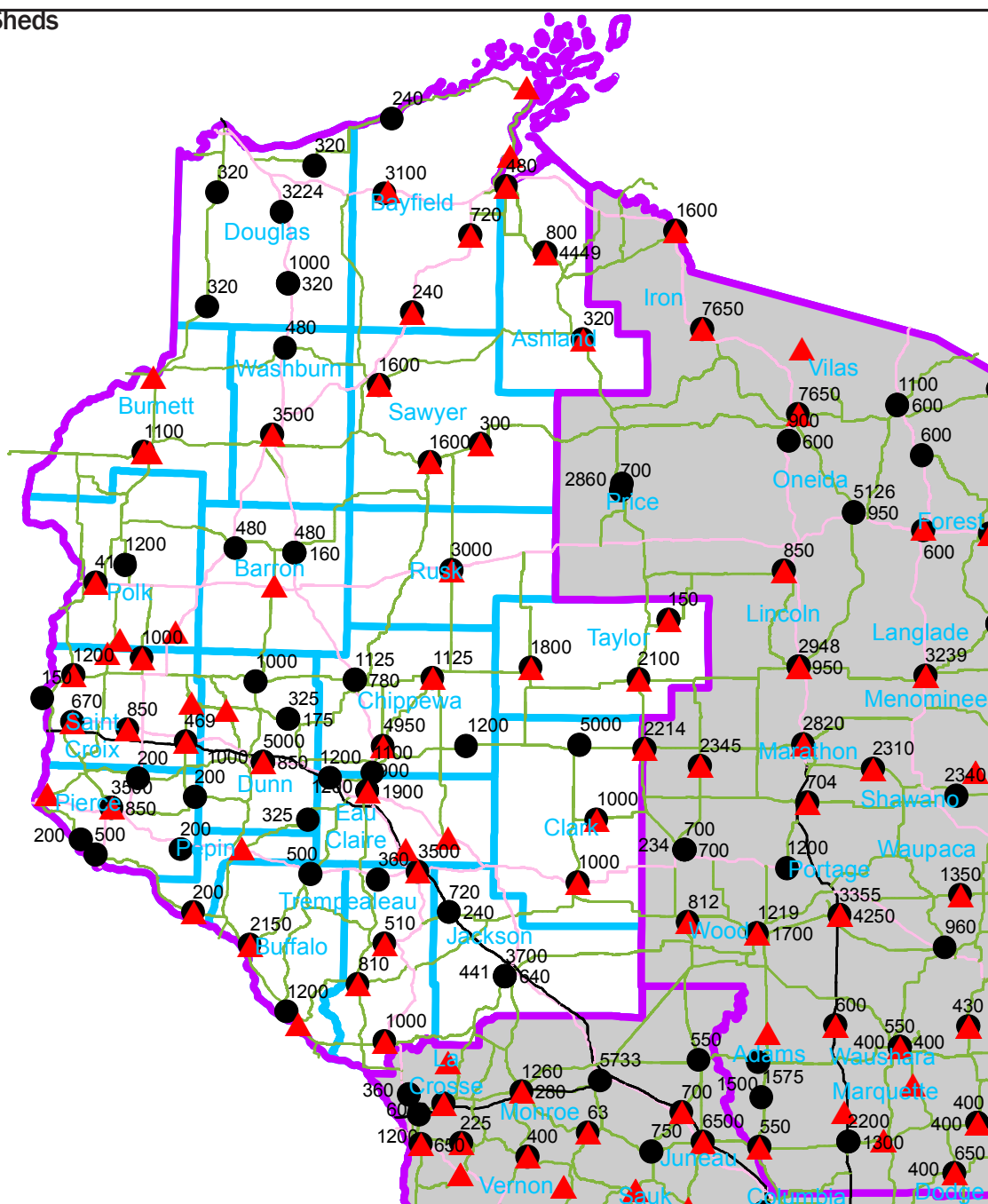


Numbered labels indicate the shed capacity allotted to WisDOT, in tons.



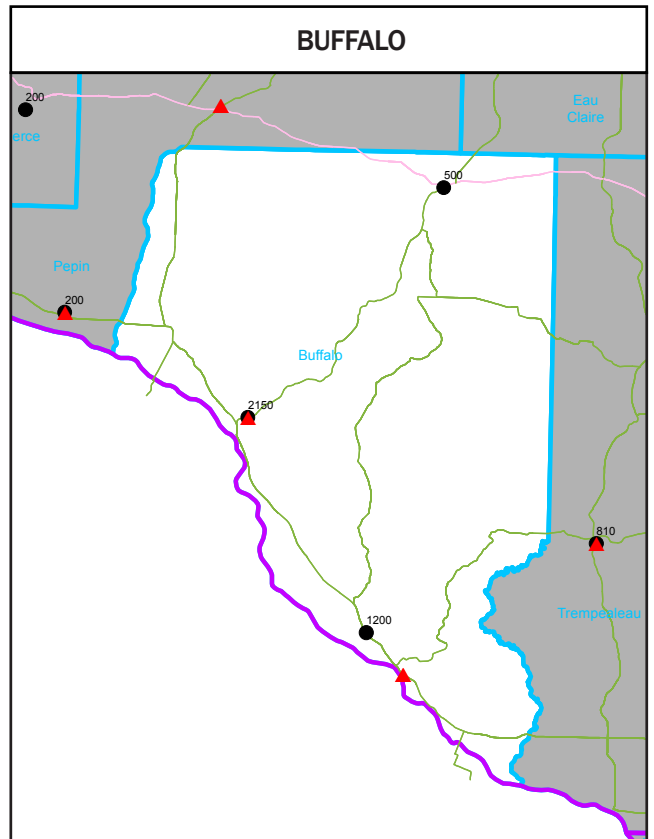
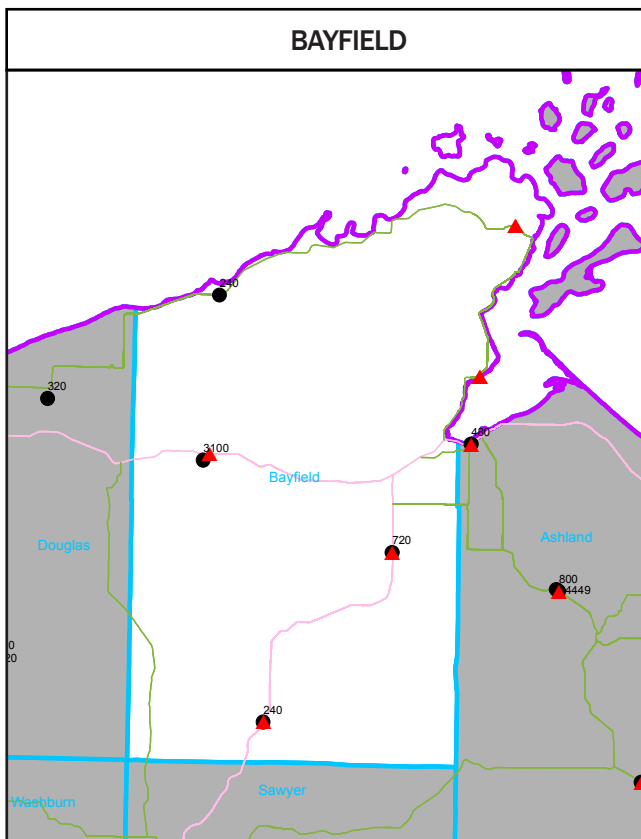
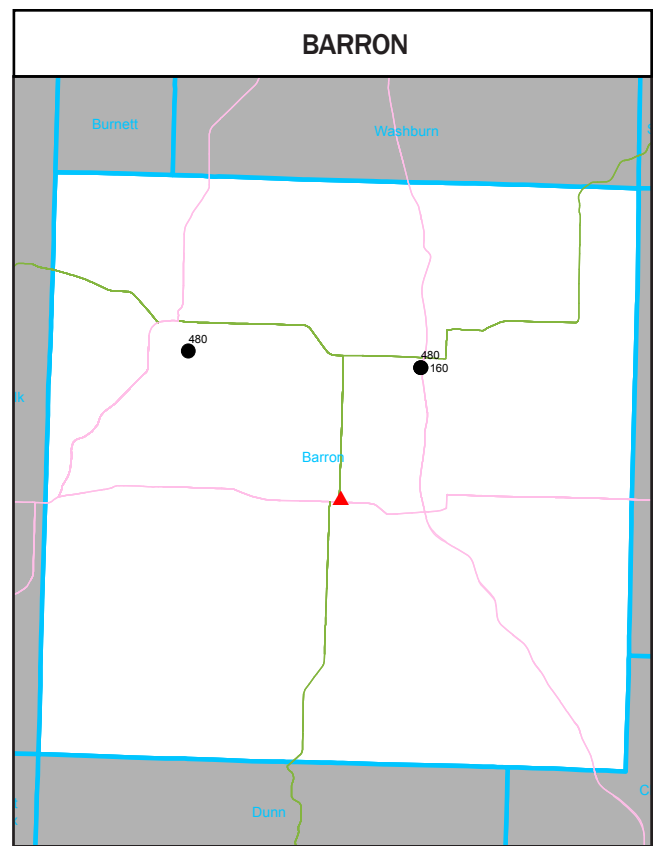
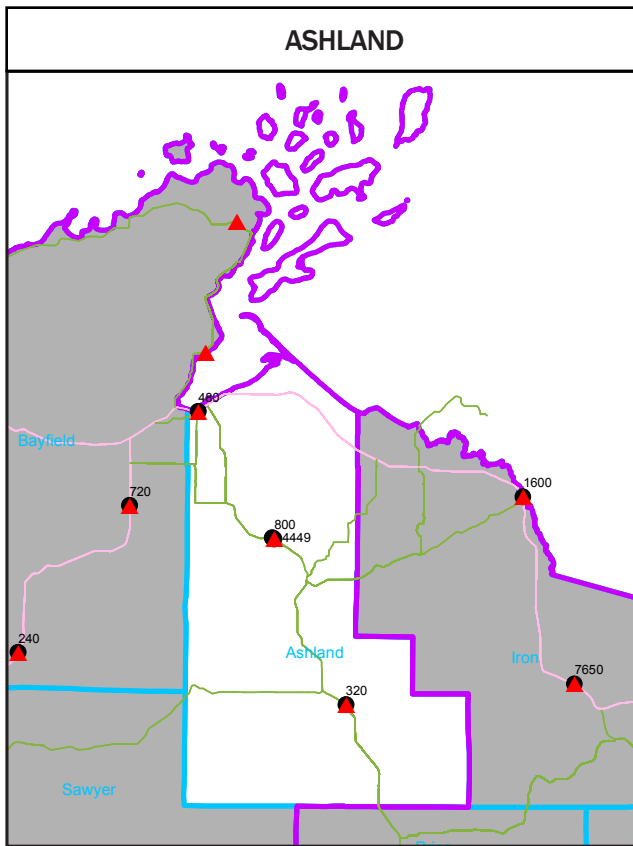
Numbered labels indicate the shed capacity allotted to WisDOT, in tons.

