Yellowstone River Cumulative Effects Study

Invasive Plant Information Summary

March 21, 2005

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Invasive Plants Information Summary

The information contained in the "Invasive Plant Species Information Summary" was compiled in order to provide a historical, biological, and scientific perspective of the role that invasive plant species has played in the ecological status of the lower Yellowstone River corridor. This document contains biological information relevant to the plant species that are known to be present within the project area; along with information relevant to additional species that are known to be affecting various areas of Montana as well.

The intent of this compilation document was to give the stakeholders of Montana a "snapshot" of the current status of the invasive plant problem that exists, along with an overview of the various methods that have been implemented in an effort to mitigate the impacts of these species. Invasive plants threaten the long-term productivity of Montana's grazing lands, wildlands, and riparian areas by reducing bio-diversity and increasing soil erosion. These aggressive plants displace native species, change plant community structure, degrade or eliminate habitat for wildlife and domestic livestock usage.

Determining the most effective methods or best management practices to reduce undesirable plant community invasion requires performing site - based assessments to make sound, ecologically based decisions. As a general rule, land managers must be willing to embrace incorporating integrated management strategies to successfully improve the plant community structure of any given site. Many variables such as soils types, existing plant community composition, and others, will need to be considered when developing desired land use objectives. A conceptual understanding of plant succession is considered to be helpful because it defines how plant communities change. It is generally accepted by ecologists that there are three main causes of succession; site availability (plant or soil disturbance), species availability (colonization), and species performance.

It is our hope that the information gathered, along with the other environmental data that is acquired for the cumulative effect study of the lower Yellowstone River corridor, may be used to develop scientifically sound land management strategies for the long-term viability of this vital natural resource.

Historical Overview

During the research phase of compiling existing information for the invasive plant information summary within the Yellowstone River riparian corridor, it became quite evident that very little quantifiable management assessment information existed. In an effort to better "tie together" the biological information, GIS plants inventory data, and the input from local weed management resources that is contained in the invasive plant information summary; a brief historical overview could provide a better understanding of the invasive plants picture for Montana.

Legal Definition(s)

In 1939, a law known as the "Montana County Weed Control Act" (MCA Title 7, Chapter 22, Part 21) was passed that created a platform for the establishment of weed management entities at the county level. This law, which is under the administrative responsibility of the Montana Department of

Agriculture, identifies the various statutory requirements for the management of "noxious weeds" in Montana. The definition of noxious weeds is defined within the law as: " any exotic plant species that is established or that may be introduced in the state that may render land unfit for agriculture, forestry, wildlife, or other beneficial uses or that may harm native plant communities". This law, which has gone through many levels of revision and repeal, is still the driving force behind much of the management of exotic plant species in Montana. The Montana County Weed Act also establishes the ability to designate which invasive plant species are defined as "noxious" by either the Department of Agriculture or the County Weed Control Boards. This legal designation becomes particularly important when you consider which invasive plant communities or species have been prioritized for the implementation of various integrated control strategies, under the regulatory authority as defined in the law. Therefore, the species that have been designated as "noxious" have been subjected to a greater amount of varied control practices over the last couple of decades.

Montana County Weed Districts

Although the Montana County Weed Control Act was passed in 1939, many of the county weed districts did not get established until the 1960's. As these county weed districts became established they began their task of defining their roles and priorities, through the development of local weed management plans. Even today, the role and priority of these programs vary greatly, dependant on many factors. Some of the programs have become very advanced technologically; while others are very limited and have not changed much over the years. The limitations of these county weed programs, as with other county programs is primarily due to limited funding. Some Montana counties have very sparse populations, and thus very limited tax bases with which to meet the needs of the prospective county. In general, county weed programs primarily focused on dealing with invasive plant problems that existed in the road rights of way, and county owned properties, and were not heavily involved with either privately owned or other publicly managed lands. Due in large part to some additions to the Montana County Weed Act, county weed programs became much more involved with federal and state government agencies (USFS / BLM/ FWP/DNRC), which are responsible for the management of public lands. In many cases, the county weed programs are actually performing the weed management for the federal and state agencies at the local level.

In 1985, the Montana Noxious Weed Trust Fund was established for the purpose of providing financial assistance for the management of noxious weeds across Montana. Since it's inception, the Montana Noxious Weed Trust Fund (MNWTF) has provided over 20 Million dollars of financial assistance to projects for noxious weed control, which covers research, education, and local cooperative management projects for private landowner groups. While the MNWTF has been an outstanding program, it too is not enough to deal with the ever-increasing problems relating to invasive plants. As previously mentioned, due to some limitations in manpower and technical proficiency, some county weed programs have not had the ability to expand their involvement with the MNWTF grants program to it's full potential. The Montana Department of Agriculture, who administers the MNWTF, has continually worked hard to create innovative methods that will allow every county across Montana to benefit from this program.

Montana & North Dakota Noxious Weed Lists

Montana State Listed Noxious Weeds

Category 1

Category 1 noxious weeds are weeds that are currently established and generally widespread in many counties of the state. Management criteria include awareness and education, containment, and suppression of existing infestations and prevention of new infestations. These weeds are capable of rapid spread and render land unfit or greatly limit beneficial uses.

Canada Thistle *(Cirsium arvense)*
Field Bindweed *(Convolvulus arvensis)*
Whitetop or Hoary Cress *(Cardaria draba)*
Leafy Spurge *(Euphorbia esula)*
Russian Knapweed *(Centaurea repens)*
Spotted Knapweed *(Centaurea maculosa)*
Diffuse Knapweed *(Centaurea diffusa)*
Dalmation Toadflax *(Linaria dalmatica)*
St. Johnswort *(Hypericum perforatum)*
Sulfur (Erect) Cinquefoil *(Potentilla recta)*
Common Tansy *(Tanacetum vulgare)*
Ox-eye Daisy *(Chrysanthemum leucanthemum L.)*
Houndstongue *(Cynoglossum officinale L.)*
Yellow Toadflax *(Linaria vulgaris)*

Category 2

Category 2 noxious weeds have recently been introduced into the state or are rapidly spreading from their current infestation sites. These weeds are capable of rapid spread and invasion of lands, rendering lands unfit for beneficial uses. Management criteria includes awareness and education, monitoring and containment of known infestations and eradication where possible.

Dyers Woad *(Isatis tinctoria)*
Purple Loosestrife or Lythrum *(Lythrum salicaria, L. virgatum, and any hybrid crosses thereof)*
Tansy Ragwort *(Senecio jacobea L.)*
Meadow Hawkweed Complex *(Hieracium pratense, H. floribundum, H. piloselloides)*
Orange Hawkweed *(Hieracium aurantiacum L.)*
Tall Buttercup *(Ranunculus acris L.)*
Tamarisk [Saltcedar] *(Tamarix spp.)*
Perennial Pepperweed *(Lepidium latifolium)*

Category 3

Category 3 noxious weeds have not been detected in the state or may be found only in small, scattered, localized infestations. Management criteria include awareness and education, early detection and immediate action to eradicate infestations. These weeds are known pests in nearby states and are capable of rapid spread and render land unfit for beneficial uses.

Yellow Starthistle *(Centaurea solstitialis)*
Common Crupina *(Crupina vulgaris)*
Rush Skeletonweed *(Chondrilla juncea)*
Eurasian water milfoil *(Myriophyllum spicatum)*
Yellow flag iris *(Iris pseudacorus)*

North Dakota State Listed Noxious Weeds

Weeds declared noxious shall be confined to weeds that are difficult to control, easily spread, and injurious to public health, crops, livestock, land or other property. The following weeds have been declared noxious for the purpose of North Dakota Century Code chapter 63-0 1. 1:

Absinth Wormwood *(Artemisia absinthium L.)*
Canada thistle *(Cirsium arvense (L.) Scop.)*
Dalmation toadflax *(Linaria genistifolia ssp. dalmatica)*
Diffuse knapweed *(Centaurea diffusa Lam.)*
Field Bindweed *(Convolvulus arvensis L.)*
Leafy Spurge *(Euphorbia esula L.)*
Musk thistle *(Carduus nutans L.)*
Purple loosestrife *(Lythrum salicaria L., Lythrum virgatum L. and all cultivars)*
Russian knapweed *(Acroptilon repens (L.) DC.)*
Saltcedar *(Tamarix ramosissima Ledeb., including T. chinensis and T. parviflora DC.)*
Spotted knapweed *(Centaurea maculosa Lam.)*
Yellow starthistle *(Centaurea solstitialis L.)*

County Weed District Listed Noxious Weeds

Highlight Indicates Counties That Did Not Provide Information

Park County, MT

No Additional Weeds Listed

Rosebud County, MT

1. Puncturevine *(Tribulus terrestris L.)*
2. Poison Hemlock *(Conium maculatum L.)*
3. Kochia *(Scoparia L. Schrad)*

Sweet Grass County, MT

1. Blue Weed
2. Musk Thistle
3. Black Henbane
4. Woodland Sage
5. Urban Spurge

Custer County, MT

No Additional Weeds Listed

Stillwater County, MT

Prairie County, MT

No additional Weeds Listed

Carbon County, MT

1. Absinth Wormwood

Dawson County, MT

No Additional Weeds Listed

Yellowstone County, MT

1. Poison Hemlock (Conium maculatum L.)
2. Puncturevine (Tribulus terrestris L.)
3. Common Mullein (Verbascum thapsus L.)
   Showy Milkweed (Asclepias speciosa Torr.)
4. Western Water Hemlock (Cicuta douglasii)
5. Common Teasel (Dipsacus fullonum L.)
6. Blue Mustard (Corispora tenella)

Richland County, MT

No Additional Weeds Listed

Treasure County, MT

No Additional Weeds Listed

McKenzie County, ND

No Additional Weeds Listed

More detailed information on the above listed invasive species can be found in Appendix A.

Control Methods

Introduction

Records of control measures through out the counties in the Yellowstone River corridor are varied. Some of the counties in the corridor have full time weed coordinators while others employ only seasonal spray hands. As these personnel are replaced over the years, the control methods that have been utilized are lost.

The information in the following sections deals primarily with herbicide and insect biological controls. Mechanical controls have been used from time to time on an experimental basis. We could find no definitive record of mechanical controls being utilized on a large or ongoing scale.

The following sections should however provide a brief overview of some of the more popularly utilized control methods.

Biocontrol insects used, in the study area, by county

Highlight Indicates Counties That Did Not Provide Information

Park County, MT

1. Knapweed Root Weevil *(Cyphonceonus achates)*
2. Knapweed Flower Weevil *(Larinus minutis)*

Sweet Grass County, MT

1. Apthona spp.

Stillwater County, MT

Carbon County, MT

1. Thistle Head Weevil *(Rhinocyllus conicus)*
2. Brown Legged Leafy Spurge Flea Beetle *(Apthona Lacertosa)*
3. Black Dot Leafy Spurge Flea Beetle *(Apthona Nigriscutis)*

Yellowstone County, MT

3. Copper Leafy Spurge Flea Beetle *(Apthona Flava)*
4. Brown Legged Leafy Spurge Flea Beetle *(Apthona Lacertosa)*
5. Defoliating Hemlock Moth *(Agonopterix alstroemeriana)*
6. Black Dot Leafy Spurge Flea Beetle *(Apthona Nigriscutis)*
7. Knapweed Root Weevil *(Cyphonceonus achates)*
8. Leafy Spurge Stem Boring Weevil *(Oberea erythrocephala)*
9. Brown Dot Leafy Spurge Flea Beetle *(Apthona Cyparissiae)*
8. Knapweed Flower Weevil *(Larinus minutis)*

Treasure County, MT

1. Brown Legged Leafy Spurge Flea Beetle (Apthona Lacertosa)
2. Canada Thistle Root Borer *(spp. Unknown)*

Rosebud County, MT

No Biocontrol Agents Used

Custer County, MT

No Biocontrol Agents Used

Prairie County, MT

1. Black Dot Leafy Spurge Flea Beetle *(Apthona Nigriscutis)*
2. Brown Legged Leafy Spurge Flea Beetle *(Apthona Lacertosa)*

Dawson County, MT

1. Leafy Spurge Flea Beetles *(spp. Unknown)*

Richland County, MT

1. Apthona Flea Beetles *(spp. Unknown)*

McKenzie County, ND

No Biocontrol Agents Used

More information about the above listed biocontrol agents can be found in Appendix B

Herbicide Controls

Introduction

Follow is a list of some of the herbicides that are known to have been used or are currently being used for noxious weed control in the Yellowstone River corridor. This list is a compilation of documents from the *Montana Pesticide Education Program*, *Iowa State University Extension Service*, *Purdue University Extension Service*, and the *University of Wisconsin Extension Service*. Each of the documents this information was selected from can be read in their entirety on the reference CD in the pesticide folder. The commonly applied to column may not include all plants a particular herbicide was applied to.

An additional reference document for herbicide recommendations for control of specific plants is *The Nature Conservancy Weed Control Methods Handbook*. Due to copyright restrictions this document could not be included as part of reference CD. It is available for free download at:

http://tncweeds.ucdavis.edu/handbook.html

Auxin Growth Regulators

The effects associated with auxins help set them apart from other downwardly mobile herbicides. Bending and twisting of leaves and stems is evident almost immediately after application. Delayed symptom development includes root formation on dicot stems; misshapened leaves, stems, and flowers; and abnormal roots.
Soil activity varies from almost none to long residual depending on herbicide and dose.
Auxin growth regulator herbicides are used for control of annual, simple perennial, and creeping perennial broadleaves in grass crops (corn, small grains, sorghum, turf, pastures, sodded roadsides and rangeland) and in non-crop situations. All are organic acids which take on a negative charge after ionization of acids and salts. Esters are hydrolyzed to acids or salts in both plants and soils. Injury to off-target vegetation is a major problem associated with these herbicides.

	Common Name	Trade Name	Commonly Applied To
Phenoxyaliphatic Acid Herbicides	2,4-D		Various
Benzoic Acids	dicamba	Banvel Clarity Vanquish	Various
Picolinic Acids (Pyridines) and Relatives	picloram	Tordon	Leafy Spurge Spotted Knapweed Diffuse Knapweed Canada Thistle Houndstongue
	clopyralid	Stinger Transline	Various
	triclopyr	Garlon Remedy	Salt Cedar
	fluroxypyr	Starane Vista	Kochia

Amino Acid Inhibitors (Aromatic)

Glyphosate and sulfosate are the compounds with this mode of action. Uses are limited to foliar applications only, since these chemicals are rapidly inactivated in the soil. Symptoms include yellowing of new growth and death of treated plants in days to weeks. These relatively nonselective compounds control annual grasses, annual broadleaves, johnsongrass, quackgrass, yellow nutsedge, cool season pasture and turf grasses, cattail, Canada thistle, hemp dogbane, Jerusalem artichoke, poison ivy, and multiflora rose. Glyphosate tolerant cultivars of soybeans (Roundup Ready) are currently being marketed. Corn and other glyphosate tolerant crops are being tested for future release.

	Common Name	Trade Name	Commonly Applied To
	glyphosate	Roundup Ultra Glypro Glystar Rodeo Buccaneer	Various

Amino Acid Inhibitors [Branched-chain (AHAS/ALS)]

Several groups of different chemistry have this same mode of action. Shoot meristems cease growth; yellow, pink and purple symptoms appear; roots tend to develop poorly; and the secondary roots are shortened and all nearly the same length producing a "bottlebrush" appearance. Complete symptom development is very slow and requires two to three weeks or more. Late postemergence applications of some of these herbicides used on corn may result in malformed (bottle shaped) ears.

	Common Name	Trade Name	Commonly Applied to
Imidazolinones	imazapyr	Arsenal Habitat	Salt Cedar
Sulfonylureas	chlorsulfuron	Telar	Dalmation Toadflax
	sulfometuron	Oust	
	metsulfuron	Escort	Whitetop Dalmation Toadflax

Cell Membrane Destroyers

Compounds in this group result in rapid disruption of cell membranes and very rapid kill. The bipyridyliums and the diphenyl ethers penetrate into the cytoplasm, cause the formation of peroxides and free electrons (light is required) which destroy the cell membranes almost immediately. Herbicidal oils dissolve membranes directly. Rapid destruction of cell membranes prevents translocation to other regions of the plant. Severe injury is evident hours after application, first as water-soaked areas which later turn yellow or brown. Maximum kill is attained in a week or less. Partial coverage of a plant with spray results in spotting and/or partial shoot kill. New growth on surviving plants will be normal in appearance. Foliar activity alone can provide only shoot kill.

	Common Name	Trade Name	Commonly Applied to
Bipyridyliums	paraquat	Gramoxone Max	Various

Existing GIS and Inventory Data

Introduction

There have been many noxious weed inventory projects conducted along the Yellowstone River Corridor. Unfortunately, due to turn over in weed management personnel, much of this data has been lost or the collection format used at the time is obsolete and has made it inaccessible.

The few projects we were able to locate do have very usable data as can be seen in the following sections. Using the 2000-2001 Cooperative Helicopter project as only one example, however, it becomes clear that the data is in need of updating.

It should also be noted that inventory projects are perpetually on going. County weed districts, state and federal agencies and private landowners perform these. By the time study tasks 2 and 3 are performed, additional inventory data may exist beyond those projects listed below. Acquisition and utilization, where possible, of these datasets will be ongoing as the rest of the study task progress.

The digital data or shapefiles of these inventory projects have been made available on the C.E.S. Invasive Plant Project website. A link to this site can be found at http://www.hysham.com/

Each of the listed GIS inventory map project atlases have been included as appendices to this document

Montana Section Based Weed Mapping Project

Background

In spring of 1997, the Montana Noxious Weed Trust Fund requested that the Weed Survey and Mapping System Project take on a special activity, focused on surveying the distribution of five important noxious weeds within Montana counties. This section-based project is in addition to the statewide 1:24,000 inventories, which is the major objective of the Montana Noxious Weed Survey and Mapping System. The section-based project will provide statewide data at a faster rate than can be obtained from the entire system, which covers more than 16 weeds at a much greater level of detail. Until more counties become trained and begin to apply the techniques of the larger system, projects such as this section-based survey will be needed to fill in any current gaps.

The section-based project was undertaken with the following goals:

- to produce useful distribution data for leafy spurge, Dalmatian toadflax, sulfur cinquefoil, Russian knapweed, and spotted knapweed.
- to record for each section in each county the status of each of the weeds: present, absent or status unknown.
- to accurately calculate the total number of sections infested for the five selected weeds.
- to provide the results on section-based maps for each county

Procedures

All county weed supervisors were sent sets of maps for their counties in early March 1998.

Supervisors were requested to involve other persons and agencies active in weed control in their counties.

Instructions on marking the maps and keeping records on data sources were included with the maps

A set of maps was also sent to weed managers in Yellowstone National Park for those parts of the park in Montana, which is considered part of any county.

Status of Section-Based Mapping Project

Data were collected and mapped by Montana State University-Bozeman, and then the project was transferred to Montana Department of Agriculture (MDA) in Helena. At that time, the ongoing project was directed by Barbra Mullin. As of 2003, Jim Larson of the Stillwater County GIS Department is supervising the project.

Section-based maps have been completed for every county in the State for the five selected weeds. Questions remain about interpretation of the data. For leafy spurge, if all sections reported as infested were 100% infested, the total number of acres for leafy spurge would be 6.9 million. If those sections averaged only 10% infested, then the number would be 697,000 acres of leafy spurge in the state. A questionnaire in which county weed supervisors were asked to estimate acres of weeds in their counties indicated that 1,000,000 acres were infested with leafy spurge. The section-based maps show general areas where these infestations occur.

As part of an effort with the Montana State Library Natural Resources Information System (NRIS) a new online updatable system has been designed. This will allow county weed districts to log into a password-protected system and make updates/corrections to the section based data. Roll out for this project is slated for Fall 2004. The project plans include completion of the remaining Category 1 Weeds by mid 2005.

McKenzie County, North Dakota GIS Data

Yellowstone River Salt Cedar Project

The following atlas pages are the result of point data collected by McKenzie County Weed Control during the month of June 2002.

No additional information concerning this GIS data was provided. Specific question relating to this data/project would best be directed to Mr. Odin Hein with McKenzie County Weed Department. Contact information for Mr. Hein is provided in Appendix G

2000 & 2001 Helicopter Noxious Weed Inventories

Background

This Cooperative project was begun in 1998 as the brainchild of Hubert Livingston. Mr. Livingston was the director of noxious weed management for the Bureau of Land Management, Miles City District. Working together with Vince Thomas, then the Rosebud County Weed Supervisor, they began aerial mapping of Leafy Spurge in southern Rosebud County, and the Custer National Forest, Ashland Ranger District. The bulk of the funding came from the Bureau of Land Management. However, Rosebud County Weed District, Montana Department of Natural Resources and Conservation, Montana Department of Fish Wildlife, And Parks, USDA Forest Service, and almost all of the other eastern Montana counties became cooperators in the project at some time during its four year run.

This project was not only an inventory project but an educational one as well. The actual "spotters" were Rosebud County High School Students primarily from Forsyth, and Rosebud. These students were under the direction of Mr. George Simmons the Forsyth High School Vo-ag instructor.

In 2000, the focus expanded to include Salt Cedar on the Big Horn, and Yellowstone Rivers. In 2001, the Yellowstone River was re-inventoried from the Big Horn River to the Confluence with the Missouri. The project then turned west and inventoried the Missouri River from the Yellowstone Confluence to the base of the Fort Peck Dam.

This aerial inventory project was conducted with the following goals/results

- Determine the scope of Leafy Spurge and Salt Cedar infestations.
- Provide an educational opportunity for high school students
- This data was used to lobby the Interior Secretary to increase funding for noxious weed control on BLM lands in Eastern Montana. This resulted in the creation of new cooperative agreements with the counties who in turn were able to increase efforts with BLM leaseholders.

Procedures

Two independent GPS systems were utilized in the helicopter during this inventory project. The first GPS kept a track log that was utilized to make sure that all land areas had been examined. The second GPS was utilized to actually collect the point, polyline, and polygon data. The data collection procedure set forth by the state noxious weed mapping committee was utilized in order for this data to be input into the state noxious weed database.

The process was kept as simple as possible. The "spotters" would locate an infestation and then determine how to collect the GPS data. Smaller infestations would be collected by hovering the helicopter over the location and takeing point data. In areas such as a creek drainage where the infestation was long and narrow a polyline would be utilized. Where a very large infestation was located a polygon edge would be flown.

At the same time the helicopter was flying the rest of the ground-based crew would spend their time ground truthing the previous days data where possible. Making sure, for example that the plant that was mapped the previous day as Leafy Spurge wasn't sweet clover or a mustard species.

Project Status

It is unclear why the aerial mapping project was suspended but is assumed to have been a lack of ongoing funding. At one point there was discussion that the project would complete all of Eastern Montana and repeat the process on a three or five year rotating basis.

Yellowstone County, Montana 2002-2003
Yellowstone River Corridor Noxious Weed Inventory Project

Background

This project, conducted by Yellowstone County Weed Department, was not only beneficial for it's value as an inventory but an educational tool. The project was conducted by student interns from Montana State University – Billings, designed, and overseen by Hysham Enterprises.

Objectives and goals / end products of this project:

- Better, establish what invasive species are present within the Yellowstone River Corridor as it crosses Yellowstone County.
- Make an estimate of the quantity of infested acreage by weed species.
- Utilize the time spent with private property owners to both educate and enlighten as to what noxious weed infestations were present on their property.
- As a final deliverable product a weed id guide, herbicide recommendation guide, and a map of the infestations, segregated by property owner, were mailed to each project cooperator.

Procedures

Using GPS systems the group of interns performed an on the ground survey by hiking along the 1 mile wide corridor with the Yellowstone River at it's center, covering predefined polygons that were displayed on the hand held GPS units. The polygon areas were selected based on property owner permissions. Attention was also given to covering all public land parcels within the corridor.

Customized data collection software based on the procedures set by the state noxious weed mapping committee was utilized to collect primarily point infestation data. A mathematical formula was then applied to the collected data to estimate the infested acres. This acreage estimation is included with the project atlas in Appendix F

Project Status

The final phase of this project was completed during the fall of 2003.

Yellowstone County, Montana 2004
Yellowstone River Tributary Noxious Weed Inventory Project

Concentrating on Salt Cedar alone this project was an aerial inventory of the major tributaries of the Yellowstone River in Yellowstone County.

The intent of this project is to build upon the previous ground based inventory and attempt to determine if the spread of Salt Cedar is moving from the tributaries to the Yellowstone River or vice versa.

At the time of this publication, the summary of the data and processing of the GIS data are incomplete. This data may be included as a part of this document at a later date.

GIS data availability

The GIS data from the projects described above is available at the C.E.S. invasive study website:

http://www.hysham.com/litreview/

Local Comments / Perspective

During the development of the Invasive Plants Information summary, an internet- based website product was developed in order to allow local weed management specialists to provide their historical information and to add their comments regarding the successes and challenges that they face in dealing with invasive plants issues. Enclosed are comments from the various federal, state, and county based weed management professionals that may help provide some insight into the history of their programs, along with any additional comments regarding invasive plants that they may choose to share.

Each of the counties was asked to take a few minutes of their time and fill out two separate Internet based forms. The first of these was to collect information about the weed species each county knew was in the river corridor, and any biocontrol agents that had been used. They were also asked to provide a brief comment about the primary species of concern and any comments relating to the cumulative effect study.

The second form was more specific in asking:

1. What methods are you utilizing in your county to address the noxious weed problem and what failures and/or successes have you had from these efforts.

2. What additional data (i.e. inventory, other research) needs, if any, do you feel are needed to assist you in elevating your counties noxious weed program to an even more effective level.

The ongoing input of each of these as well as other private and public land owners/managers will be extremely valuable. Keeping this vital communication open and free flowing should be kept as an objective in performing the remaining study tasks.

The following were the responses provided by each county and/or agency.

Park County, MT – Marty Malone
Primary species of concern.
"Knapweed, Dalmation Toadflax, Leafy Spurge. These species are a concern due to the restrictions in herbicides within the riparian zone and the landowners not wanting to expend limited weed control dollars on property that belongs to the state ie high water mark and the number of recreationists using the river bank for their private use."
Comments or concerns relating to the CES.
"Needs to be done quickly."
How are you addressing invasive species in your county
No Response Provided
What do you feel additional data needs might be:
No Response Provided

Sweet Grass County – Stacey Barta

Primary species of concern.

"Leafy Spurge, Spotted & Diffuse Knapweeds, and Dalmation Toad flax. These are species of concern due to being located in a riparian area; we are limited in terms of management options. These areas within the corridor are also prime for development, which can compound or create weed problems."

Comments or concerns relating to the CES.

"Let's hit the ground running and get some results."

How are you addressing invasive species in your county

"We strive to facilitate cooperative project areas. By doing this we also often seek cost share funding through the Montana Noxious Weed Trust Fund as well as other funding sources. This has proven to the most successful method for addressing noxious weed problems in Sweet Grass County. We also have had good success with face to face door to door education method. This helps to put a more human spin on a very serious environmental problem."

What do you feel additional data needs might be:

No Response Provided

Stillwater County

Primary species of concern.

No Response Provided

Comments or concerns relating to the CES.

No Response Provided

How are you addressing invasive species in your county

No Response Provided

What do you feel additional data needs might be:

No Response Provided

Carbon County, MT – Jerry Weber

Primary species of concern.

"Salt Cedar, Leafy Spurge, Spotted Knapweed"

Comments or concerns relating to the CES.

"After a recent mapping survey of the Clarks Fork River, the infestations of salt cedar and leafy spurge are overwhelming; especially from Bridger north to the confluence of the Yellowstone River."

How are you addressing invasive species in your county

"We are using herbicide and Bio Insect Control. Few bands of sheep are being run for weed control also."

What do you feel additional data needs might be:

"We need some long term research on salt cedar problems although we've only been into control measures since 2001. Perhaps this is happening as fast as it can."

Yellowstone County, MT – Scott Bockness

Primary species of concern.

"L.Spurge / Saltcedar / Knapweed - These species exist primarily in the river corridor and in limited quantities. The Y.River is a prime weed transportation vector and we are trying to do whatever we can to keep those vectors under control to keep the spread of those species within manageable levels."

Comments or concerns relating to the CES.

"It is very important to understand the link between invasive plant species and the ecological health of riparian waterways. The complexity of the varied land uses and it's impacts to the river ecological health and function is a key component in understanding how to design a best use plan for the future."

How are you addressing invasive species in your county

"We are and have utilized a broad spectrum of integrated invasive plant control practices such as: mowing, herbicide treatments, bio-control releases, etc. Our priorities have been to establish control of the transportation vectors such as road systems and waterways on a continuing basis. Additionally we have tried to provide resource assistance to private landowners who are dealing with exotic plant problems by providing either equipment, educational materials, or technical assistance that will allow the landowners make the best possible choices for their prospective situation. We believe that we have successfully reduced the problems in our road system, but our waterways continue to be a challenge to establish definitive progress. Yellowstone County has been and is in the midst of growth related land use changes, and these ongoing transitions make it difficult to mitigate the environmental consequences that are associated with expanding natural resource pressures."

What do you feel additional data needs might be:

"Additional vegetation inventories, on-going practical, solution based research, and additional financial resources will play a role in the success or failure of weed programs across Montana. Improving our understanding of the environment as a whole, should help establish a balance between the economic needs for the vested stakeholders of Montana, and the ability to make land use decisions that will allow our natural resources to be sustainable."

Treasure County, MT – Jennifer Cramer

Primary species of concern.

I believe they are all of concern but in this particular area, the ones that are showing the most rapid spread are Houndstoungue and Salt Cedar.

Comments or concerns relating to the CES.

"I hope that everyone is concerned with noxious weeds along the river. Also hope consideration the vast benefits provides for agricultural in these areas.

I believe recreational use of the river is going to increase as a mode of spread of noxious weeds in the Yellowstone River Corridor."

How are you addressing invasive species in your county

"On ground efforts. By this I mean meeting with landowners, education, being very visible to county population with work being done. I believe we have been fairly successful with most of the noxious weeds. We now have contracts/and or programs in place for most of the problems. No Yellow starthistle has been found for 2 years- the last was in Carbon County. We have helped Sanders with their YST infestation also. Rush Skeleton weed was found by MDT (we have a good working relationship with them) and ID'd by the Weed District. With assistance from MDA and Task Force, rewards were given to the two MDT people and we now have a plan in place. We have also done some fairly successful test plots and work on the Salt cedar.
I believe education (media, mailings etc) and on-ground work have been of the most help."

What do you feel additional data needs might be:

"I believe more involvement from agencies- with their technology would be of great help."

Rosebud County, MT – Amy Adler

Primary species of concern.

"Salt cedar is the most abundant within that corridor. Although we are probably most aggressive on Spotted & Russian Knapweed and leafy spurge that is along the river. We are not as aggressive on the Bindweed or Canada Thistle because of it being predominantly farm ground within the corridor."

Comments or concerns relating to the CES.

No Response Provided

How are you addressing invasive species in your county

"1. I'm trying to make myself more available to the public by spending more Time in the field. I have had good response to this and have a good working relationship with the landowners.

2. I have utilized my voluntary compliance program. We require that they enter into a 6-year noxious weed management plan. Hopefully this will get them started in a progressive direction."

What do you feel additional data needs might be:
"It would be nice if the state, & federal agencies & the University's that are doing research had a better way of sharing their information with the one that are working on the ground. When counties do the research we don't have the capabilities to distribute the information like they do."

Custer County, MT

Primary species of concern.
No Response Provided
Comments or concerns relating to the CES.
No Response Provided
How are you addressing invasive species in your county
No Response Provided
What do you feel additional data needs might be:
No Response Provided

Prairie County, MT – Sharla Sackman

Primary species of concern.
"Leafy Spurge is the most aggressive noxious weed in Prairie County. The Yellowstone and Powder rivers continue to spread leafy spurge down river. Additionally, small infestations are removing rangeland from productive grazing in the county, which is detrimental to Prairie County's number one industry- livestock."
Comments or concerns relating to the CES.
"The Yellowstone River is the main source of irrigation water in Prairie County. Sugar beet, pinto bean, corn, wheat and forage producers depend on the Yellowstone to sustain crop production."
How are you addressing invasive species in your county
"We have taken an integrated approach to the leafy spurge problem on the Yellowstone River. Leafy Spurge flea beetles (Apthona sp.) have been released on a large infestation, sheep have grazed the river corridor for a number of years, and herbicides have been used to control satellite infestation off the river. Several years ago, MSU had a leafy spurge test plot to test different treatment methods along the river. The sheep grazing project has probably had the largest impact. The sheep are able to prevent a large amount of leafy spurge from going to seed, slowing spread, and thinning stands. Herbicide limitations have made it difficult to clean up leafy spurge stands. *Saltcedar has been controlled using herbicides. Treatments have been successful thus far, but there is a continual seed source from up river so new plants are established all the time."*

What do you feel additional data needs might be:

"More work needs to be done to provide incentives for landowners to utilize sheep on leafy spurge. Work should continue on developing effective herbicides to control leafy spurge.