Northwest Region Salt Sheds

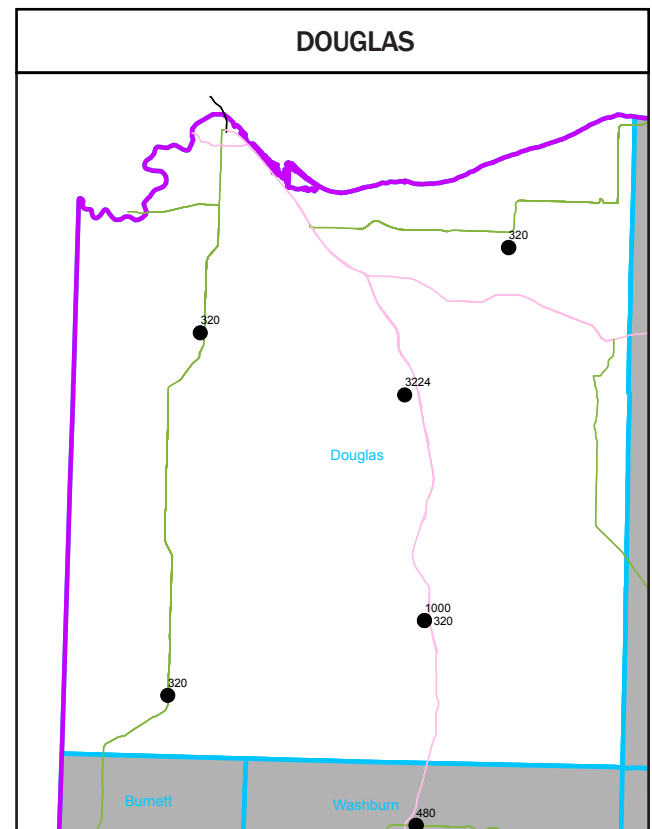
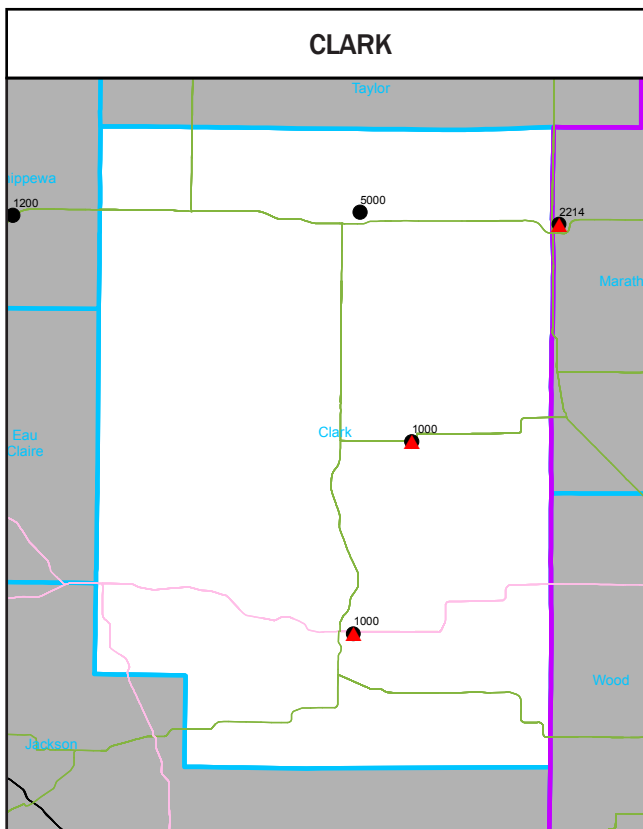
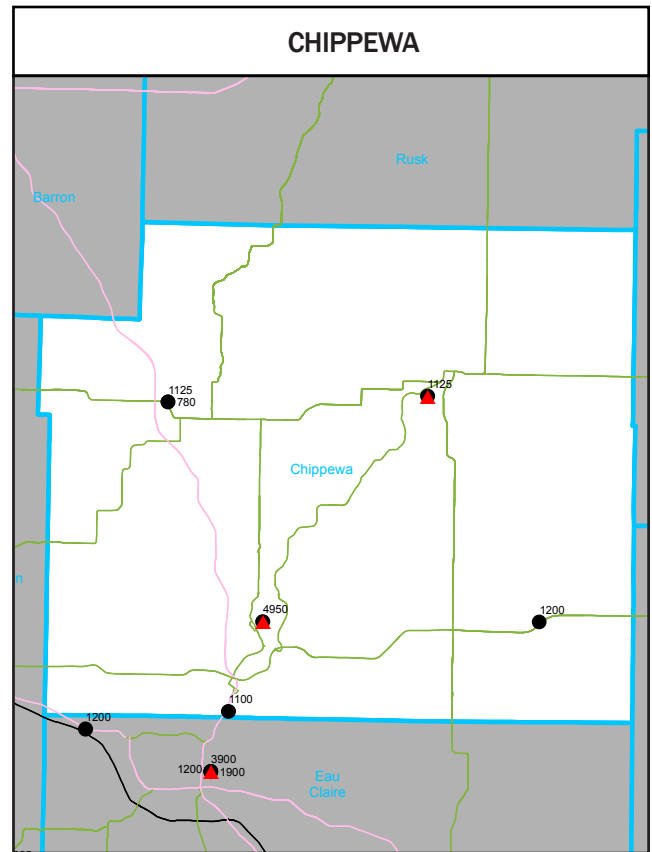
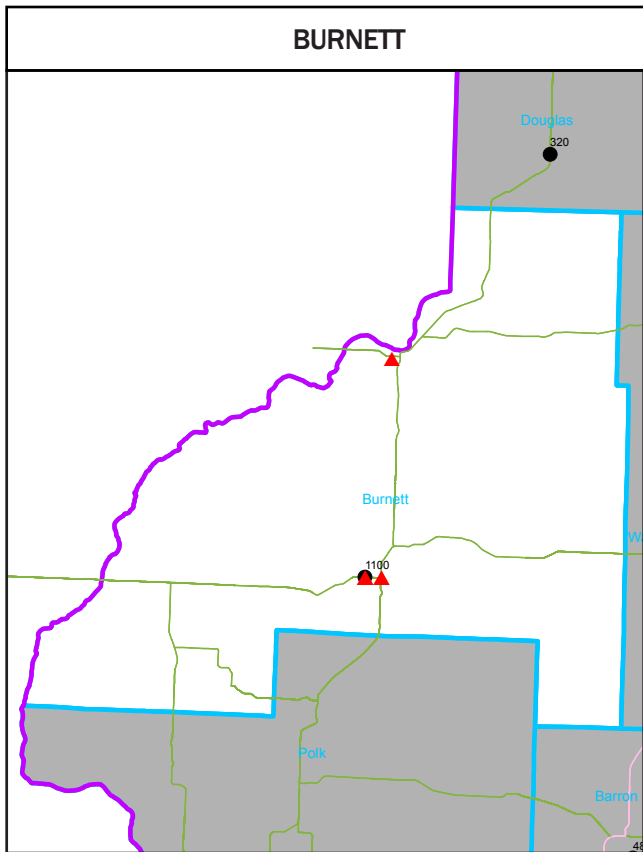