The biology of the saltcedar plant in Montana needs to be studied, along with possible treatment strategies.

At the same time, more research needs to be devoted to preventing the spread of noxious weeds and protecting uninfested lands."

Dawson County, MT

Primary species of concern.

"Salt Cedar and Leafy spurge would both be our #1 concern due to the large infestation of both species."

Comments or concerns relating to the CES.

No Response Provided

How are you addressing invasive species in your county

"Methods we are currently using is herbicide control as well as 2 grazing projects for leafy spurge. We also have a large-scale cost share program in the Richey country. The problems we are having is getting producers to cooperate and use the programs."

What do you feel additional data needs might be:

"To make our program more effective we need a large scale education program as well as a detailed mapping system of existing infestations."

Richland County, MT – Ken Babcock

Primary species of concern.

"I would have to say that Leafy Spurge is the primary noxious weed along the Yellowstone River in Richland County. Leafy Spurge covers more acres along the river than any other noxious weed. The Yellowstone River continues to spread Spurge alomg it's banks. Another potential weed that could have a large effect on the river and surounding area is Saltcedar."

Comments or concerns relating to the CES.

"Weed control in the riparian areas along the Yellowstone is difficult to maintain."

How are you addressing invasive species in your county

No Response Provided

What do you feel additional data needs might be:

No Response Provided

McKenzie County, ND – Odin Hein

Primary species of concern.

"LEAFY SPURGE-HARD TO CONTROL AND SCATTERED THROUGHOUT AREA SALT CEDAR-HARD TO LOCATE AND SCATTERED UP AND DOWN THE YELLOWSTONE, MISSOURI RIVERS STAR THISTLE-NOT IN OUR COUNTY YET BUT HEADED THIS WAY.(PROBABLY WITH HAY HAULING)KNAPWEEDS-SCATTERED THROUGHOUT OUR COUNTY, NOT OUT OF CONTROL YET. (HAY HAULING)"

Comments or concerns relating to the CES.

No Response Provided

How are you addressing invasive species in your county

No Response Provided

What do you feel additional data needs might be:

No Response Provided

Bureau of Land Management – Billings Field Office, Larry Padden

Comments or concerns relating to the CES.

"Overall, an excellent compilation of existing informastion and data !! Well done !! A couple of comments though:

Pg. 107, Herbicide control; no mention of "Plateau"? I know that it is not approved on BLM lands yet mostly because it is still in the experimental stages, among other things. However, there are some very promising test results that can't be overlooked. Just wondering.

Pg. 109-111, Exisiting GIS inventory data; Would it be adventageous to include a brief "Future Needs" section ?
Also, perhaps a short section on how the Yellowstone data will/can/should dovetail with other like studies.
Perhaps a brief description or vision on how (or if) there is a connection to the Statewide Plan, just released in draft form. Even if this is outside the scope of this document/study, it might be worth mentioning.

That's it from me !

Excellent work!!"

Bureau of Land Management, Mile City Field Office – Brenda Witkowski

How are you addressing invasive species in your agency

"The BLM is using an integrated approach in treating noxious weeds. We are using chemical, biological, both sheep and bugs, mechanical and prescribed fire. "

What do you feel additional data needs might be:
"The BLM helicopter survey has been a huge asset to Eastern Montana counties in assessing the noxious weed problems we have through out our area."

Data Gaps and Analysis

Introduction

During the course of reviewing the existing inventory information of the invasive plant communities, it became very evident that limited historical data exists. In an effort to more clearly determine the scope of informational gaps, along with validating the usability of the accumulated inventory information, analysis of the data was necessary. The geospatial inventory information that is contained in the information summary provides some insight into the current infestation status of certain portions of the river corridor. Comparison of the data with field observations revealed that the methods used to acquire much of the information did not allow for the accuracy that is needed to clearly depict the scope of the invasive plant problem. Although much of the data is reasonably current (2000-2001), establishing a consistent relationship between the point - based GPS data and acres of infestation was difficult to ascertain. The intent of the invasive plant studies was to generate additional information in a format that could be utilized to relate to subsequent ecological information for ecological assessment purposes. In the following two sections, examples are given to clarify these data gaps, and provide some justification as to the need for the additional proposed study tasks that were determined to be needed.

Invasive Study Scope #2

This task objective is to produce GIS data to be used in determining the spread of Salt Cedar on the Yellowstone River. Salt Cedar inventories were completed in 1999, 2000, and 2001 during a cooperative project funded by the Bureau of Land Management. This inventory began at the Big Horn River and progressed to the confluence with the Missouri. This older spatial data would be used as an underlay to potentially determine spread and rate of spread.

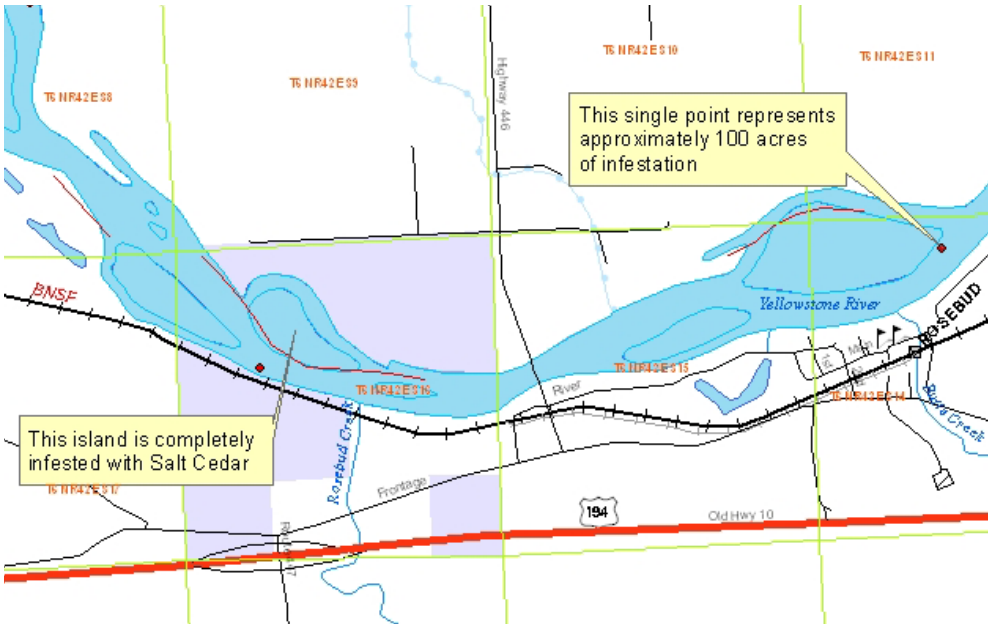
Additionally control efforts conducted to date could be evaluated for success of suppression. By utilizing data from the other scopes of work, it might also be possible to determine stream bank change resulting from removal and restoration of native plant communities due to removal of the Salt Cedar.

Deliverables:

1. Spatial data representing the Salt Cedar location and density projected to match the 2000 NRCS CIR base layer.
2. Technical report detailing the status of the Salt Cedar infestation on the Yellowstone River

As mentioned above the most relevant data to this study scope would be that collected during the 2000-2001 aerial inventories. The most obvious data gap would be the fact this survey was only conducted from the confluence with the Big Horn River to the confluence with the Missouri river. This omits the upper half of the river from Gardiner to the confluence with the Big Horn.

Additionally based on field observations, made during a spray project conducted by the Lower Yellowstone River Working Group, the aerial data on the completed section is either incomplete or the infestation has multiplied by an order approximate to 100 times. The figure depicts and example of this. This map can also be found on page 17 of the Cooperative Aerial Inventory Atlas section of this document.



These two examples can be replicated at literally hundreds of locations along the Yellowstone River beginning in the Pompey's Pillar area to the confluence with the Missouri. This factor alone can determine the need to leave study task #2 intact. In addition, however, there is no quantifiable salt cedar inventory information for the Yellowstone River in Park, Sweet Grass, Stillwater or Carbon Counties.

Invasive Study Scope #3

Ground based data collection will be use in this task to collect the more detailed data about invasive species (height, density, etc.). Additional Invasive plant data, including but not necessarily limited to the list in Appendix A, will be collected at this time. The selected representative reaches, as determined by the geomorphology scope, will be used to create a representative cross section. A 2-½ mile subset area will be established in each of the selected reaches. Each sub reach will be ground inventoried using GPS to collect spatial data and permanent photo points for ongoing monitoring. This will create several baseline locations to monitor future spread or the success of control measures.

Additionally non-selected sub reaches that include major tributaries have been added. These will be used to determine if the tributaries are a contributing factor to invasive species infestation on the Yellowstone River. A 2 ½ mile long area will be set up using the tributary as the center point moving 1 ¼ miles both up and down river. These include:

Boulder River – A4, A5
Big Horn River – B12, C1
Tongue River – C17
Powder River – C21, D1

Inventory of these areas will be dependant upon permission to access private lands. If this permission contact has not yet been performed by the Conservation Districts permission will be sought as part of this task.

Due to possible limitations of available resources (funding, time, etc) it may not being practical to cover all 37 of the subset area efforts will be concentrated on the tributary confluence areas first. Any additional prioritized subsets for field data acquisition will be determined based on those selected by the avian and riparian scopes of work. This will allow for the greatest benefit of comparative analysis between studies.

Deliverables:

1. Spatial data representing the invasive plane location and density projected to match the 2000 NRCS CIR base layer.
2. Photo point data and permanent location information delivered to local managers

Although similar to the inventory conducted by the Yellowstone County Weed Department in 2002-2003 study task #3 is meant to be far more detailed. They 2002-2003 inventory information depicts a location and an estimation of the infested acreage. In study, task #3 the intent is to be far more precise by actually measuring the acreages and performing stand counts of the plants in these infested areas. This will allow for a far more detailed dataset for use in determining rate of spread and effectiveness of control methods in the future.

However, due to the fact that the project area for the 2002-2003 Yellowstone County Project overlaps selected study reaches, A16, A17, A18, B1, B2, B3, B4, B5, B6, B7, and B8. This should allow for making some assessment as to an increasing or declining trend in the infestations

Appendix A – Montana and North Dakota Invasive Species Reference Guide

Canada Thistle
(Cirsium arvense)

Peggy Greb, USDA ARS

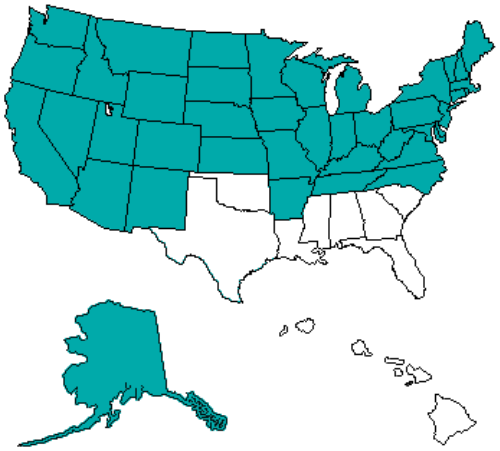
Norman E. Rees, USDA ARS

Dan Tenaglia, http://www.missouriplants.com/

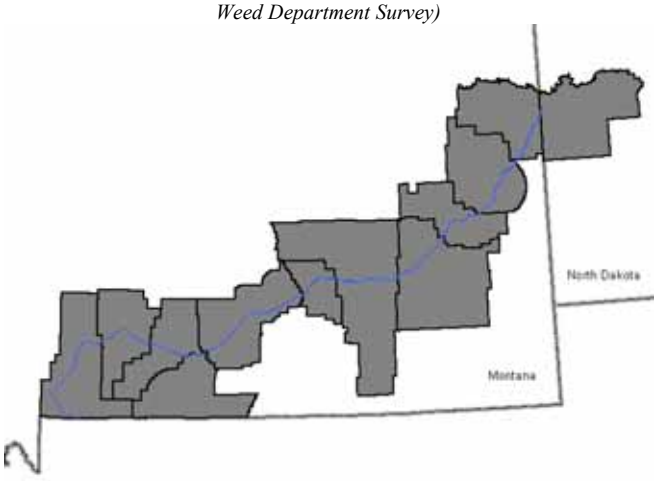
Alec McClay, McClay Ecoscience

Photos From Montana State University Archives, Montana State University, www.invasive.org

United States Distribution
(Noxious and Nuisance Plant Information System U.S. AcoE)



Study reach counties with known infestations
(2004 Montana Noxious Weed Mapping System Section Based Mapping Data & Local Weed Department Survey)



Canada Thistle *(Cirsium arvense)*

Status:	State listed weed in Montana, and North Dakota

History:

First Montana Specimen Collected [1]

County: Musselshell **Year:** 1881

"Canada thistle is a native or Eurasia and was probably introduced to America around 1750. Canada thistle was first described in taxonomic texts in 1753 under the Latin name Serratula arvensis L. The first state to enact noxious weed legislation against Canada thistle was Vermont in 1795 followed by New York in 1831 [147]" (Wilson, 2). The first recorded infestation in Montana was collected in Musselshell County in 1881.

County	Year First Specimen Recorded [1]
Park	1941
Sweet Grass	1948
Stillwater	1910
Carbon	1991
Yellowstone	1956
Treasure	1989
Rosebud	1989
Custer	1989
Prairie	1989
Dawson	N/A
Richland	N/A
McKenzie	N/A

Habitat:	*"Canada thistle is adaptable to a wide range of habitats. It occurs in nearly every upland herbaceous community within its range, particularly prairie communities and riparian habitats [162]. It is most commonly found in disturbed areas as part of the initial post disturbance community along roadsides, railroads, stream banks, ditches, lakeshores, seashores, sand dunes and other open sandy areas,[153] in clear cuts and forest openings, and in wet and wet-mesic grasslands and prairie potholes."* (Zouhar, 3)
Growth Habit:	Perennial, erect, up to 4 ft. tall.
Leaves:	Varies from light to dark green, oblong or lance shaped, deeply cut, spiny toothed margins (some may be smooth slightly hairy below. Tremendous leaf variability.
Stem:	Smooth to slightly hairy, branched top.
Flower:	Small bristly clusters, 3/8 to 5/8 inch in diameter, light lavender to deep rose purple Plants are male or female.
Roots:	Extensive, fleshy, creeping rootstocks.
Seeds:	Smooth, light to dark brown, tipped by a cupped conical point, approx. 1/8" long.
Other Notes:	Reproduces by seed and creeping rootstocks.

Field Bindweed
(Convolvulus arvensis)

Dave Powell, USDA Forest Service

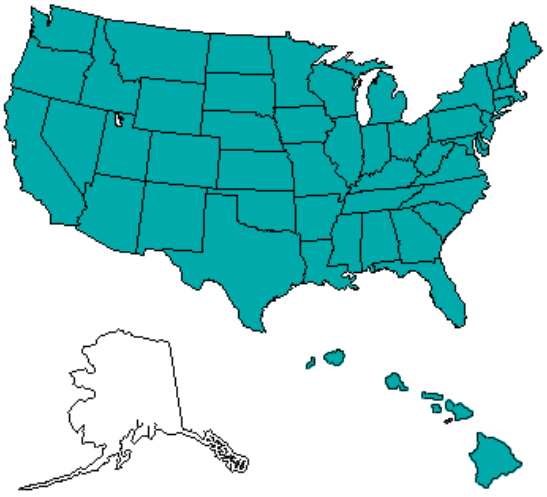
Norman E. Rees, USDA ARS

John D. Byrd, Mississippi State University

Photos From Montana State University Archives, Montana State University, www.invasive.org

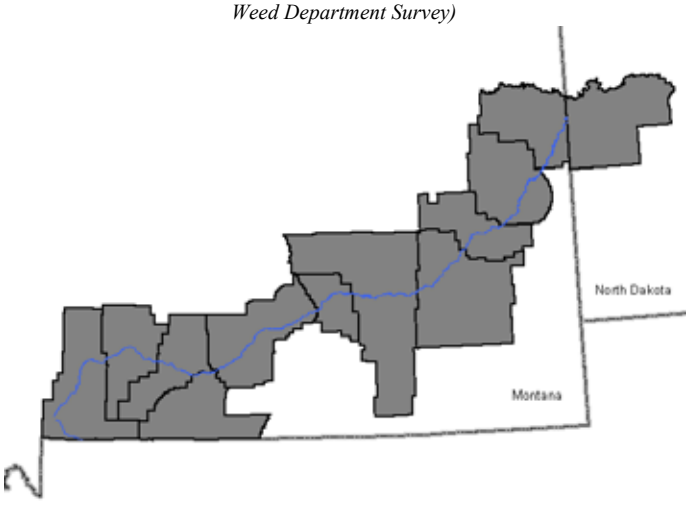
United States Distribution

(Noxious and Nuisance Plant Information System U.S. AcoE)



Study reach counties with known infestations

(2004 Montana Noxious Weed Mapping System Section Based Mapping Data & Local Weed Department Survey)



Field Bindweed *(Convolvulus arvensis)*

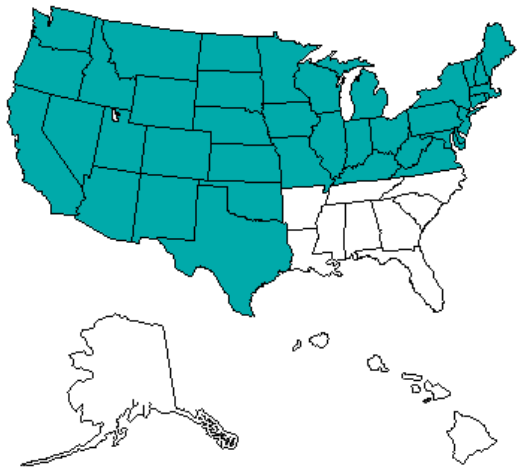
Listing Status:	State listed noxious weed in both Montana and North Dakota
History:	**First Montana Specimen Collected** [1] **County:** Missoula **Year:** 1891 *"Field bindweed was introduced to eastern North America from Europe and Asia in the 18th Century. It rapidly spread westward and is now found throughout the United States."* (Weaver, & Riley, 4)
Habitat:	Plants grow in cultivated fields, waste areas, and often in the edges of forests.
Growth Habit:	Perennial vine, reproducing from seeds and roots
Leaves:	Alternate, simple, arrowhead-shaped, rounded or blunt tipped.
Stem:	Prostrate, twining and mat-forming, up to 10 ft. long
Flower:	Funnel-shaped, pale pink to white, up to 1 in. wide; two small scale-like bracts attached below flower on flower stem.
Roots:	Creeping rhizomes, extensive
Seeds:	Four per capsule, dark gray to reddish brown, three sided.
Other Notes:	*"Field bindweed is a hardy perennial found throughout Montana. It spreads from an extensive rootstock as well as from seed. Most parts of the bindweed roots and rhizomes can produce adventitious buds, which can create new roots and shoots. Roots capable of budding are found to depths of 14 feet. Fragments of vertical roots and rhizomes that are as short as 2 inches can form new plants. Lateral roots serve another important function. At about 15 to 30 inches from the parent plant, a lateral often turns downward, becoming a secondary vertical root, and sends out both roots and shoots from the turning point. By this means a single field, bindweed plant can spread radially more than 10 feet in a growing season. This extensive underground network allows for overwintering without foliage, and it can persist for many years in the soil."* (Unknown, 5) *"One to four dark brown seeds are produced in round, smooth, 1/4-inch capsules. An average plant produces about 550 seeds. Within 1 month after forming, the seed coat matures and becomes impervious to water. Seed that is 60 years old has been found to be alive, and the seed are commonly found in the soil seed bank. Once the seed coat is weakened, seed will germinate at temperatures of 41° to 104°F."* (Unknown, 5) *"Drought tolerance is a characteristic of field bindweed. When water is withheld, bindweed competes better than most other plants. If an area is well watered, ornamentals may compete better than the bindweed. In the landscape, field bindweed will survive with sprinkler or drip irrigation. If there is no summer water, the plant reduces its seed production first and then reduces growth and leaf size, but some flowers and seed are still produced. Seeds are viable over 60 years. Often confused with wild buckwheat which has heart-shaped sharp pointed leaves and tiny inconspicuous flowers."* (Unknown, 5)

County	Year First Specimen Recorded [1]
Park	1956
Sweet Grass	1989
Stillwater	1989
Carbon	1937
Yellowstone	1933
Treasure	1989
Rosebud	1989
Custer	1989
Prairie	1934
Dawson	1989
Richland	
McKenzie	

Whitetop or Hoary Cress
(*Cardaria draba)*

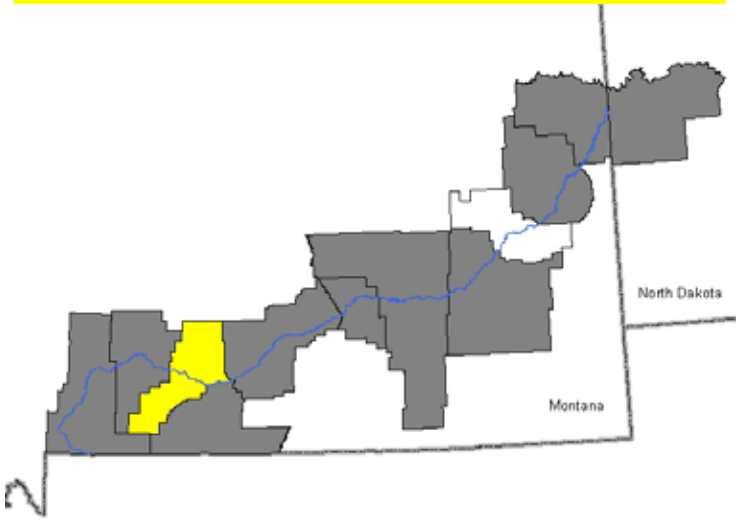
Photos From Montana State University Archives, Montana State University, www.invasive.org

United States Distribution
(Noxious and Nuisance Plant Information System U.S. AcoE)



Study reach counties with known infestations
(2004 Montana Noxious Weed Mapping System Section Based Mapping Data & Local Weed Department Survey)

Yellow Indicates Counties That Provided No Information



Whitetop or Hoary Cress (*Cardaria draba)*

Listing Status:	List noxious weed in Montana	
History:	**First Montana Specimen Collected** [1] **County:** Gallatin **Year:** 1936 *"These plants are native to the Middle East and the former USSR. The weed seeds were probably brought to this country with contaminated alfalfa seed. Whitetop was first identified in Gallatin County in 1916. It now infests about 32,000 acres across the state."* (Elpel, 6)	**County** / **Year First Specimen Recorded** [1] Park 1954 Sweet Grass Stillwater 1957 Carbon Yellowstone 2000 Treasure Rosebud Custer Prairie Dawson Richland McKenzie
Habitat:		
Growth Habit:	Perennial herb, up to 24" tall, erect, becoming lodged with age.	
Leaves:	Alternate, lance-shaped and slightly irregular, grayish-green, base of upper leaves clasping stem	
Stem:	Stoutish, branched toward top.	
Flower:	Small, white, 4 petals; numerous flower branches and dense flowers give plant a dense, white, flat-topped appearance.	
Roots:	Extensive horizontally and vertically, frequent shoots arising from root stocks.	
Seeds:	Reddish-brown, granular, egg-shaped, contained in heart-shaped pods.	
Other Notes:	*"It is a creeping perennial, which reproduces by seed and creeping roots. The extensive root system spreads horizontally and vertically with frequent shoots arising from the rootstock. It grows erect from 10 to 18 inches high and has a white color. The alternate leaves clasp the stem and are oval or oblong with toothed or almost smooth margins. The leaves are often covered with very fine white hairs. Each leaf is 1/2 to 2 inches long with blunt ends. The flowers are white, 1/8 inch across, and numerous in compact flattop clusters which give the plant its name. Each heart-shaped seedpod contains two oval, finely pitted, red-brown seeds each about 1/12 inch long."* (CWMA, 7) *"Hoary cress is one of the earliest perennial weeds to emerge in the spring. Flowers are produced in late April and May. It grows in waste places, cultivated fields, and pastures, and is capable of vigorous grow on the irrigated, alkaline soils of the West."* (CWMA, 7)	

Leafy Spurge
(Euphorbia esula L.)

William M. Ciesla, Forest Health Management International

William M. Ciesla, Forest Health Management International

USDA APHIS Archives, USDA APHIS

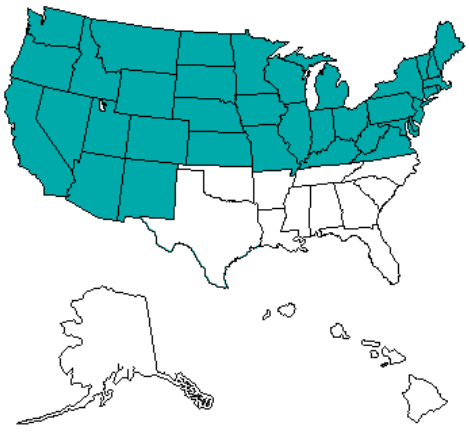
Norman E. Rees, USDA ARS

Norman E. Rees, USDA ARS

Photos From Montana State University Archives, Montana State University, www.invasive.org

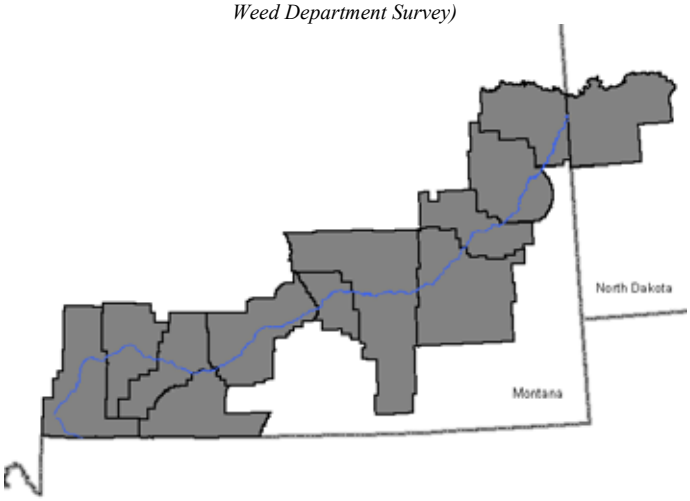
United States Distribution

(Noxious and Nuisance Plant Information System U.S. AcoE)



Study reach counties with known infestations

(2004 Montana Noxious Weed Mapping System Section Based Mapping Data & Local Weed Department Survey)



Leafy Spurge *(Euphorbia escula L.)*

Listing Status:	Listed Noxious Weed In Montana & North Dakota

History:

First Montana Specimen Collected [1]

County: Missoula **Year:** 1923

"If you have seen a Poinsettia at Christmas time then you have met a close relative of leafy spurge. The colorful bracts are common in the spurge family and may be mistaken for sepals or petals. Worldwide there are about 1600 species of Euphorbia" (Elpel,.8)

"Leafy Spurge (Euphorbia escula) was first introduced into eastern North America from Russia in the early 1800s. Other introductions were made in the Midwest later in the century, probably as contaminants in seed grain. Some researchers believe our leafy spurge is a hybrid of two or more Old World species. Today the plant covers more than 1.1 million hectares (about 2.7 million acres), mostly in Montana, North Dakota, South Dakota, Nebraska and Wyoming." (Elpel, 8)

County	Year First Specimen Recorded [1]
Park	1924
Sweet Grass	1940
Stillwater	1940
Carbon	1953
Yellowstone	1966
Treasure	1978
Rosebud	1959
Custer	1973
Prairie	1963
Dawson	1989
Richland	1932
McKenzie	

Growth Habit:	Perennial, erect, up to 3' tall, spreading by seed or creeping roots.
Leaves:	Alternate, long, narrow, 1/4" wide and 2" long, usually drooping.
Stem:	Branched near top, hairless, entire plant contains milky sap.
Flower:	Inconspicuous, surrounded by large heart shaped floral leaves, which turn yellow-green, near maturity.
Roots:	Brown, numerous pink buds, deep, spreading, and very persistent.
Seeds:	Seed is thrown to 20' by exploding seed capsule.

Other Notes:

"Leafy spurge can reduce grass production by 75% in infested fields. The perennial plant spreads by seeds and roots. The deep and extensive root system makes the plant resistant to grazing, cultivation, and herbicides." (CWMA, 7)

"Pulling or plowing the plant may stimulate the roots to spread even more. A root fragments as small as 1/2" can grow into a new plant. Herbicides will kill the vegetation and roots near the soil surface, but they do not translocate to the deeper roots. The roots can extend thirty feet down into the soil, and new shoots will sprout up from almost any depth. Several repeat chemical applications may be required to kill the entire plant and root system." (CWMA, 7)

Russian Knapweed
(Centaurea repens)

Eric Coombs, Oregon Department of Agriculture

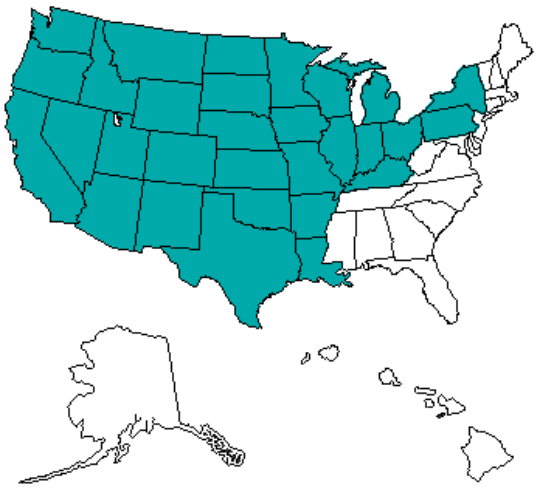
Norman E. Rees, USDA ARS

Norman E. Rees, USDA ARS

Photos From Montana State University Archives, Montana State University, www.invasive.org

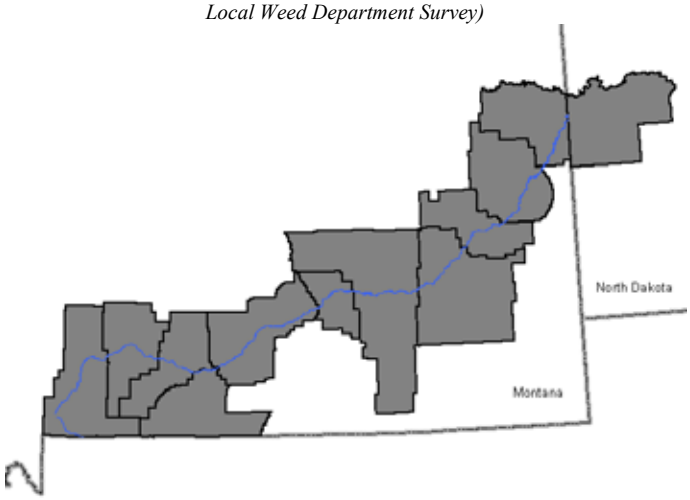
United States Distribution

(Noxious and Nuisance Plant Information System U.S. AcoE)



Study reach counties with known infestations

(2004 Montana Noxious Weed Mapping System Section Based Mapping Data & Local Weed Department Survey)



Russian Knapweed *(Centaurea repens)*

Listing Status:	Listed Noxious Weed In Montana & North Dakota

History:

First Montana Specimen Collected [1]

County: Fergus **Year:** 1934

"Russian knapweed is native to Mongolia, Russian Turkistan, Iran, Turkish Armenia and Asia Minor. Seeds of Russian knapweed were present in alfalfa seed imported from Russian Turkistan beginning in 1898 and 1899. An estimated 500,000 acres were planted with commercial Turkistan alfalfa in the United States. Once imported, it spread widely by sale of domestically produced alfalfa seed or hay containing weed seeds. It was first reported in the Northwest in Yakima County, Washington in 1922 and in Fergus County, Montana in 1934. By 1991, the weed was recorded in every county in Montana and infests an estimated 51,000 acres." (Duncan, Story, & Sheley, 9)

County	Year First Specimen Recorded [1]
Park	1965
Sweet Grass	1989
Stillwater	1989
Carbon	1991
Yellowstone	1965
Treasure	1989
Rosebud	1977
Custer	1981
Prairie	1989
Dawson	1989
Richland	1975
McKenzie	

Growth Habit:	Perennial herb, up to 3 ft. tall, erect, may be in dense clumps.
Leaves:	Alternate, simple, of several types: Upper leaves -- small, narrow, unbroken edge; Stem leaves -- intermediate in size, slight toothed margins; Basal leaves -- deeply notched.
Stem:	Numerous branched, each ending with a single flower.
Flower:	Single, terminal, lavender, thistle like, scaly seed head.
Roots:	Dark brown to black and heavily scaled.
Seeds:	Flattened, ivory colored, retained in cup shaped seed heads.