- State-financed facility
- ▲ County-owned facility

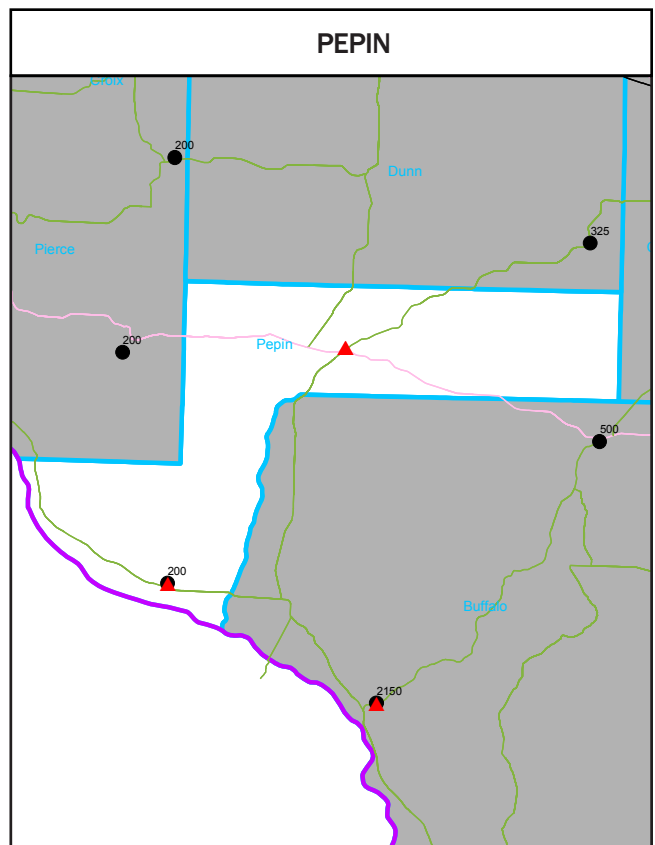
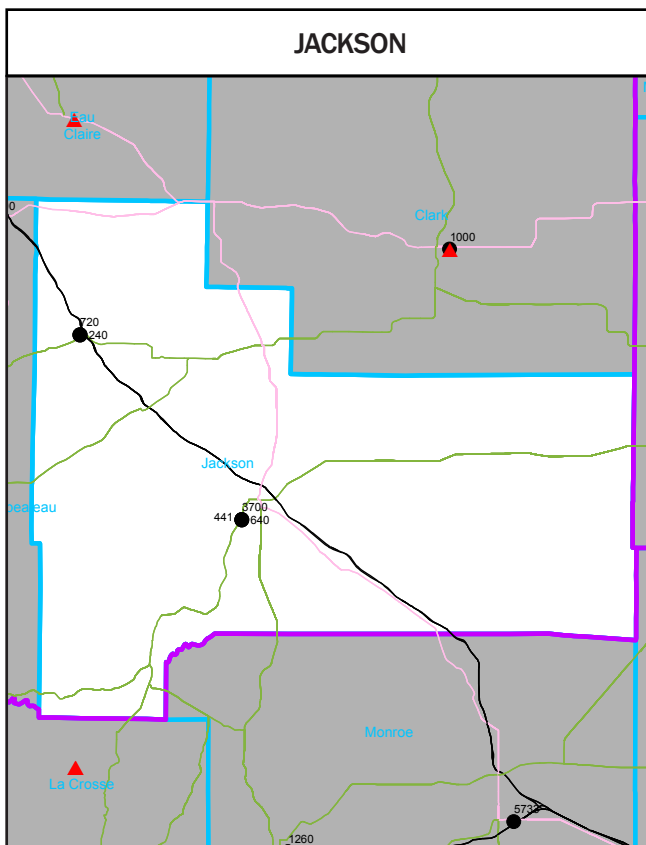
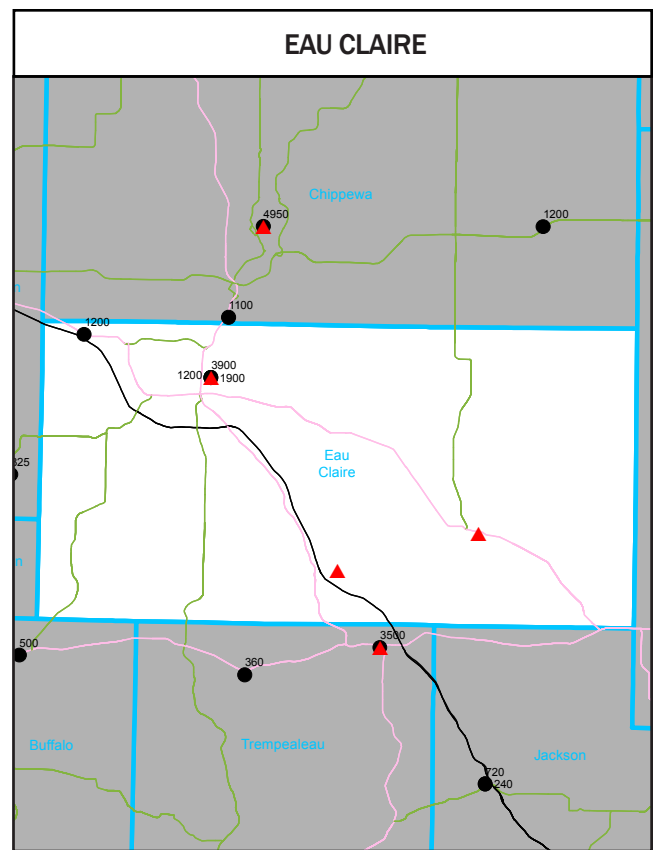
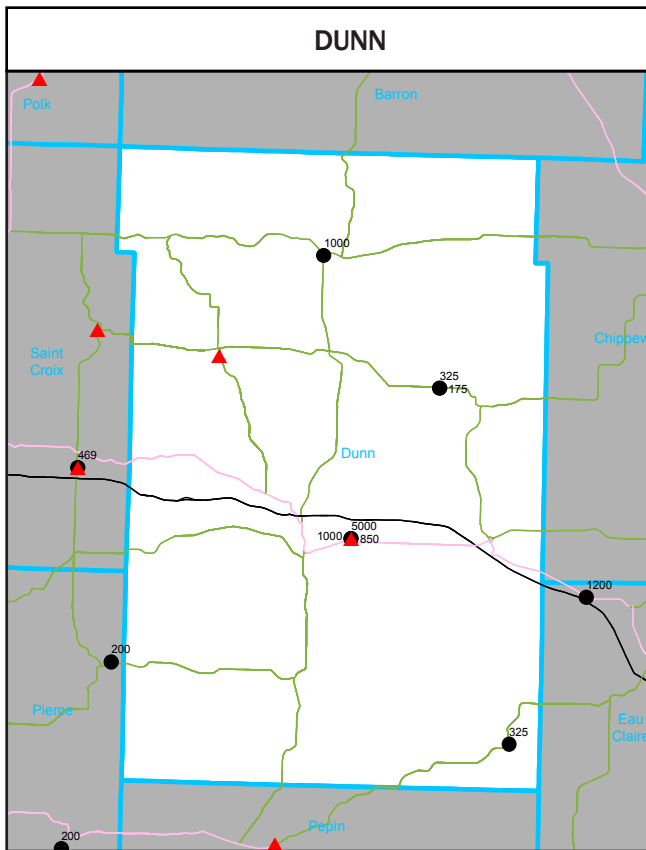
Numbered labels indicate the shed capacity allotted to WisDOT, in tons.



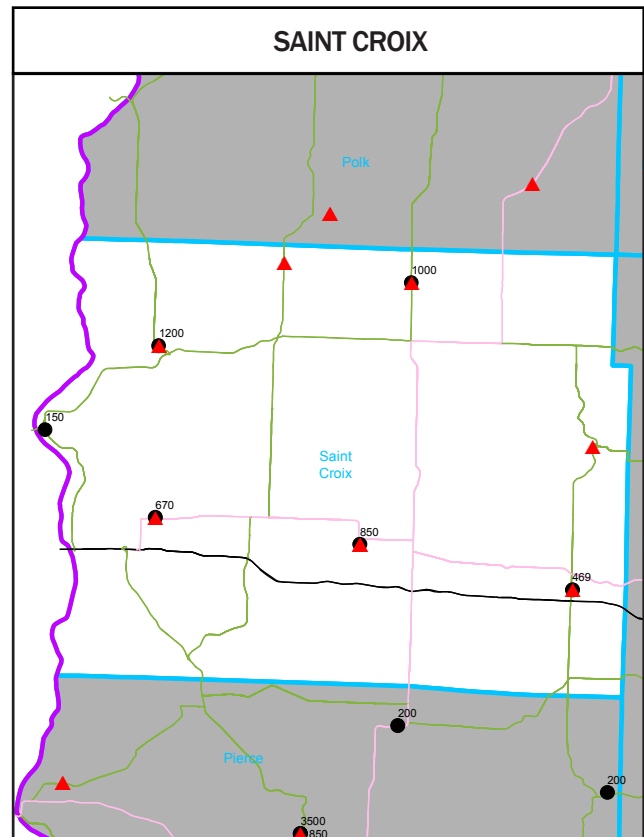
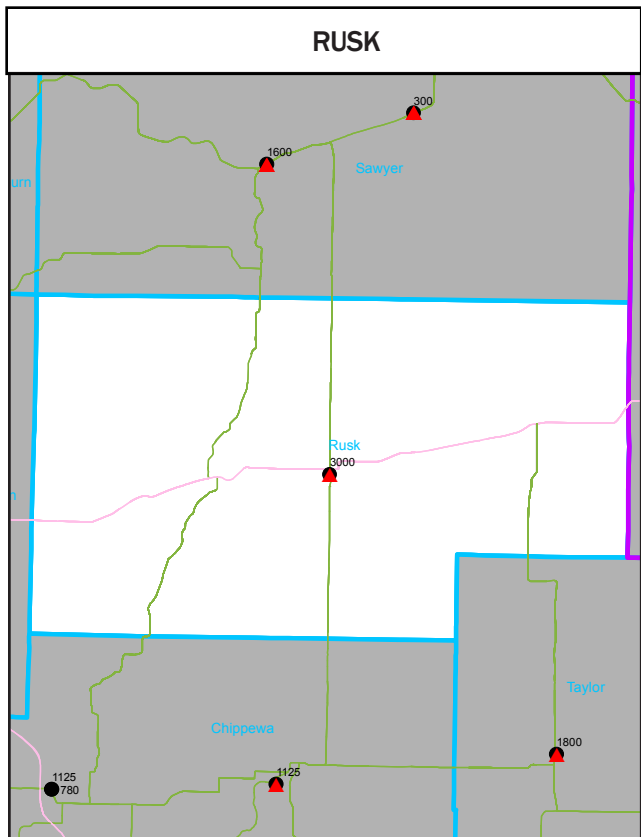
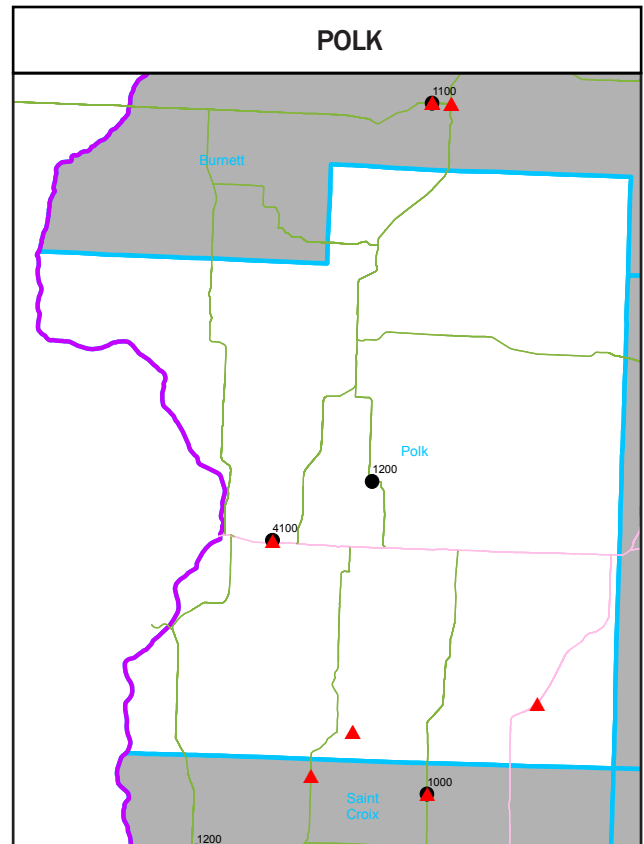
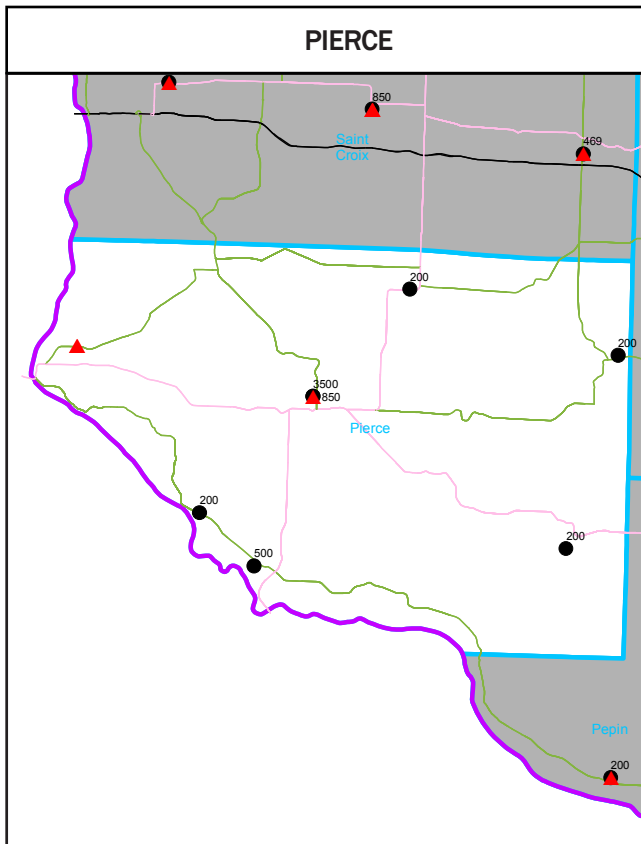
Numbered labels indicate the shed capacity allotted to WisDOT, in tons.