Other Notes:

"Although Russian knapweed is closely related to the spotted and diffuse knapweeds, there are some distinct differences too, enough differences that it is sometimes considered a different genus, Acroptilon repens. Instead of emphasizing mass seed production like the other knapweeds, Russian knapweed puts much of its energy into a deep and spreading root system. New plants shoot up from the roots, forming dense patches of cloned plants. Thus the plant is slower to establish, but more difficult to eradicate than the other knapweeds. The plants are long-lived perennials, known to live more than 75 years. It favors poorly drained and alkaline/saline soils, but does not do well in dense shade or severe drought. Russian knapweed infests about 47,000 acres of rangeland in Montana.

Russian knapweed contains sesquiterpene lactones, which can cause irreversible brain damage in horses, a disorder called "chewing disease" (equine nigropallidal encephalomalacia). Affected horses are unable to chew or use their lips normally; It is also characterized by yawning, standing with the head down, aimless walking, head pressing, and difficulty breathing. The disease has occurred in horses that consumed more than 60% of their body weight of the weed within 1-2 months. There is no known cure, and death results from starvation or dehydration. The plants are toxic wet or dried. Horses only graze on Russian knapweed if no other forage is available, or if it is included in hay." (Elpel, 10)

Spotted Knapweed
(Centaurea maculosa)

Cindy Roche,

University of Idaho Archives, University of Idaho

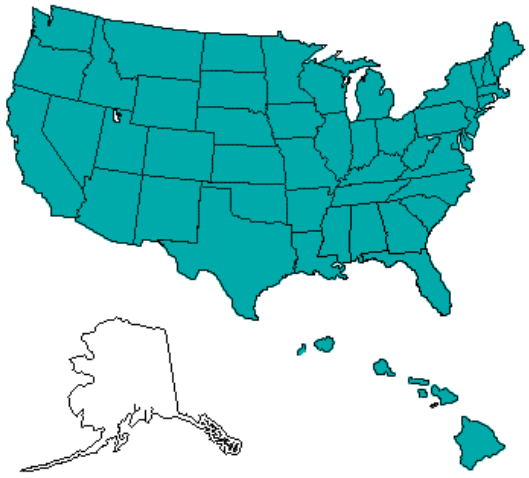
University of Idaho Archives, University of Idaho

Norman E. Rees, USDA ARS

Photos From Montana State University Archives, Montana State University, www.invasive.org

United States Distribution

(Noxious and Nuisance Plant Information System U.S. AcoE)



Study reach counties with known infestations

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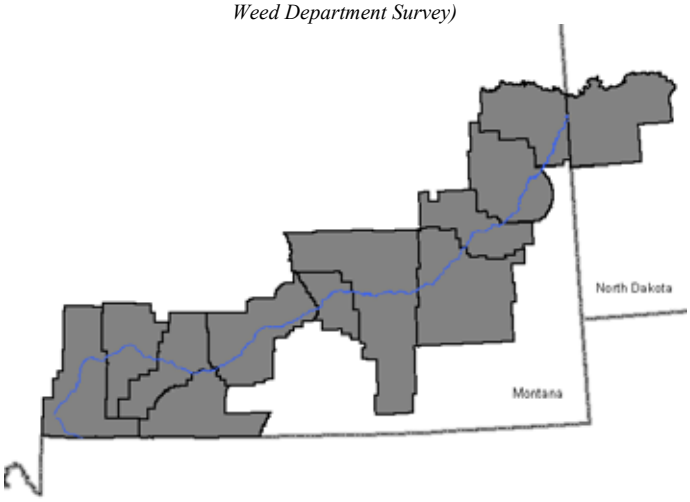


Spotted Knapweed *(Centaurea maculosa)*

Listing Status:	Listed Noxious Weed In Montana & North Dakota

History:

First Montana Specimen Collected [1]

County: Ravalli **Year:** 1920

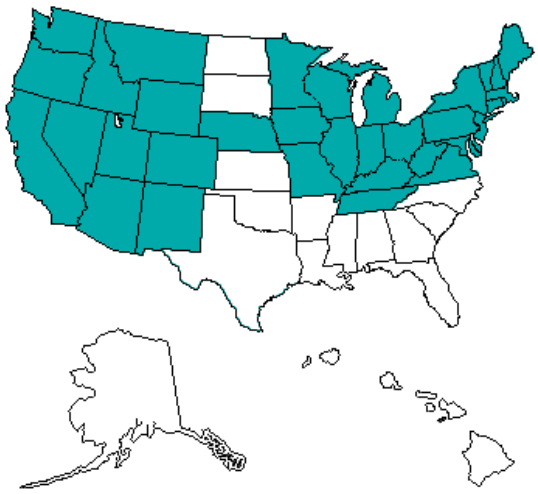
"A native of Europe, C. maculosa was accidentally introduced to North America most likely in the 1890s in alfalfa seed from Asia Minor (Maddox 1979).
Spotted knapweed was collected in Victoria, B.C. in 1893 (Moore and Frankton 1974). It is assumed that soil carried on ships as ballast and unloaded in the port transported knapweed seed to this site at that time (Roche et al. 1986). Although the earliest collections of C. maculosa are from coastal areas of British Columbia and Washington, evidence of observed densities and directions of spread suggest it has moved into Washington more rapidly from the east (Roche et al. 1986). This species was abundant in Montana before it became common in Washington (Roche et al 1986)." (Mauer, Russo & Evans, 11)

County	Year First Specimen Recorded [1]
Park	1961
Sweet Grass	1989
Stillwater	1966
Carbon	1953
Yellowstone	1989
Treasure	1989
Rosebud	1984
Custer	1989
Prairie	1989
Dawson	1989
Richland	1989
McKenzie	

Growth Habit:	
Leaves:	Alternate, simple, of several types: Upper leaves -- small, narrow, unbroken edge; Stem leaves -- intermediate in size, slight toothed margins; Basal leaves -- deeply notched.
Stem:	Slender Stems usually having many branches.
Flower:	Pink-purplish flower, also sometimes light purple or white. The flow heads bracts are colored have dark colored streaks giving the head a "spotted" appearance.
Roots:	
Seeds:	Prolific seed producer. Can produce 1000 or more seed per plant with a viability of more than eight years.
Other Notes:	*"It is not known how often livestock and wildlife eat knapweed seed heads. However, tests indicated that 11% of the seeds eaten by mule deer and 4% of the seeds eaten by sheep, pass through their digestive systems, with a viability of up to 22%. Viability was near zero for seeds that took longer than two days to pass. The experiments were carried out by feeding mule deer and sheep capsules of spotted knapweed seeds.* *Spotted knapweed has a reputation for exuding a poison that kills other plants nearby. Infested lands may consist of nothing but acres and acres of knapweed with seemingly lifeless soil beneath it.*" (Elpel, [12])

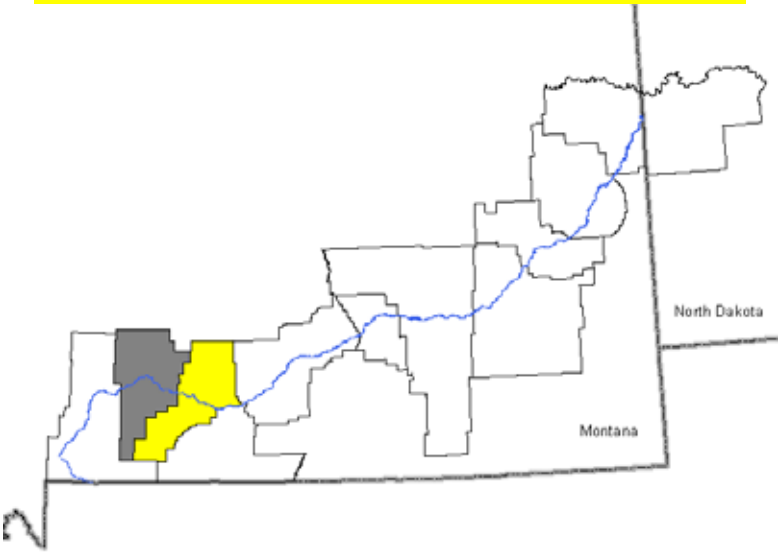
Diffuse Knapweed
(Centaurea diffusa)

United States Distribution
(Noxious and Nuisance Plant Information System U.S. AcoE)



Study reach counties with known infestations
(2004 Montana Noxious Weed Mapping System Section Based Mapping Data & Local Weed Department Survey)

Yellow Indicates Counties That Provided No Information



Diffuse Knapweed *(Centaurea diffusa)*

Listing Status:	Listed Noxious Weed in Montana & North Dakota
History:	**First Montana Specimen Collected** [1] **County:** Mineral **Year:** 1951 *"Diffuse knapweed was first reported in Washington state in 1907. Today the plant has spread to more than 3.21 million acres across Washington, Idaho, Oregon, Montana, and British Columbia."* (Elpel, 13)

County	Year First Specimen Recorded [1]
Park	
Sweet Grass	1952
Stillwater	1991
Carbon	
Yellowstone	1989
Treasure	1989
Rosebud	
Custer	
Prairie	
Dawson	
Richland	
McKenzie	

Growth Habit:	Annual or biennial, bushy, up to 2 ft. tall. Rosette formed first year, flowering stalk elongates second year.
Leaves:	Grayish-green, alternate, basal leaves whorled, upper leaves much reduced. Covered with fine hair.
Stem:	Hairy, erect, single main stem from a rootstock, branched near or above the base.
Flower:	Solitary, usually white, sometimes pink, rose or lavender; seed head bracts end as sharp, rigid spines.
Roots:	Elongated taproot.
Seeds:	Oblong, dark brown or gray with longitudinal lines.
Other Notes:	*"Diffuse knapweed is a tap-rooted annual, biennial or short-lived perennial forb that reproduces by seed. Plants over winter as a rosette that resembles spotted knapweed. Plants usually produce a single main stem that divides into numerous branches about halfway up the stem, giving it a ball-shaped, tumbleweed appearance and mobility. A single flower head is at the end of each branch. Flowers are usually white, but can range to light purple. Bloom period is usually from mid-July through September.* *Bracts on diffuse knapweed have a rigid terminal spine about one-quarter to one-third of an inch long with four to five pairs of shorter lateral spines. Bracts can have dark-colored tips but lack the dark fringe present on spotted knapweed.* *Diffuse knapweed spreads mainly by wind. Mature plants break off at ground level and tumble in the wind or become attached to the undercarriage of vehicles and equipment."* (Duncan, Story & Sheley, 9)

Dalmation Toadflax
(Linaria dalmatica)

Bob Nowierski, Montana State University

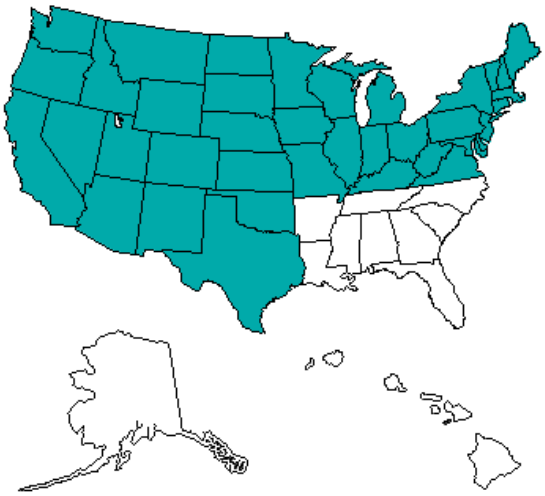
Bob Nowierski, Montana State University

Bob Nowierski, Montana State University

Photos From Montana State University Archives, Montana State University, www.invasive.org

United States Distribution

(Noxious and Nuisance Plant Information System U.S. AcoE)



Study reach counties with known infestations

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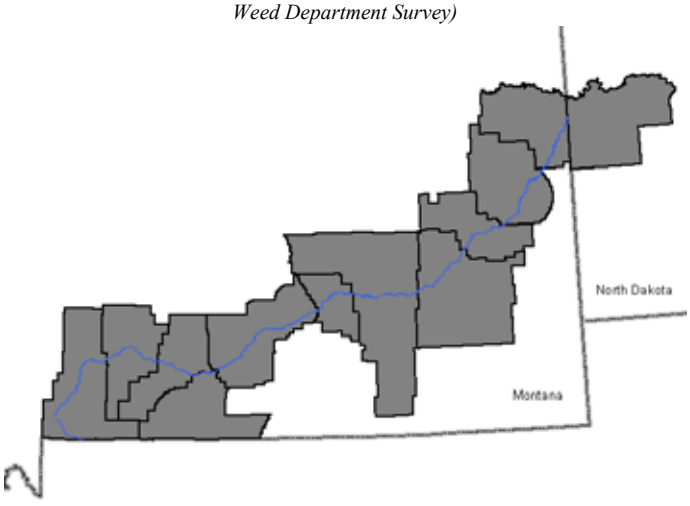

Dalmation Toadflax *(Linaria dalmatica)*

Listing Status:	Listed Noxious Weed In Montana & North Dakota

History:

First Montana Specimen Collected [1]

County: Gallatin **Year:** 1952

"Dalmation Toadflax is native to the Mediterranean region of Europe. The plant was introduced to the western U.S. as an ornamental about 1874. The leafy plants of some toadflax species look much like the unrelated flax plants, and the flowers somewhat resemble toads, hence the name "toadflax".

The toadflaxes first appeared in Montana in the 1940's, and they have become widespread since then." (Elpel, 14)

County	Year First Specimen Recorded [1]
Park	1987
Sweet Grass	1989
Stillwater	1991
Carbon	1955
Yellowstone	1984
Treasure	
Rosebud	1991
Custer	
Prairie	1989
Dawson	1989
Richland	1989
McKenzie	

Growth Habit:	Perennial, often over 3 ft. tall, erect.
Leaves:	Light green, alternate, broad, heart shaped, clasping the stem.
Stem:	Branching, light green, smooth and leafy.
Flower:	Snapdragon type, bright yellow, tinged with orange, to 1/2" long spur, born in upper leaf axils.
Roots:	Vigorous, deep and extensive, creeping roots.
Seeds:	Numerous, irregularly angled.
Other Notes:	*"Like many other noxious weeds, toadflax thrives in dry, exposed soils on rangeland or along roads. Toadflax seedlings are poor competitors for soil moisture, but once established the plants develop a vigorous spreading root system. New plants develop from the root buds or from seeds. A single plant can produce a half million seeds. The plants live for about five years and the seeds remain viable in the soil for up to ten years".* (Elpel, 14)

St. Johnswort
(Hypericum perforatum)

Norman E. Rees, USDA ARS

Carol DiSalvo, National Park Service

Eric Coombs, Oregon Department of Agriculture

Norman E. Rees, USDA ARS

Photos From Montana State University Archives, Montana State University, www.invasive.org

United States Distribution

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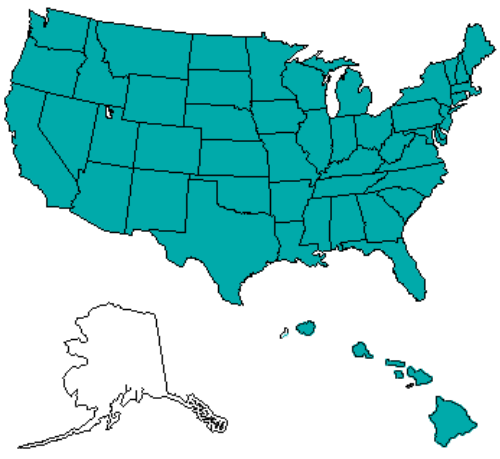

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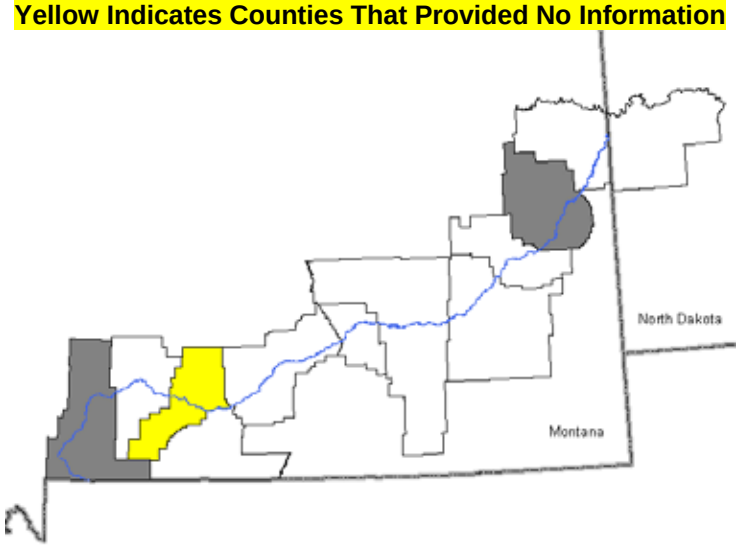

St. Johnswort *(Hypericum perforatum)*

Listing Status:	Listed Noxious Weed In Montana & North Dakota

History:

First Montana Specimen Collected [1]

County: Gallatin **Year:** 1905

"Worldwide there are about 350 species of Hypericum including 25 species in North America. St. Johnswort (Hypericum perforatum), also known as klamath weed or goat weed, was introduced to this country in 1696 for it's medicinal, ornamental, and "magical" properties. Today the plant is found in most states, with 500,000 acres just in Montana." (Elpel, 15)

County	Year First Specimen Recorded [1]
Park	1989
Sweet Grass	1963
Stillwater	1998
Carbon	
Yellowstone	
Treasure	1989
Rosebud	
Custer	
Prairie	
Dawson	1989
Richland	
McKenzie	

Growth Habit:	Perennial, erect, numerous branches.
Leaves:	Opposite, attached directly to stem, 1 inch long, oblong, covered with transparent dots.
Stem:	Woody at the base, 1 to 3 ft. tall, rust colored, with 2 ridges.
Flower:	Yellow, 3/4-inch diameter, in fiat-topped clusters, 5 petals with numerous stamens.
Roots:	Branched and deep, some shallow capable of sending up shoots.
Seeds:	Small, shiny black, with rough texture in a round, pointed, three-part seed pod.

Other Notes:

"If you've been troubled by depression then you may be delighted to learn about St. Johnswort. St. Johnswort has become a well-known and effective herbal alternative to Prozac and other anti-depressants. These are perennial herbs with simple, opposite leaves. The leaves are often covered with dark glands or clear dots. Flower petals are usually yellow, but may be tinged with red or orange spots. At least one species has pink blossoms. The flowers are regular and bisexual with 4-5 sepals, 4-5 petals, and 10 or more stamens.

It is reported to be "cyclic" with significant population swings from year to year. St. Johnswort is a perennial plant with a horizontal spreading root system. It reproduces by both seeds and runners. A single plant may generate 15,000 to 30,000 seeds per year. Seeds remain viable in the soil for up to 10 years. Seed germination is inhibited during hot dry summers or when buried more than 2 mm below the surface." (Elpel, 15)

Sulfur (Erect) Cinquefoil
(Potentilla recta)

USDA ARS Archives, USDA ARS

USDA ARS Archives, USDA ARS

Photos From Montana State University Archives, Montana State University, www.invasive.org

United States Distribution

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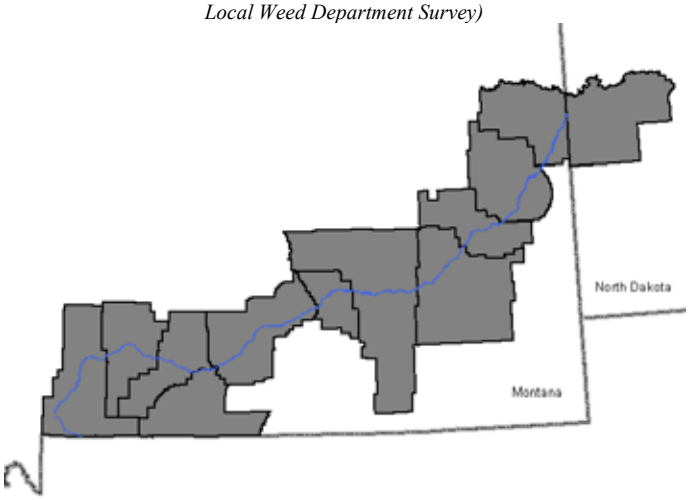

Sulfur (Erect) Cinquefoil *(Potentilla recta)*

Listing Status:	Listed Noxious Weed In Montana

History:

First Montana Specimen Collected [1]

County: Ravalli **Year:** 1947

"Sulfur cinquefoil is a perennial forb native to Eurasia. It first appeared in North America before 1900 in Ontario, Canada. By the 1950s it had become widely established in eastern Canada, the northeast United States and the Great Lakes region. The first specimen from Montana was collected in 1947 in Ravalli County. The second and third specimens recorded in Montana were from Lincoln County in 1949 and Mineral County in 1955. Identification of the species in additional counties was infrequent until the mid 1980s when an exponential expansion seems to have occurred. As of 1993, at least 30 counties were infested in Montana, 14 in Idaho, and 5 in northern Wyoming as well as Yellowstone and Glacier National Parks. Colonies that have expanded to dominate 100 to 1000 acres are not uncommon". (MSU,16)

County	Year First Specimen Recorded [1]
Park	1984
Sweet Grass	1992
Stillwater	1992
Carbon	1991
Yellowstone	1981
Treasure	
Rosebud	1994
Custer	
Prairie	
Dawson	
Richland	
McKenzie	

Growth Habit:	Erect, long-lived perennial, reproducing by seed, plant may form a ring of plants as the older center dies out and new stems grow on the outside edges.
Leaves:	Palmate compound, 7 leaflets, course stiff hair on upper and lower surfaces, yellowish green. Rather than silver as in most Potentilla spp.
Stem:	One of several, 12 to 28 inches tall, branched near top, covered with hairs. Numerous leaves along stem, few from base.
Flower:	1/2 to 1 inch in diameter, pale yellow, large yellowish green buds. May bloom late May throughout summer.
Roots:	Woody (No rhizomes)
Seeds:	Very tiny 1/20th inch in diameter, rough.
Other Notes:	*"Sulfur cinquefoil is often found in disturbed areas such as roadsides and pastures. Colonies of plants are also seen in undisturbed sites."* (CWMA, 7)

Common Tansy
(Tanacetum vulgare)

Photos From North Carolina State University

United States Distribution
(NRCS Plants Database http://plants.usda.gov)

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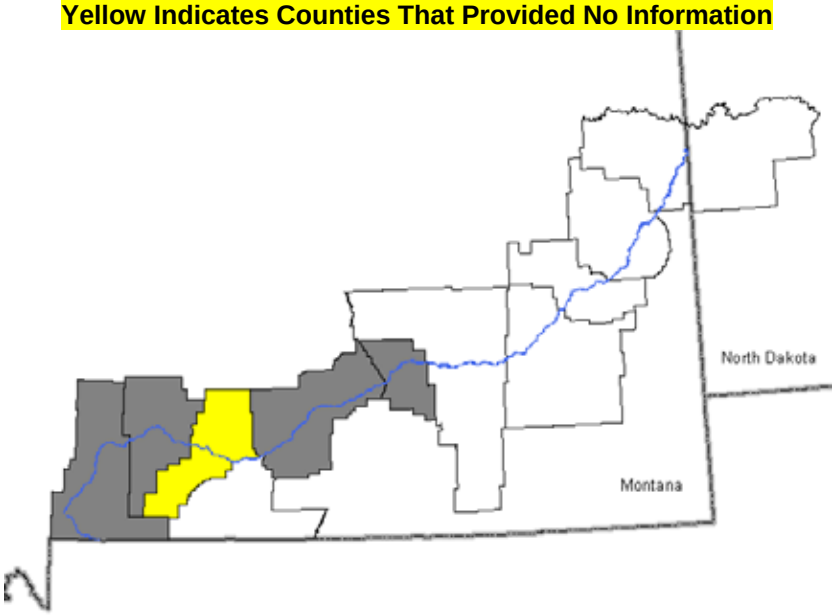


Common Tansy *(Tanacetum vulgare)*

Listing Status:	Listed Noxious Weed In Montana

History:

First Montana Specimen Collected [1]

County: Missoula **Year:** 1936

"Common tansy (Tancetum vulgare), also known as golden buttons and garden tansy, is a perennial herb in the sunflower family. This species, native to Europe, has a long history of medicinal use. It was first introduced to North America for use in folk remedies and as an ornamental plant." (LeCain & Sheley, 17)

County	Year First Specimen Recorded [1]
Park	1948
Sweet Grass	
Stillwater	
Carbon	
Yellowstone	
Treasure	
Rosebud	1981
Custer	
Prairie	1974
Dawson	1969
Richland	
McKenzie	

Growth Habit:	Perennial, erect, bushy, to 6 feet tall
Leaves:	Dark green, alternate, deeply divided into numerous narrow, toothed leaflets (fern-like).
Stem:	Often purplish-red in color.
Flower:	Yellow, button-like, without petals, ½ inch across in flat topped dense clusters.
Roots:	Reproduces from roots
Seeds:	Yellowish brown with short 5 toothed crown.

Other Notes:

"This perennial plant spreads via an extensive, spreading root system and profuse seed production. It especially favors the disturbed soils along ditch banks, where the water quickly spreads the seeds for miles downstream. Common Tansy is now widespread from coast-to-coast across most northern states and Canadian provinces. Despite extensive infestations along ditches, creeks, and roads, the plant is not yet listed as a noxious weed in many places. Most alarming, you can still buy the seed and grow more!

Common tansy is rich in volatile oils. The aromatic fresh young leaves and flowers may be used as a substitute for sage in cooking. The main volatile oil is thujone, a potent and bitter chemical often used medicinally as a wash to treat roundworm, or internally to expel worms and cause abortions. Excess consumption of thujone for medicinal purposes has caused convulsions and death. It should not be used without medical supervision. The volatile oil can be distilled from the plants and marketed." (Elpel, 18)

Ox-eye Daisy
(Chrysanthemum officinale L.)

Brother Alfred Brousseau. Courtesy of St. Mary's College of California. St. Mary's College of California.

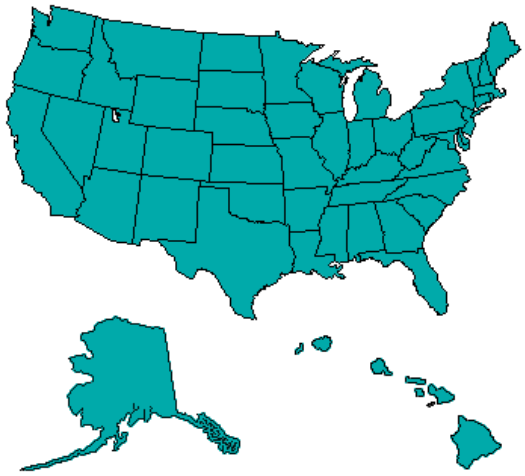
Jim Stasz.

Larry Allain. USGS NWRC

George F. Russell. Courtesy of Smithsonian Institution, Dept. of Systematic Biology, Botany

United States Distribution

(Noxious and Nuisance Plant Information System U.S. AcoE)



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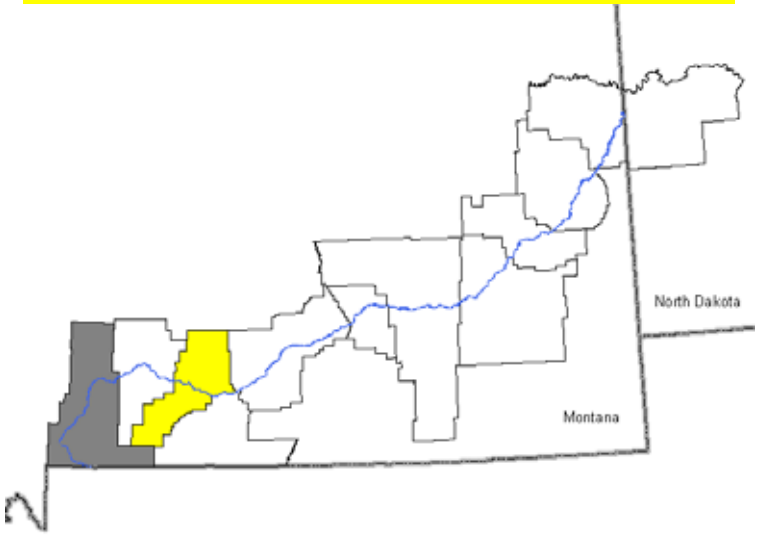


Ox-eye Daisy (Chrysanthemum officinale L.)

Listing Status:	Listed Noxious Weed In Montana	
History:	**First Montana Specimen Collected** [1] **County:** Lewis & Clark **Year:** 1890 *"The oxeye daisy is short-lived perennial originally brought here from Europe. The dainty flowers have escaped cultivation and now crowd out other plants on many rangelands. A vigorous daisy can produce 26,000 seeds per plant, while smaller specimens produce 1,300 to 4,000 seeds per plant. Tests have shown that 82% of the buried seeds remained viable after six years, and 1% was still viable after 39 years. Oxeye daisy requires cold winters to initiate blooming. The plant also reproduces vegetatively with spreading rootstalks. Daisies are resistant to many herbicides."* (Elpel, 19)	**County** / **Year First Specimen Recorded** [1] Park 1938 Sweet Grass 1954 Stillwater 1994 Carbon 1903 Yellowstone Treasure Rosebud Custer Prairie Dawson Richland McKenzie
Growth Habit:	Perennial, erect to 2 feet tall.	
Leaves:	Lower leaves – lance-shaped, 2 to 5 inches long including short stalk, margins lobed of deeply parted. Upper Leaves – lance-shaped, attached directly to stem, margins toothed	
Stem:	Numerous from root crown, terminating in flowers.	
Flower:	Solitary, 1½ inches wide, numerous white petals and a yellow center. Flowers June to August.	
Roots:	Fibrous.	
Seeds:	Straw Colored, 1/8 inch long.	
Other Notes:	*"Worldwide there are about 200 species of daisy. The oxeye daisy (Chrysanthemum leucanthemum) is a beautiful flower, one that is both loved and hated. It was a plague on pastures and crop fields across Europe. The Scots called the flowers "gools". The farmer with the most gools in their wheat field had to pay an extra tax. Now the gools have invaded this continent from coast to coast."* (Elpel, 19)	

Houndstongue
(Cynoglossum officinale L.)

John M. Randall /The Nature Conservancy

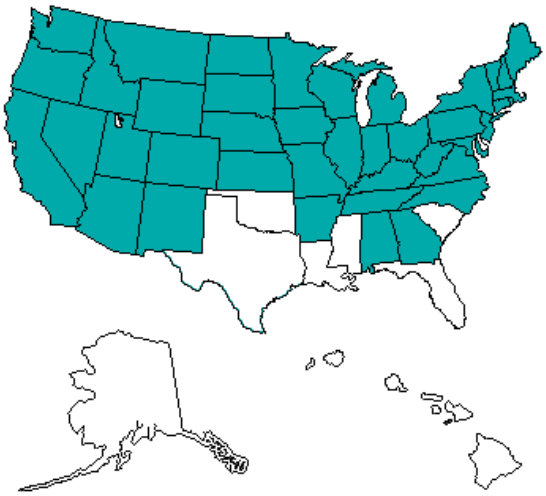
John M. Randall /The Nature Conservancy

2003 Janet Novak

W.L. Wagner. Courtesy of Smithsonian Institution, Dept. of Systematic Biology, Botany.