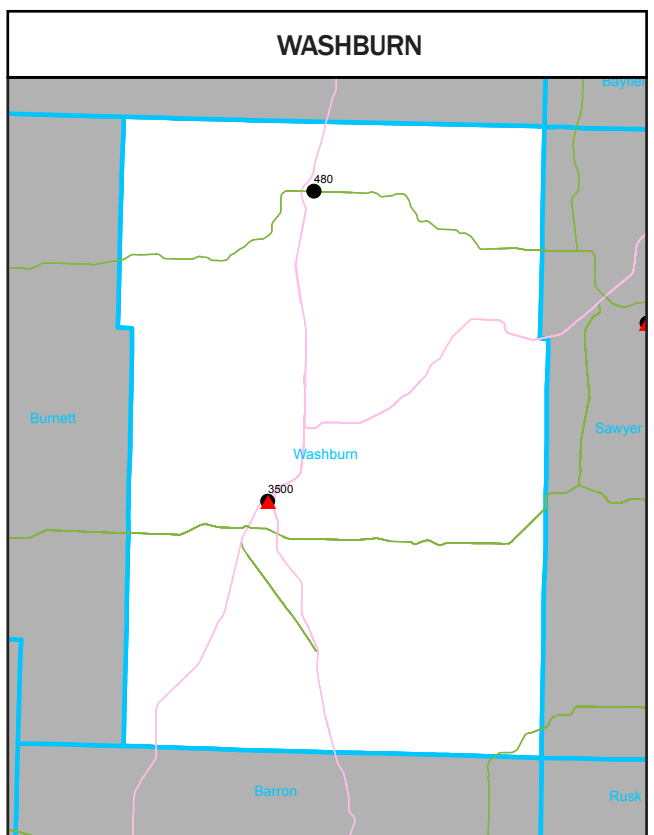
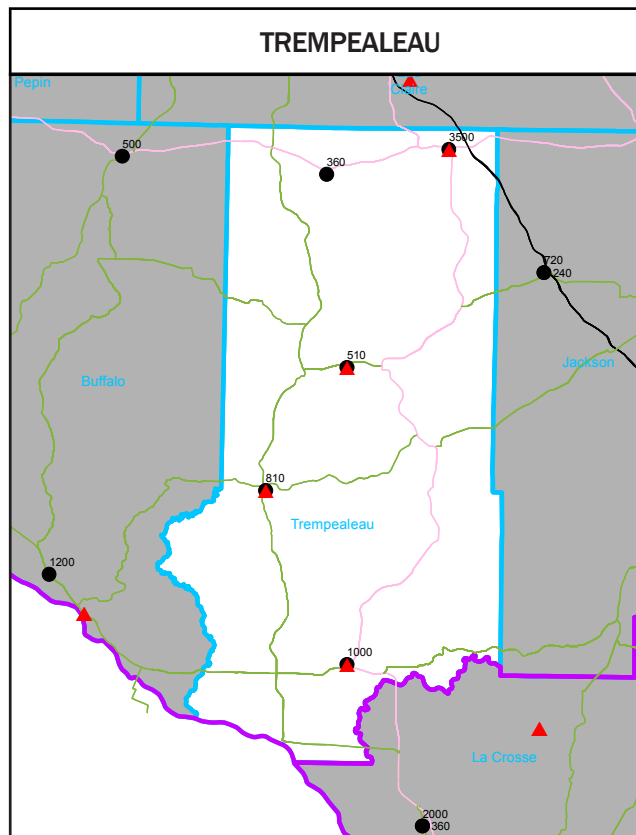
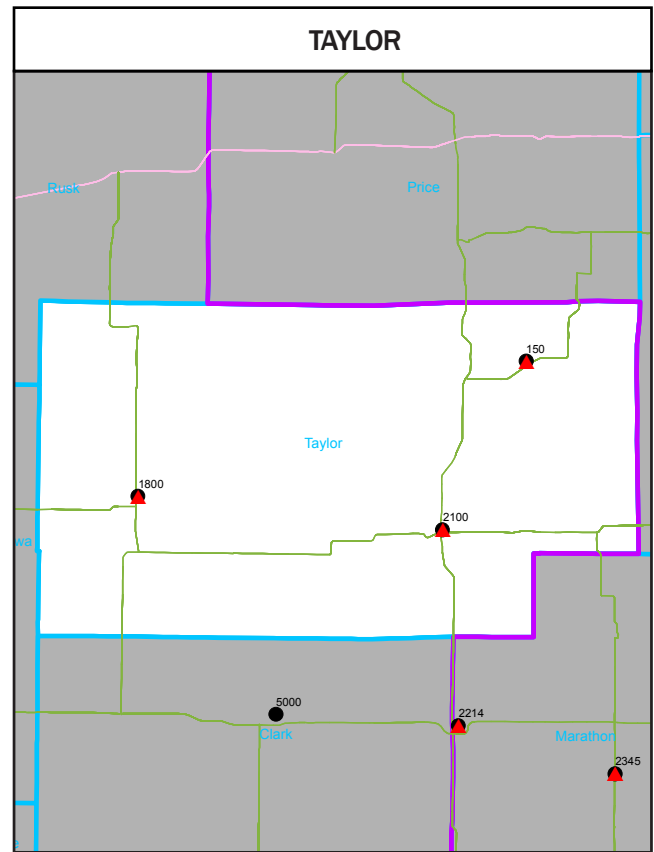
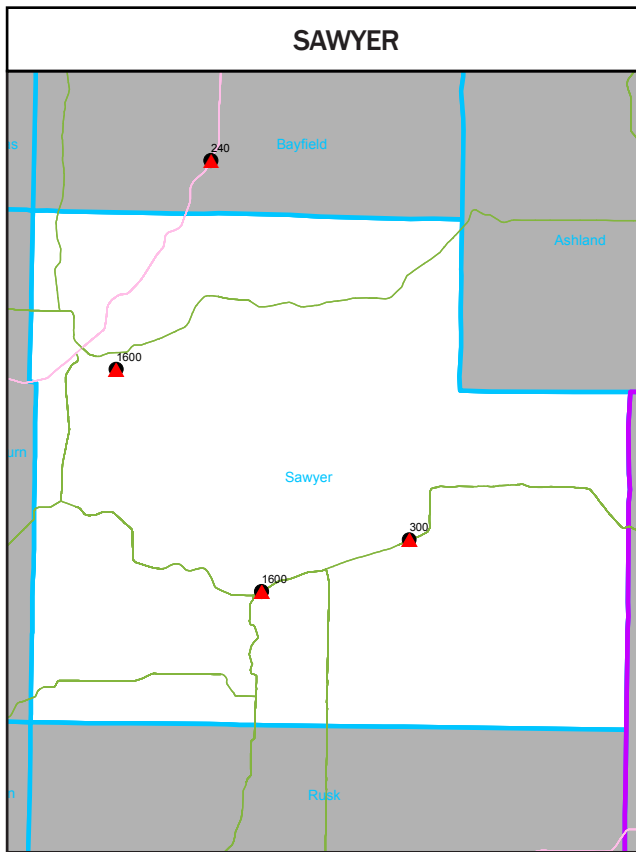
Numbered labels indicate the shed capacity allotted to WisDOT, in tons.



Numbered labels indicate the shed capacity allotted to WisDOT, in tons.



Numbered labels indicate the shed capacity allotted to WisDOT, in tons.