United States Distribution

(Noxious and Nuisance Plant Information System U.S. AcoE)



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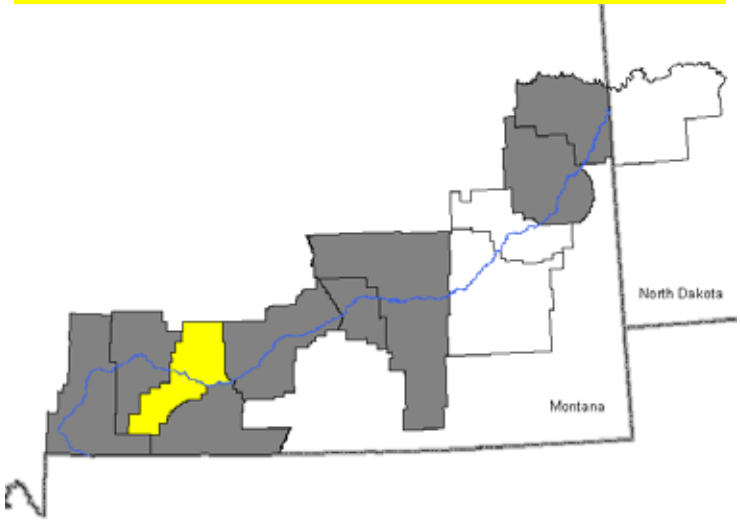


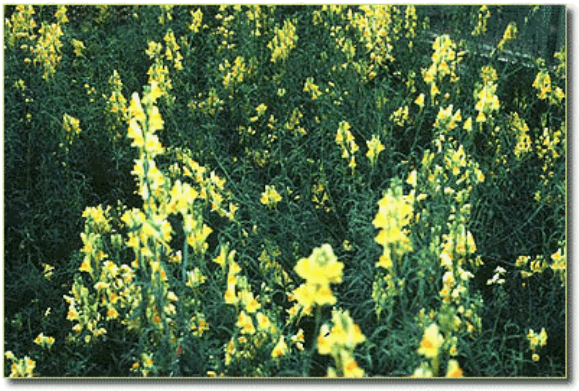
Houndstongue *(Cynoglossum officinale L.)*

Listing Status:	Listed Noxious Weed In Montana
History:	**First Montana Specimen Collected** [1] **County:** Sweet Grass **Year:** 1900 Introduced from Europe. Date, location and method of introduction is unknown.

County	Year First Specimen Recorded [1]
Park	1938
Sweet Grass	1900
Stillwater	1989
Carbon	1954
Yellowstone	1963
Treasure	
Rosebud	1959
Custer	
Prairie	1983
Dawson	
Richland	
McKenzie	

Growth Habit:	Biennial, spread by seed. Rosette is formed on ground 1st year, flowering stalks elongates 2nd year.
Leaves:	Velvety to touch. Basal – broad, lance-shaped. Upper – Narrower, pointed clasping stem.
Stem:	Heavy, erect, usually branched above, to 3' tall.
Flower:	Dark red, rarely while, ¼" diameter in terminal clusters.
Roots:	Taproot.
Seeds:	Fruit consists of 4 flattened bur-like nutlets, each ¼" long with short barbed appendages.
Other Notes:	*"Houndstongue is an aggressive weed, which was introduced from Europe. It is a very fast spreading and hard to control weed. It spreads rapidly by means of burrs, which attach to people, domestic pets, livestock, and wildlife.* *Houndstongue is toxic, causing liver cells to stop reproducing. Horses and cattle are particularly susceptible to poisoning by Houndstongue."* (Boulder County CO, 20)

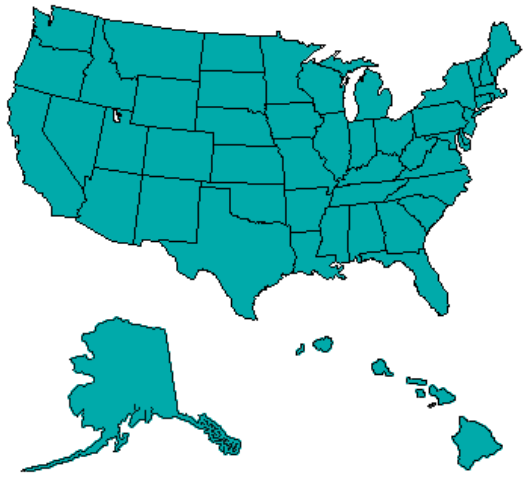
Yellow Toadflax
(Linaria vulgaris)



©Jim Stasz

United States Distribution

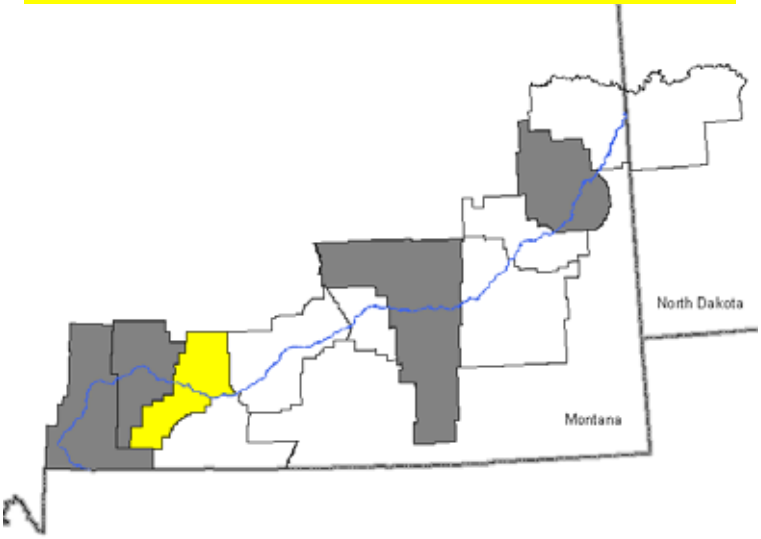
(Noxious and Nuisance Plant Information System U.S. AcoE)



Study reach counties with known infestations

(2004 Montana Noxious Weed Mapping System Section Based Mapping Data & Local Weed Department Survey)

Yellow Indicates Counties That Provided No Information



Yellow Toadflax *(Linaria vulgaris)*

Listing Status:	Listed Noxious Weed In Montana

History:

First Montana Specimen Collected [1]

County: Flathead **Year:** 1899

"Yellow Toadflax is a native of southwestern Asia. The first recorded introduction to the united states was from Wales as a garden ornamental by a Welsh Quaker who came to Delaware with William Penn during the late 1600's. It flourished and was cultivated at other colonial gardens where it spread into the wild (Mitich 1993)." (Carpenter, Murray, 21)

County	Year First Specimen Recorded [1]
Park	1921
Sweet Grass	
Stillwater	
Carbon	1991
Yellowstone	1963
Treasure	
Rosebud	
Custer	
Prairie	
Dawson	1975
Richland	
McKenzie	

Growth Habit:	Perennial, often over 3 ft tall.
Leaves:	Long and narrow, numerous, pale green, smooth and pointed, attached directly to the stem.
Stem:	Smooth, erect and sometimes branched.
Flower:	Snapdragon type, 1 to 1½ inches long with spur, bright yellow with deep orange center.
Roots:	Woody, vigorous, well branched with many laterals.
Seeds:	Round ½ inch diameter, dark brown to black with a papery circular wing.

Other Notes:

"Yellow toadflax is an aggressive invader that is capable of forming colonies. These colonies can easily push out native grasses and other perennials. Colonies of Yellow Toadflax are also capable of adapting and growing in a wide range of environmental conditions.

Yellow Toadflax can reproduce both via seeds and vegativly. Vegetative reproduction has been observed to begin as early as 2-3 weeds after germination.

A stand of Yellow Toadflax has also been observed to increase by 418% in a single season. Patches originally one acre in size have expanded to cover 85 acres in a five year period.

Yellow Toadflax contains a poisonous glucoside that is reportedly toxic to livestock. However it is also consider unpalatable so poisonings are rare." (Miller & Petitmengin, 22)

Dyers Woad
(Isatis tinctoria)

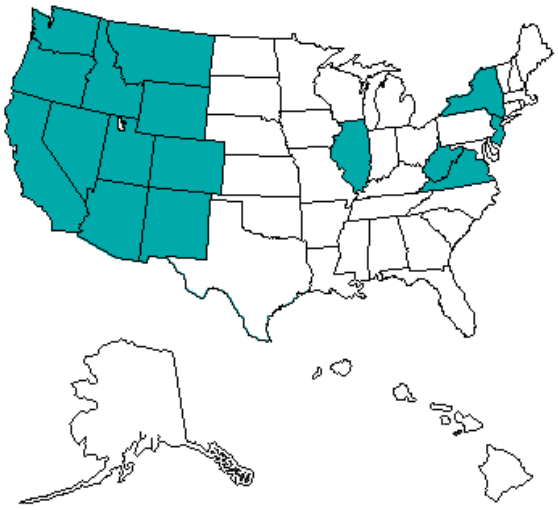
Brother Alfred Brousseau. Courtesy of St. Mary's College of California. ©St. Mary's College of California

Photo by Ron Lang, USDA-APHIS-PPQ, UT

Brother Alfred Brousseau. Courtesy of St. Mary's College of California. ©St. Mary's College of California

United States Distribution

(Noxious and Nuisance Plant Information System U.S. AcoE)



Study reach counties with known infestations

(2004 Montana Noxious Weed Mapping System Section Based Mapping Data & Local Weed Department Survey)

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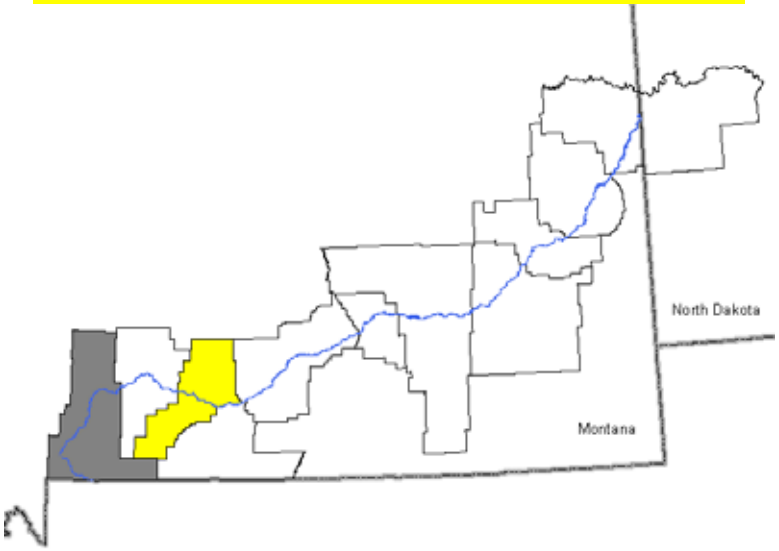


Dyers Woad *(Isatis tinctoria)*

Listing Status:	Listed Noxious Weed In Montana	
History:	**First Montana Specimen Collected** [1] **County:** Missoula **Year:** 1934 *"In the colonial United States, dyers woad was cultivated for dye-making properties. The source of the western establishment is traced to the early 1900's as a contaminant in alfalfa seed from Ireland to a ranch in Siskiyou Co., CA, and as a contaminant in alfalfa seed in Utah. The first herbarium specimen from Utah is dated 1932, where it was found growing near the railroad. Early records indicate that dyers woad was reported from CA, ID, OR, MT, UT and WY;"* (WWCB, 23)	**County** / **Year First Specimen Recorded** [1] Park 1955 Sweet Grass 1991 Stillwater Carbon Yellowstone 1966 Treasure Rosebud Custer Prairie Dawson 1989 Richland McKenzie
Habitat:	Biennial or perennial up to 3 ft. tall. Spreads by seed. Rosette formed 1st year, flowering stem elongates 2nd year.	
Growth Habit:		
Leaves:	Basal rosette leaves are long with short fine hairs. Stem leaves alternate, have short basal lobes clasping the stem and without hair.	
Stem:	Woody, upper portion is branched	
Flower:	Small, yellow, 4 petals 1/8 inch across.	
Roots:	Heavy Tap root with lateral roots within the top foot of soil.	
Seeds:	Plant has many, slightly pear-shaped, winged, black seedpods ½" long that hang like ornaments. Each pod contains one seed. Each plant produces an average of 300 to 500 seeds but can produce as many as 10,000.	
Other Notes:	*"Dyer's Woad will establish along roadsides, gravel pits etc. From these easily established locations it can spread to grasslands, pastures, forests and croplands."* (WWCB, 23)	

Purple Loosestrife or Lythrum

(Lythrum salicaria, L. virgatum, and any hybrid crosses thereof)

Norman E. Rees, USDA ARS

Norman E. Rees, USDA ARS

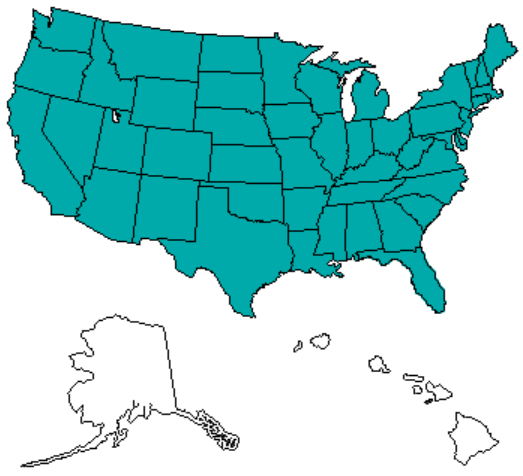
USDA APHIS Archives, USDA APHIS

Eric Coombs, Oregon Department of Agriculture

Photos From Montana State University Archives, Montana State University, www.invasive.org

United States Distribution

(Noxious and Nuisance Plant Information System U.S. AcoE)



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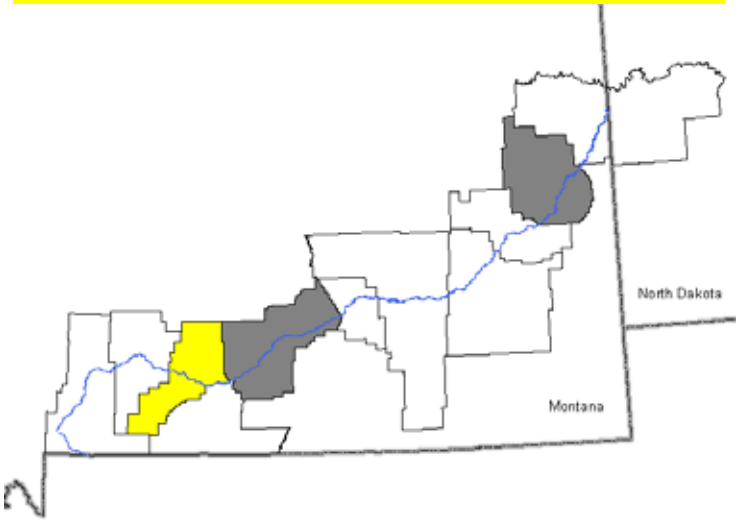

Purple Loosestrife or Lythrum (Lythrum salicaria, L. virgatum, and any hybrid crosses thereof)

Listing Status:	Listed Noxious Weed In Montana & North Dakota		
History:	**First Montana Specimen Collected** [1] **County:** Toole **Year:** 1980 *"Purple Loosestrife (Lythrum salicaria) is a wetland plant from Europe and Asia. It was introduced into the east coast of North America in the 1800s. First spreading along roads, canals and drainage ditches, and then later distributed as an ornamental, this exotic plant is in 40 states and all Canadian border provinces."* (GLIN, 24)	**County**	**Year First Specimen Recorded** [1]
		Park	
		Sweet Grass	
		Stillwater	
		Carbon	
		Yellowstone	1992
		Treasure	
		Rosebud	1994
		Custer	
		Prairie	
		Dawson	1998
		Richland	
		McKenzie	
Growth Habit:	Perennial, erect to 8 feet tall, associated with moist or marshy areas.		
Leaves:	Simple, lance-shaped, smooth margins, opposite or whorled.		
Stem:	Branched, terminating in flowering stalks.		
Flower:	Rose-purple flowers having 5 to 7 petals and numerous stamens, in long, vertical recemes.		
Roots:	Large fleshy, adapted to aquatic sites.		
Seeds:	Average 900 seed capsules per plant with 120 flat thin walled seeds per capsule.		
Other Notes:	*"Due to the quantity of seed produced by Purple Loosestrife it can quickly take over wetland habitat. These stands create a monoculture that can be impenetrable even by boats. Efforts to create better wildlife habitat, by thinning cattails, have resulted in the creation of the perfect pathway for Purple Loosestrife invasion."* (GLIN, 24)		

Tansy Ragwort
(Senecio jacobea L.)