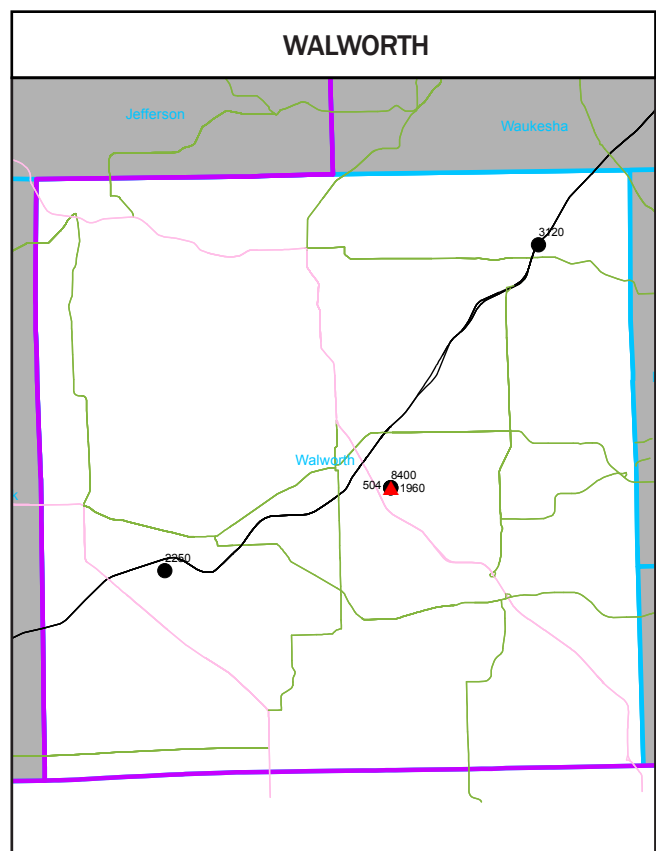
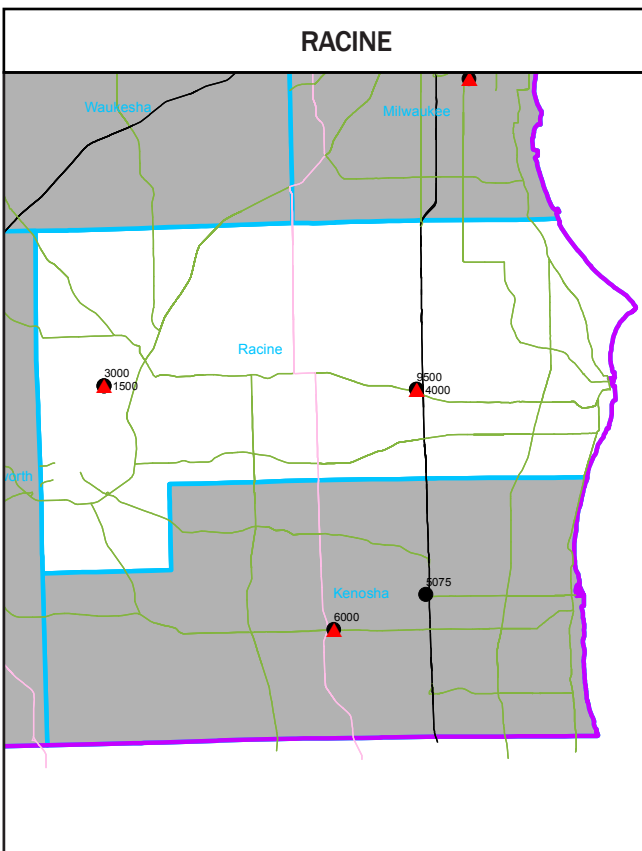
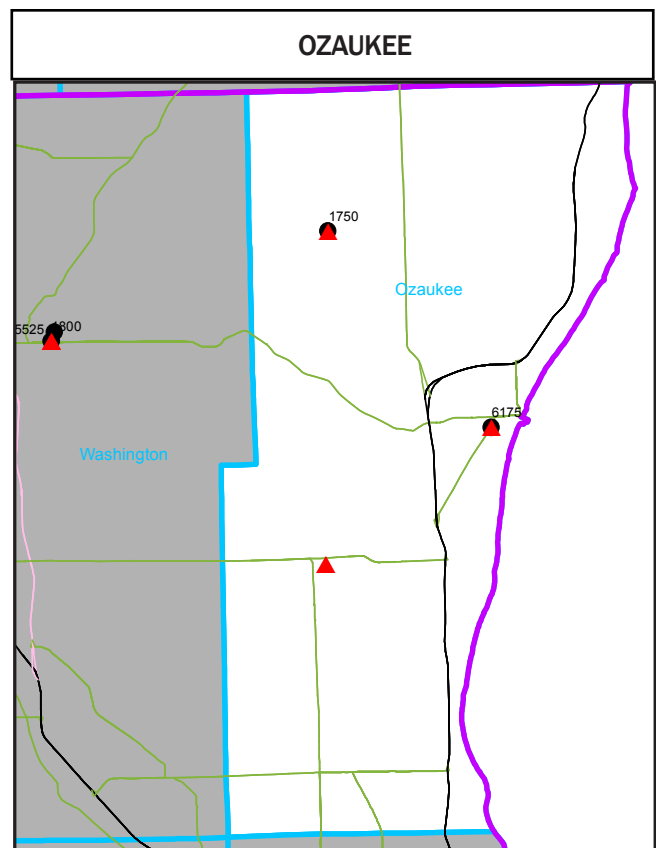
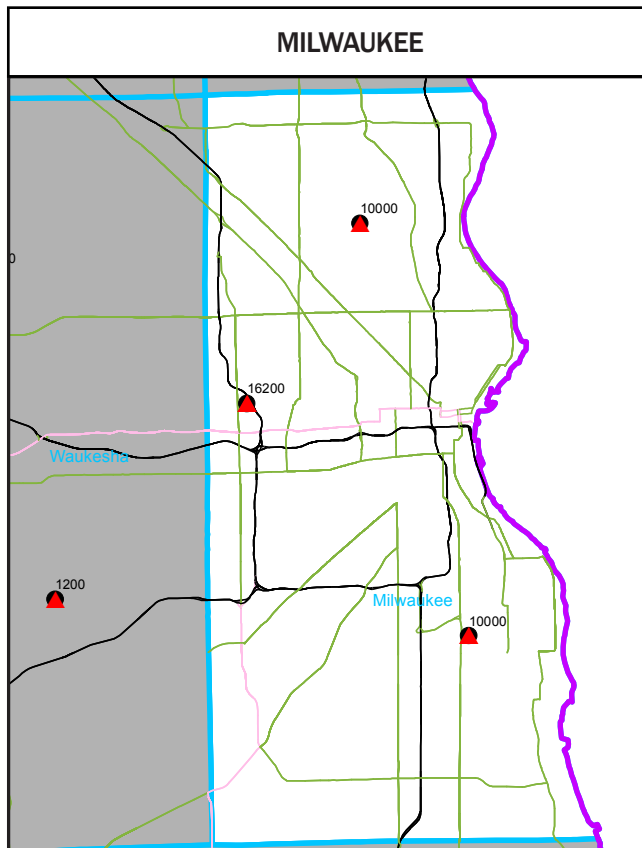


Numbered labels indicate the shed capacity allotted to WisDOT, in tons.

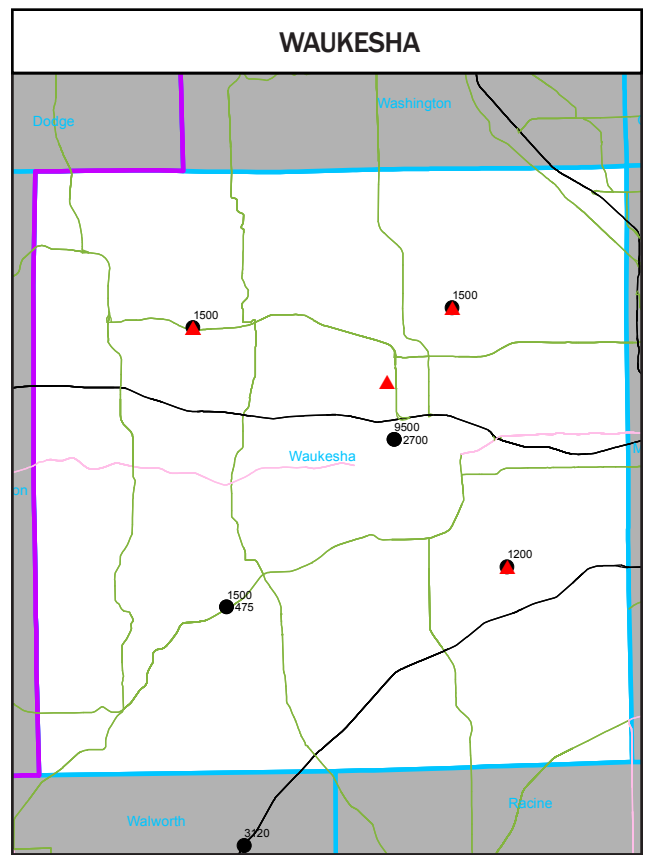
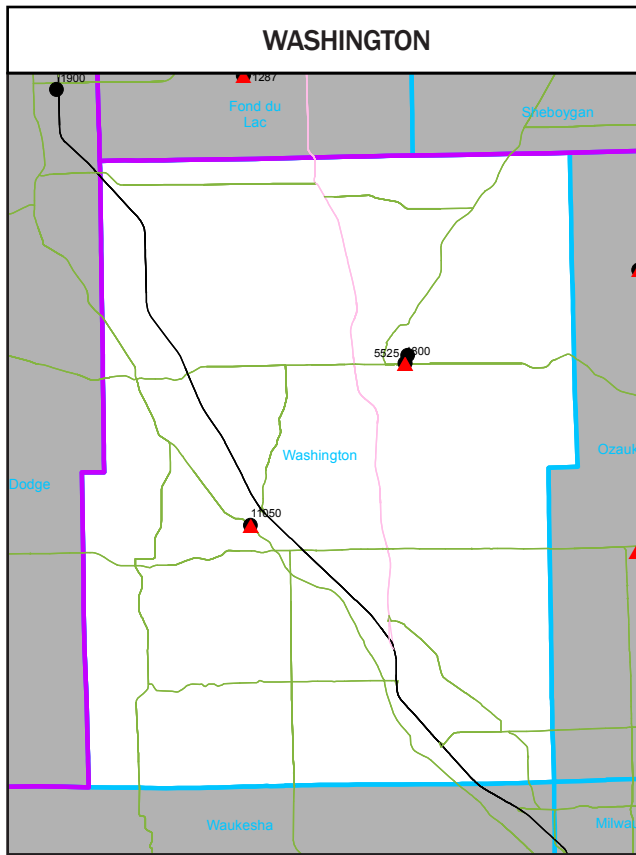
A map of Wisconsin showing county boundaries and major cities. The map is divided into counties by colored lines: purple for the northern and western borders, blue for the eastern border, and green for the southern border. Major cities are marked with black dots and labeled in blue text. Elevation data points are shown as red triangles with numerical values. The map includes labels for several counties: Green Lake, Columbia, Dodge, Washington, Ozaukee, Dane, Jefferson, Waukesha, Milwaukee, Racine, Walworth, and Kenosha. Major cities labeled include Green Lake, Columbia, Dodge, Washington, Ozaukee, Dane, Jefferson, Waukesha, Milwaukee, Racine, Walworth, and Kenosha. Elevation data points are shown as red triangles with numerical values. The map includes labels for several counties: Green Lake, Columbia, Dodge, Washington, Ozaukee, Dane, Jefferson, Waukesha, Milwaukee, Racine, Walworth, and Kenosha. Major cities labeled include Green Lake, Columbia, Dodge, Washington, Ozaukee, Dane, Jefferson, Waukesha, Milwaukee, Racine, Walworth, and Kenosha. Elevation data points are shown as red triangles with numerical values.

- State-financed facility
- ▲ County-owned facility

Numbered labels indicate the shed capacity allotted to WisDOT, in tons.

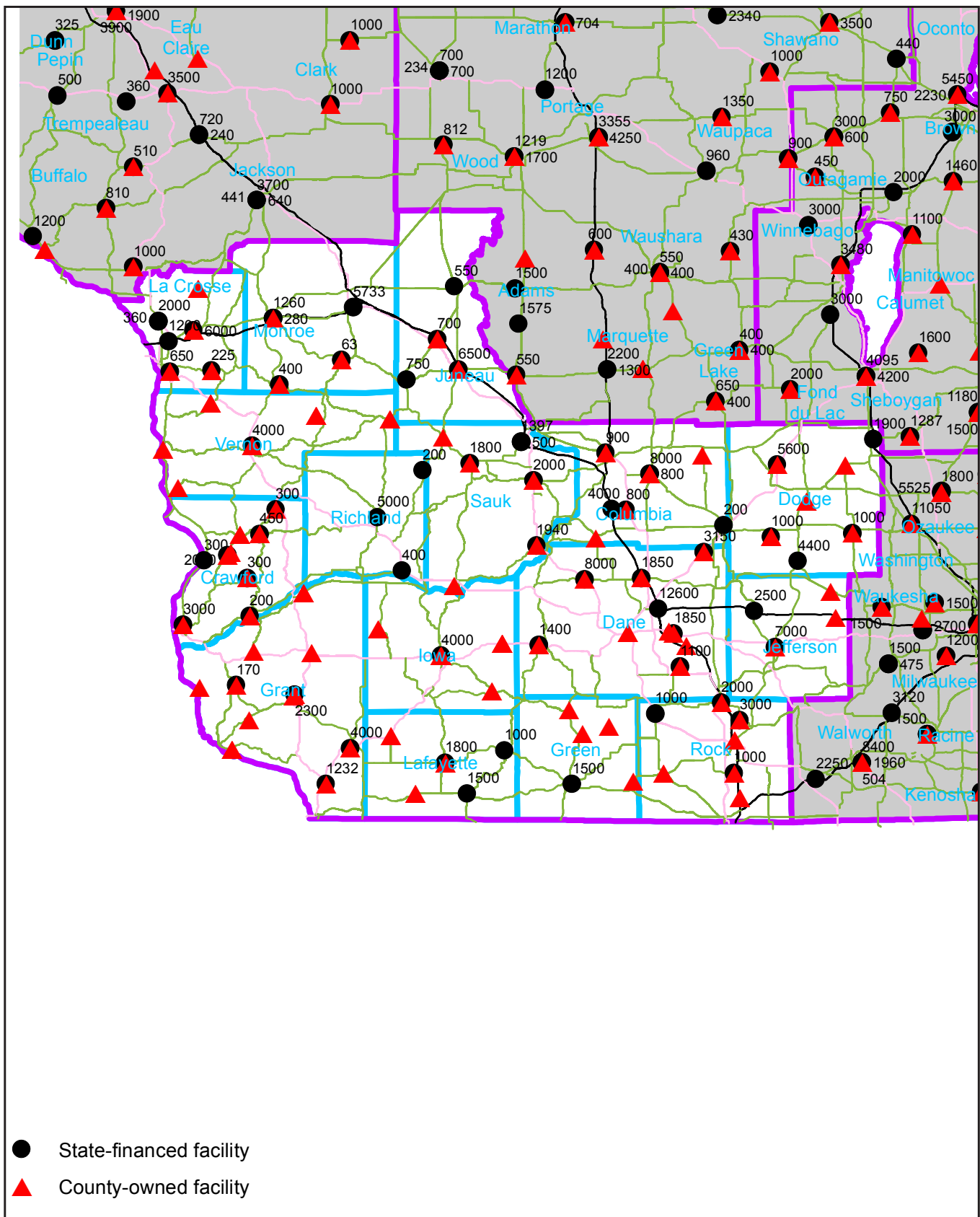


Numbered labels indicate the shed capacity allotted to WisDOT, in tons.

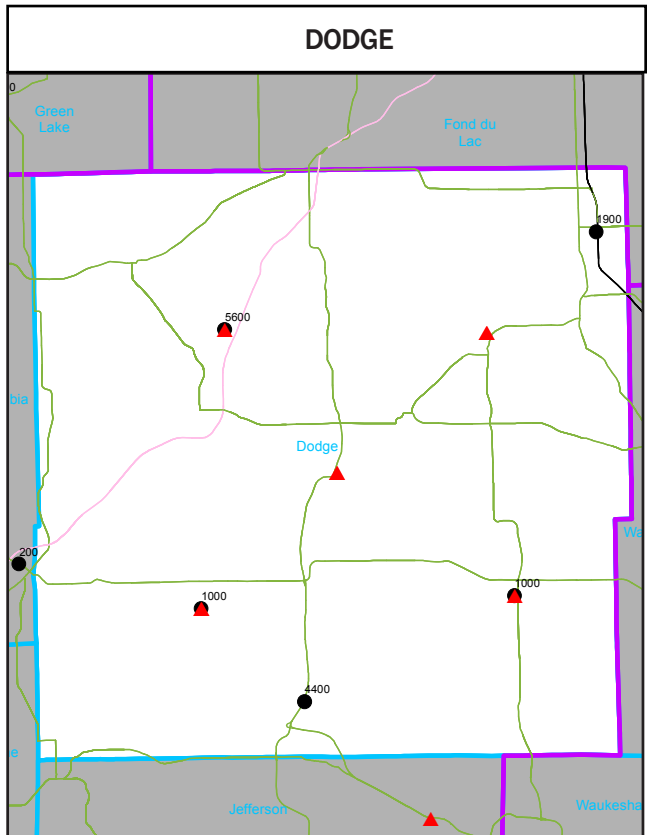
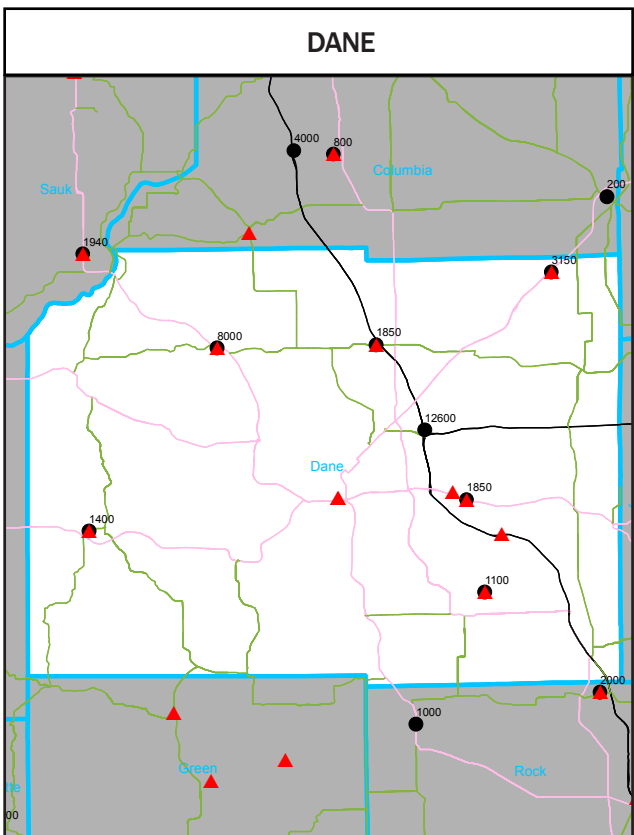
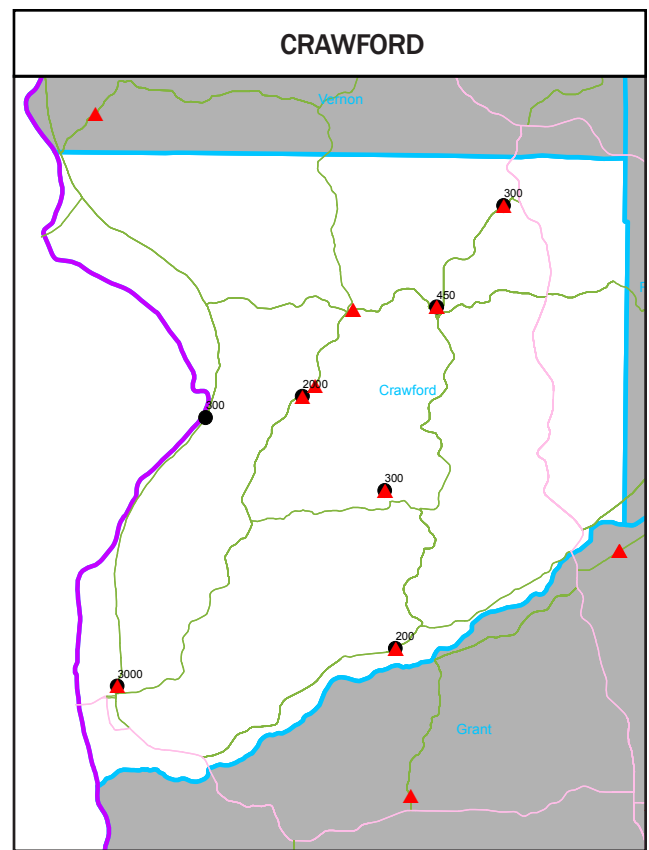
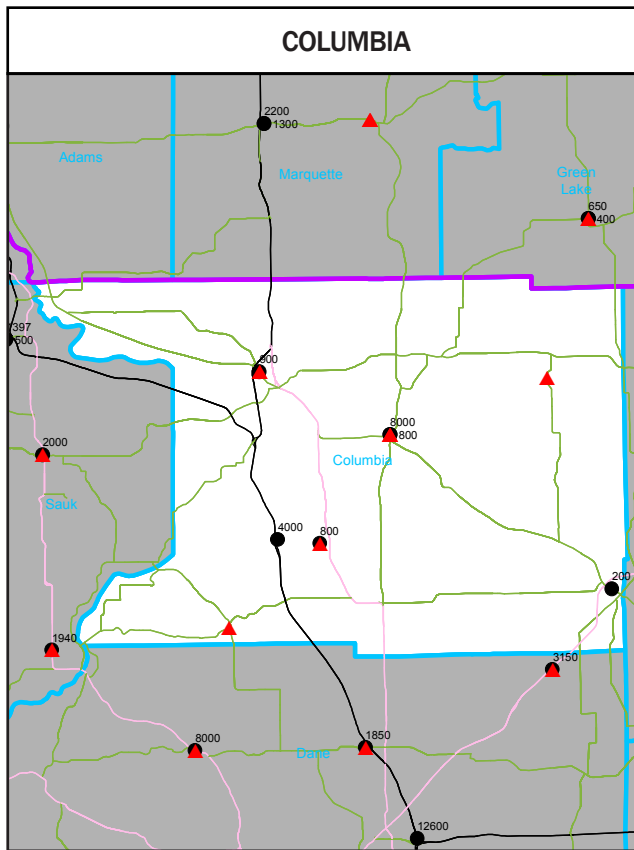


Numbered labels indicate the shed capacity allotted to WisDOT, in tons.

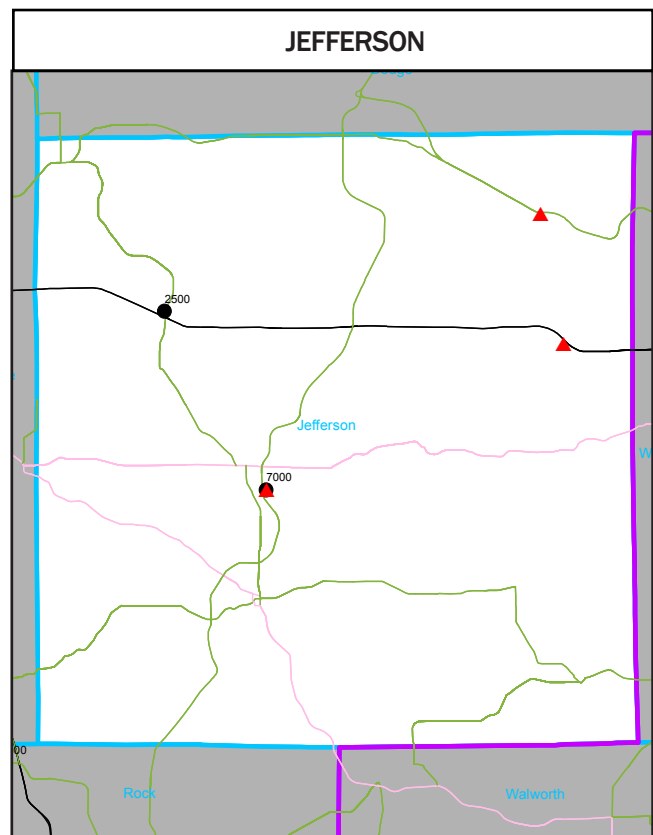
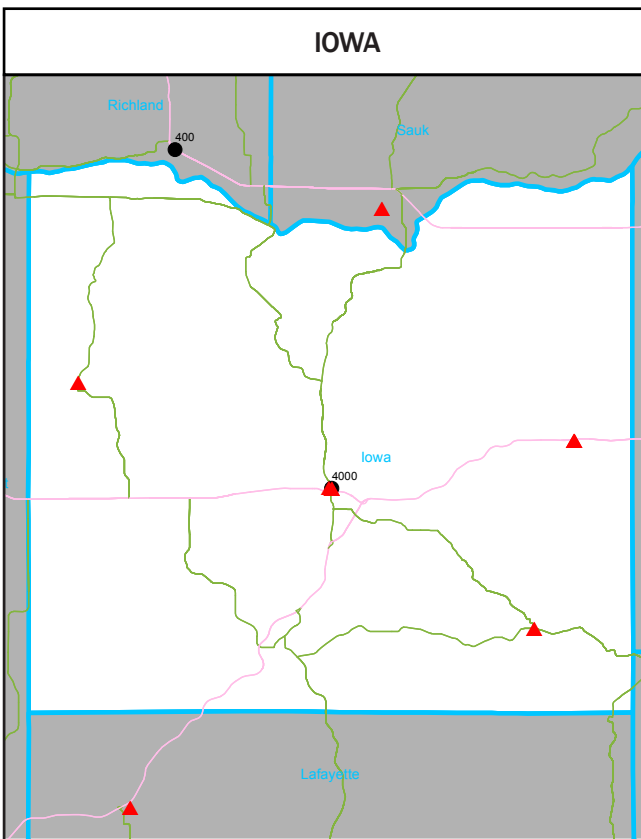
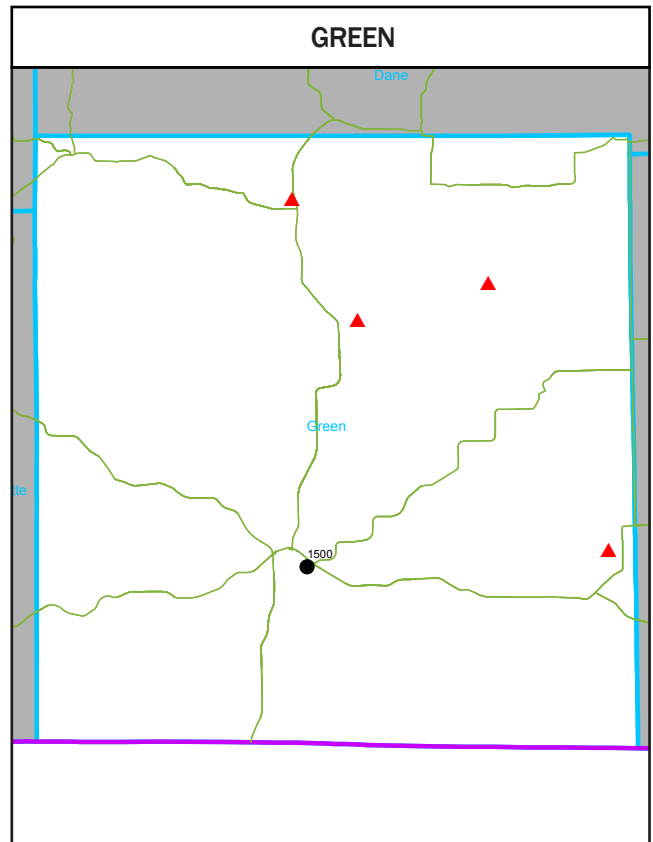
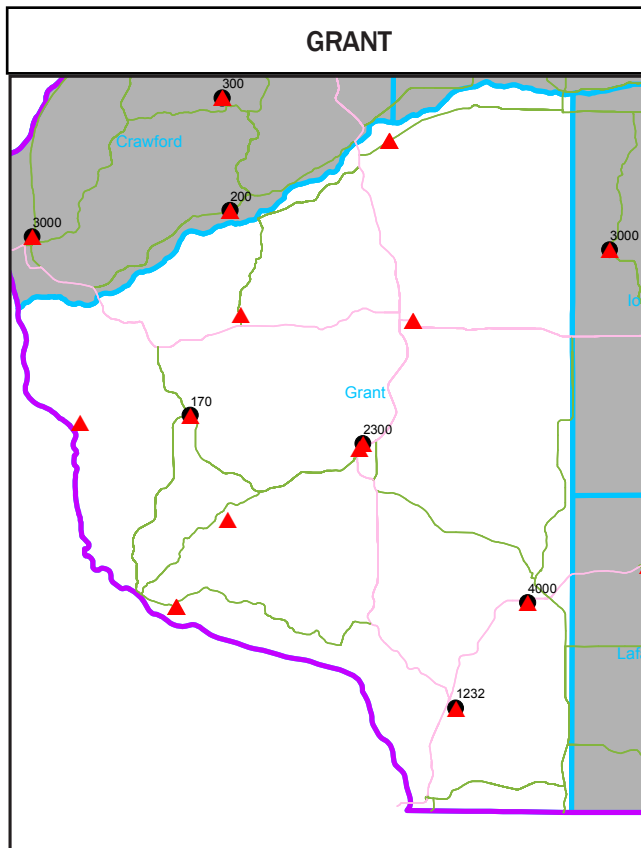
Southwest Region Salt Sheds



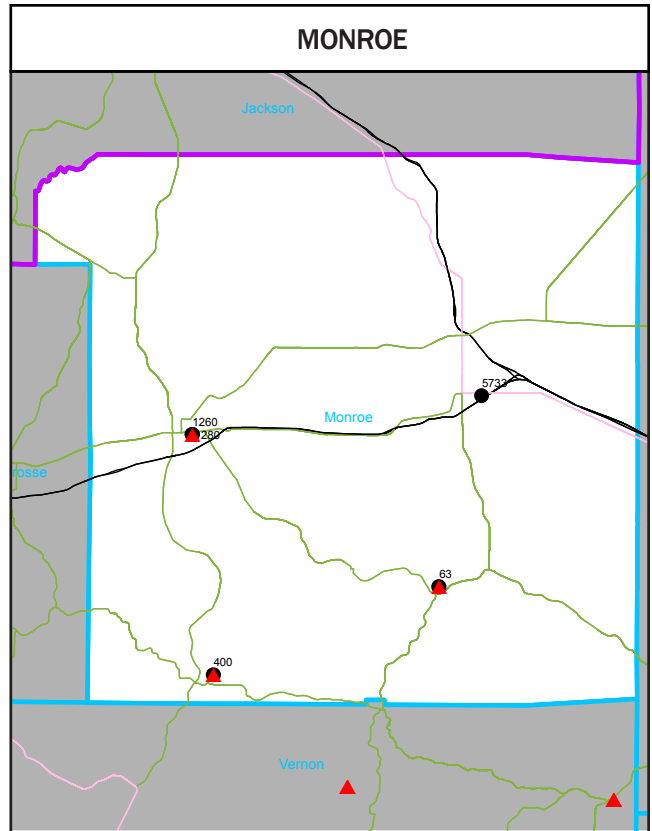
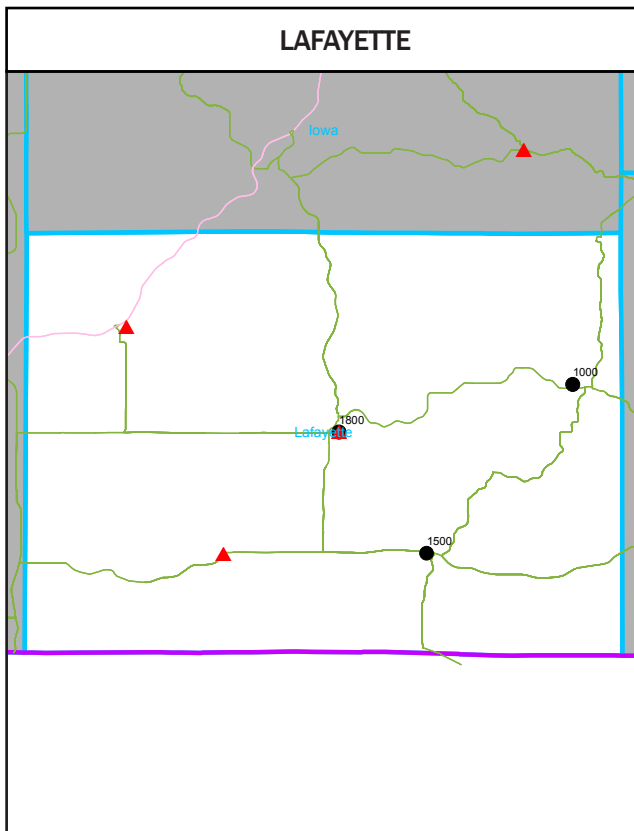
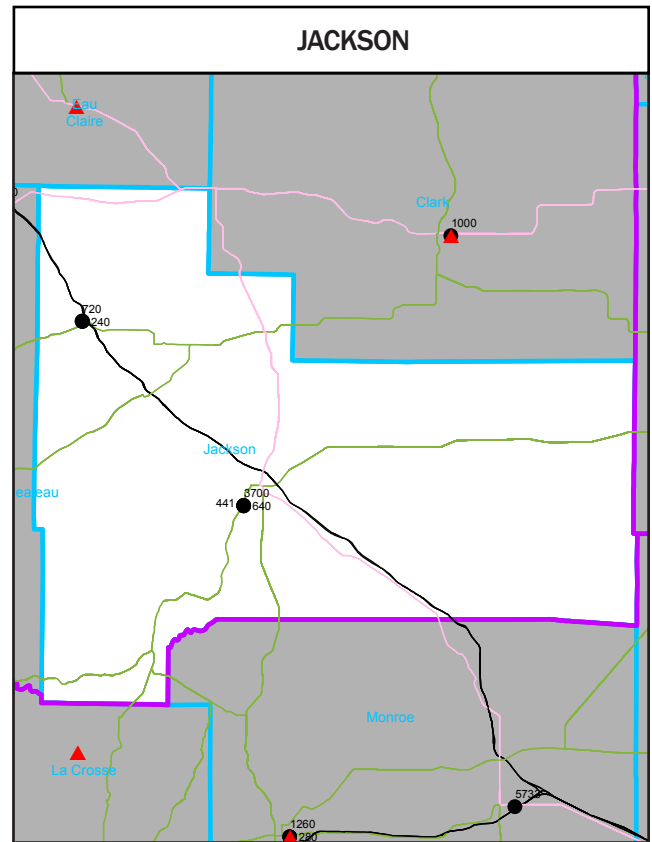
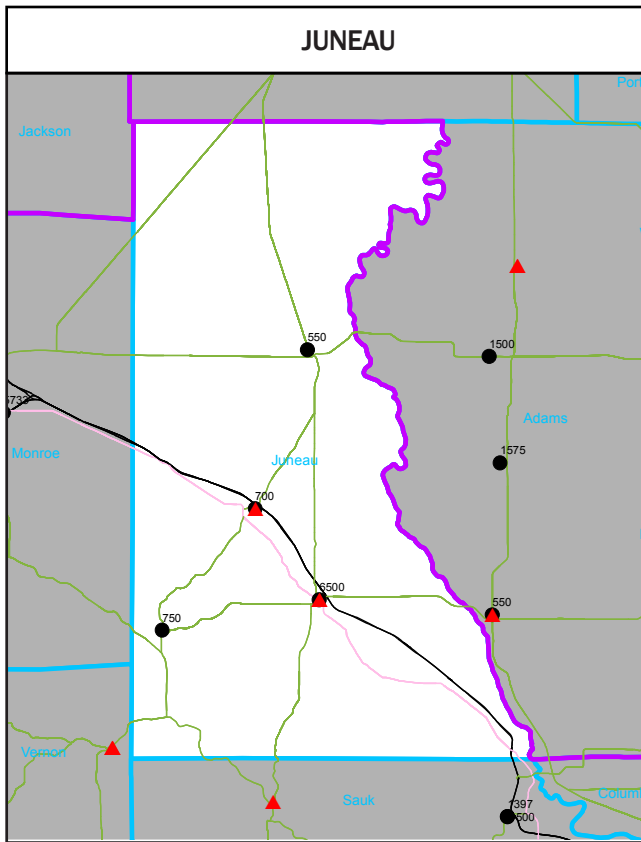
Numbered labels indicate the shed capacity allotted to WisDOT, in tons.



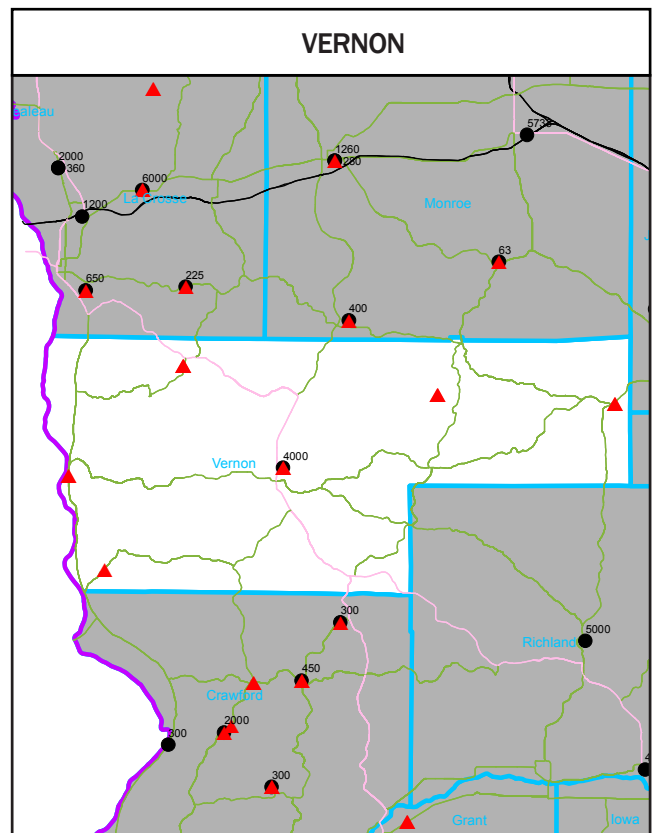
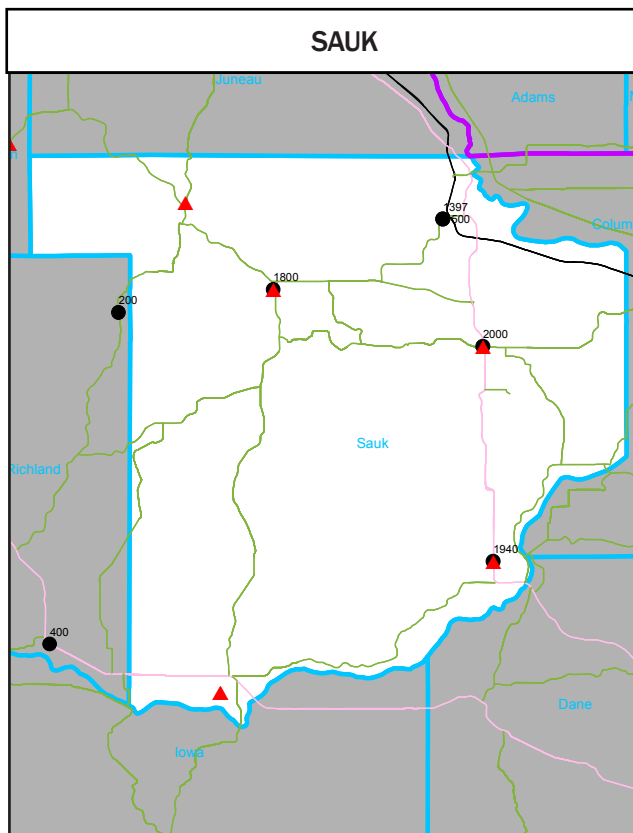
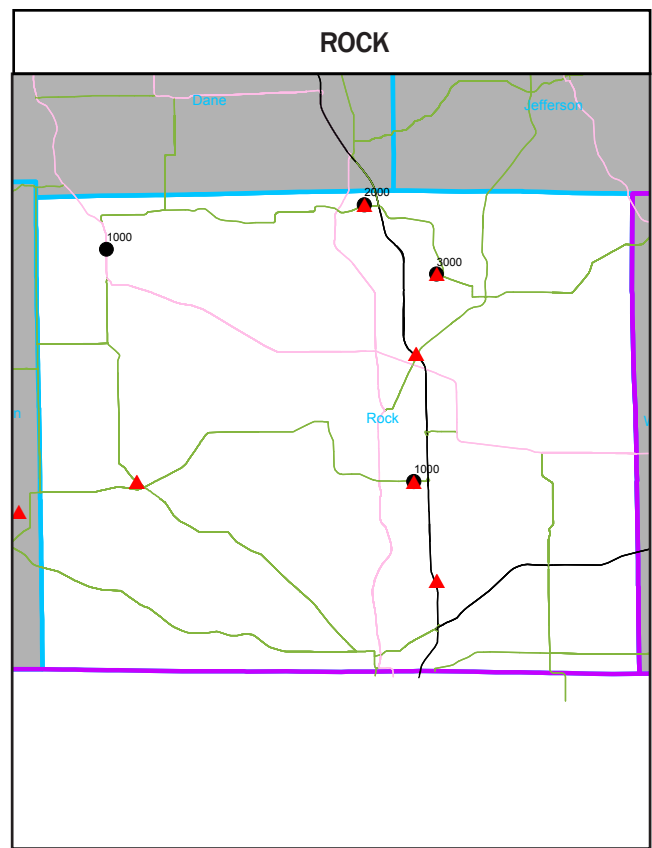
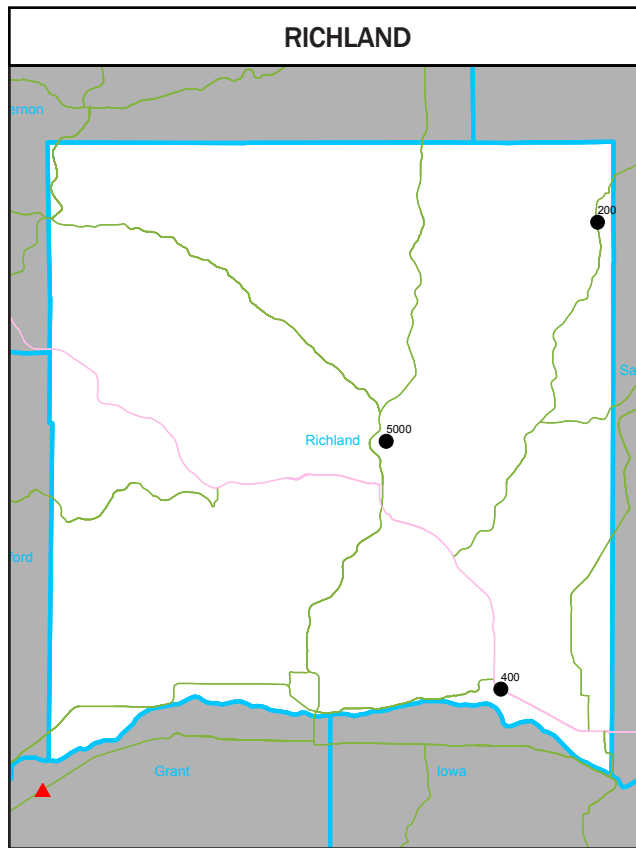
Numbered labels indicate the shed capacity allotted to WisDOT, in tons.



Numbered labels indicate the shed capacity allotted to WisDOT, in tons.



Numbered labels indicate the shed capacity allotted to WisDOT, in tons.



Numbered labels indicate the shed capacity allotted to WisDOT, in tons.