Eric Coombs, Oregon Department of Agriculture

Eric Coombs, Oregon Department of Agriculture

Eric Coombs, Oregon Department of Agriculture

USDA ARS Archives, USDA ARS

Photos From Montana State University Archives, Montana State University, www.invasive.org

United States Distribution

(Noxious and Nuisance Plant Information System U.S. AcoE)

Study reach counties with known infestations

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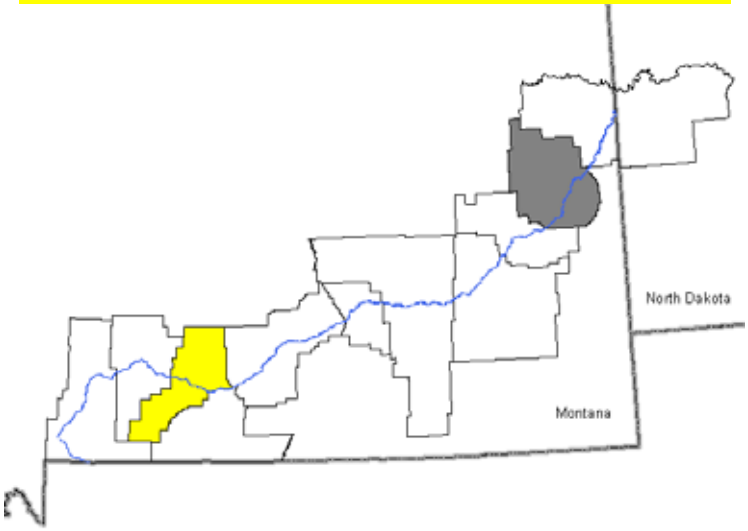

Tansy Ragwort *(Senecio jacobea L.)*

Listing Status:	Listed Noxious Weed In Montana	
History:	**First Montana Specimen Collected** [1] **County:** Mineral **Year:** 1979 *"The first recorded site of tansy ragwort in western North America was on Vancouver Island in 1913 and in Oregon in 1922. Tansy ragwort is now found from northwestern California to British Columbia, from coastal areas continuing east of the Cascade Mountains (Sweeney et al. 1991). The economic impact of tansy ragwort in Oregon during the 1970's included: more than $4 million a year lost in livestock poisoning; the loss of five to ten percent of cattle herds, and dairies were forced to close(Rees et al. 1996)."* (WWCB, 25)	**County** / **Year First Specimen Recorded** [1] Park Sweet Grass Stillwater Carbon Yellowstone Treasure Rosebud Custer Prairie Dawson Richland McKenzie
Growth Habit:	Biennial or short-lived perennial, erect branched near top. Reproduces by seed only.	
Leaves:	Alternate, deeply lobed with irregular margins, terminal lobe larger than lateral ones, cobwebby hairs in early growth stages.	
Stem:	Simple, usually single, to 6 ft. tall.	
Flower:	Flower heads yellow, numerous, in clusters, about 1 inch in diameter.	
Roots:	Small to medium taproot.	
Seeds:	Small, striped, with a protrusion atone end.	
Other Notes:		

Meadow Hawkweed Complex

(Hieracium pretense, H. floribundum, H. piloselloides)

Washington State University Archives, Washington State University

Washington State University Archives, Washington

Photos From Montana State University Archives, Montana State University, www.invasive.org

United States Distribution

(NRCS Plants Database http://plants.usda.gov)

Study reach counties with known infestations

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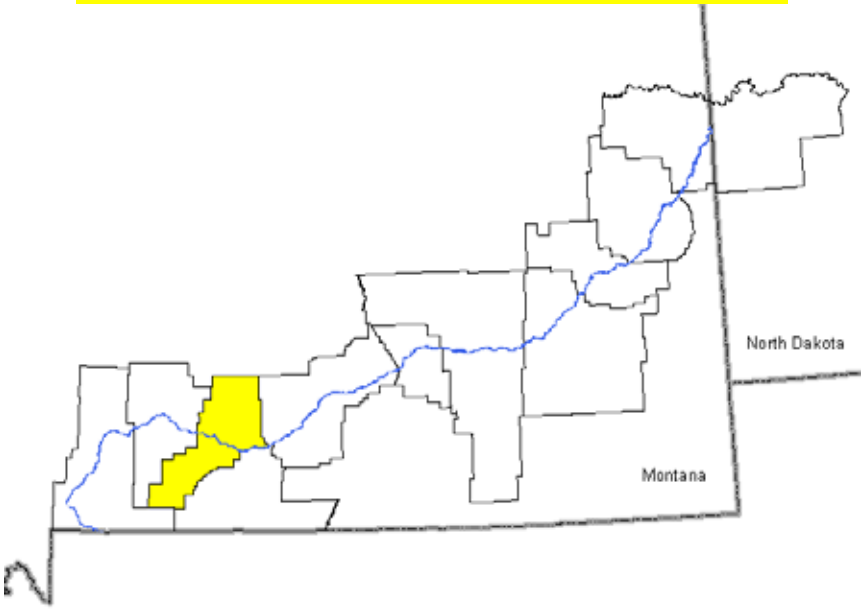

Meadow Hawkweed Complex
(Hieracium pretense, H. floribundum, H. piloselloides)

Listing Status:	Listed Noxious Weed In Montana		
History:	**First Montana Specimen Collected** [1] **County:** Flathead **Year:** 1993	**County**	**Year First Specimen Recorded** [1]
		Park	
		Sweet Grass	
		Stillwater	
		Carbon	
		Yellowstone	
		Treasure	
		Rosebud	
		Custer	
		Prairie	
		Dawson	
		Richland	
		McKenzie	
Growth Habit:	Perennial, erect to 12 inches tall.		
Leaves:	Lance-shaped, hairy, leaves are basal, occasionally 1 to 2 small leaves on stem.		
Stem:	Erect, bristly, terminate in an umbel of flower.		
Flower:	5 to 30 per plant, yellow petals.		
Roots:	Fibrous.		
Seeds:			
Other Notes:			

Orange Hawkweed
(Hieracium aurantiacum L.)

Kenneth J. Sytsma University of Wisconsin-Madison

Scott A. Milburn, St. Paul, MN

Kenneth J. Sytsma University of Wisconsin-Madison

Washington State University Archives, Washington State University

Photos From Montana State University Archives, Montana State University, www.invasive.org

United States Distribution

(NRCS Plants Database http://plants.usda.gov)

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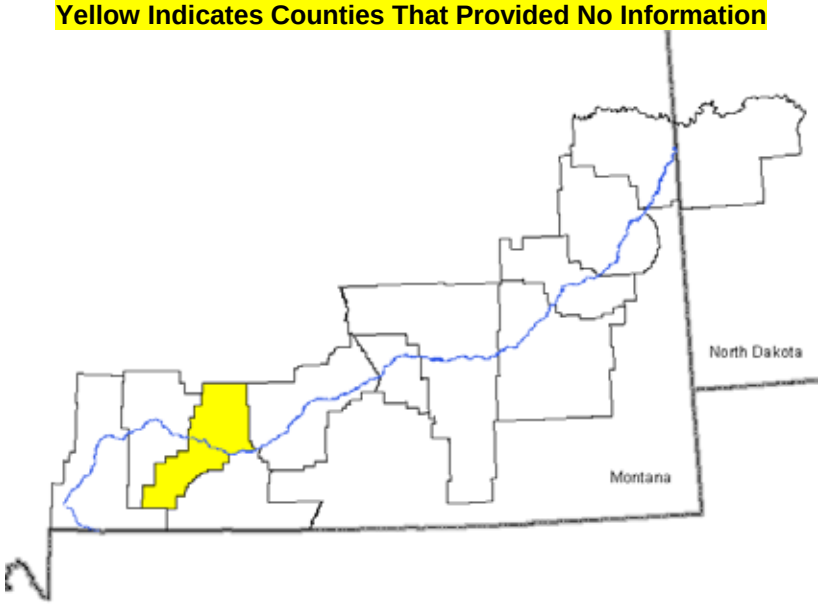

Orange Hawkweed *(Hieracium aurantiacum L.)*

Listing Status:	Listed Noxious Weed In Montana

History:

First Montana Specimen Collected [1]

County: Flathead **Year:** 1963

County	Year First Specimen Recorded [1]
Park	
Sweet Grass	
Stillwater	
Carbon	
Yellowstone	2001
Treasure	
Rosebud	
Custer	
Prairie	
Dawson	
Richland	
McKenzie	

Growth Habit:	Perennial, erect to 12 inches tall.
Leaves:	Lance-shaped, hairy, leaves are basal, occasionally 1 to 2 small leaves on stem.
Stem:	Erect, bristly, terminate, in an umbel of flower heads.
Flower:	5 to 30 per plant, re-orange, petals with notched tips.
Roots:	Fibrous.
Seeds:	
Other Notes:	

Tall Buttercup
(Ranunculus acris L.)

All photos on this page: Brother Alfred Brousseau. Courtesy of St. Mary's College of California. ©St. Mary's College of California

United States Distribution
(Noxious and Nuisance Plant Information System U.S. AcoE)

Study reach counties with known infestations
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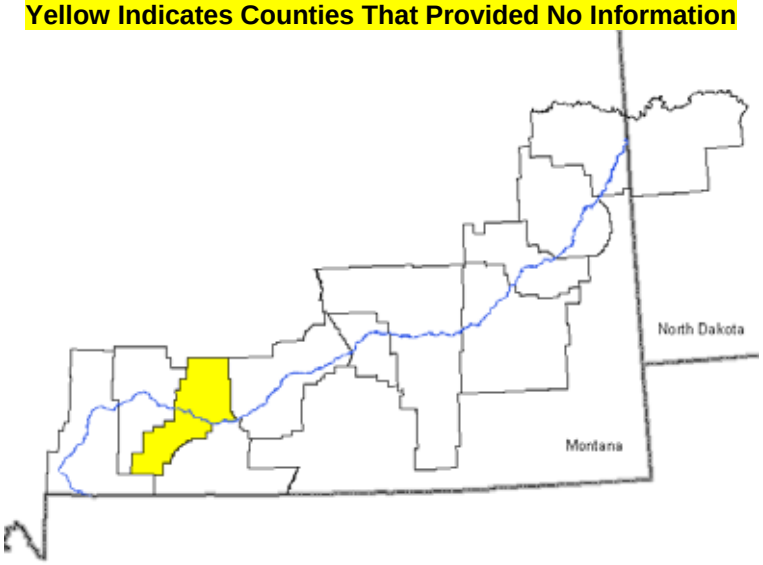
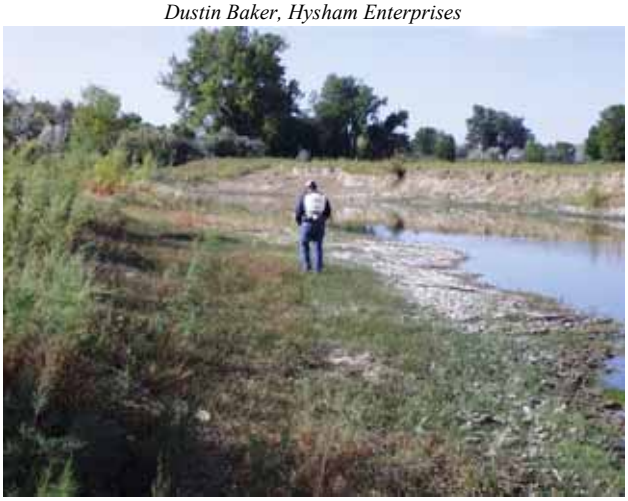


Tall Buttercup *(Ranunculus acris L.)*

Listing Status:	Listed Noxious Weed In Montana	
History:	**First Montana Specimen Collected** [1] **County:** Gallatin **Year:** 1916	**County** / **Year First Specimen Recorded** [1] Park Sweet Grass Stillwater 1920 Carbon 1921 Yellowstone Treasure Rosebud Custer Prairie Dawson Richland McKenzie
Growth Habit:	Perennial forb growing up to 3 feet in height.	
Leaves:	Hairy leaves, deeply lobed (nearly to the base) into three to five segments with each segment lobed again, giving the whole leaf a rages appearance.	
Stem:	Branched hairy stem	
Flower:	Glossy yellow flowers, in loose clusters. Flowers are ¾ to 1 inch in diameter with a greenish center	
Roots:	Thick root stalks with numerous, spreading, course, fibrous, roots	
Seeds:		
Other Notes:		

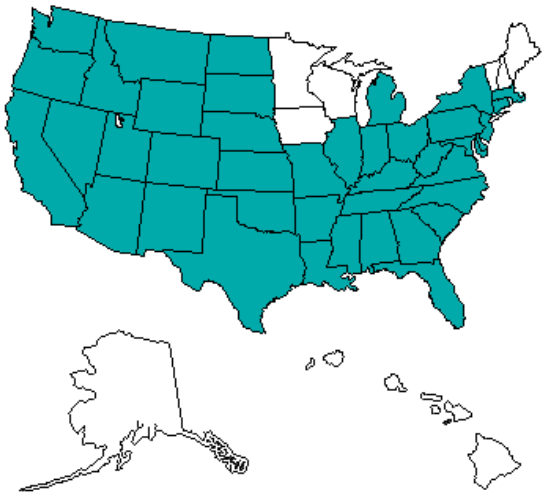
Tamarisk (Saltcedar)
(Tamarix spp.)

Dustin Baker, Hysham Enterprises



Dustin Baker, Hysham Enterprises

United States Distribution
(Noxious and Nuisance Plant Information System U.S. AcoE)



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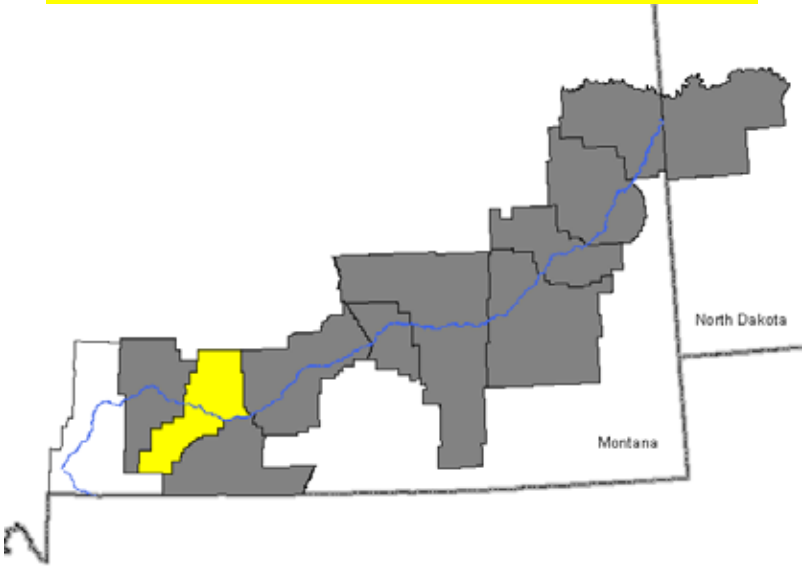


Tamarisk (Saltcedar) *(Tamarix spp.)*

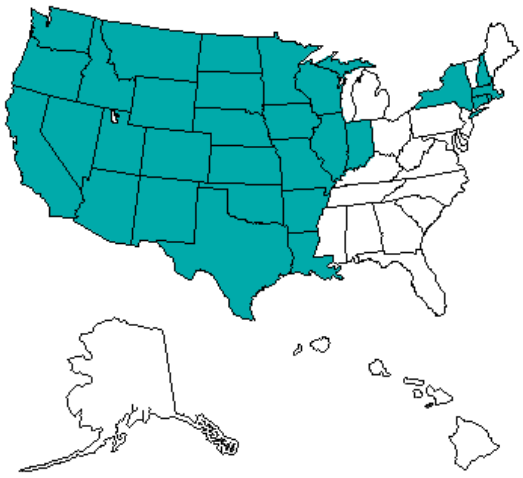
Listing Status:	Listed Noxious Weed In Montana & North Dakota
History:	**First Montana Specimen Collected** [1] **County:** Big Horn **Year:** 1971 *"Tamarisk was brought to the U.S. as early as 1805, and it was widely available as an ornamental on the West coast by the 1870's. Used for ornamental and bank stabilization purposes by 1900 in the lower Colorado River and Rio Grande rivers, tamarisk appeared in the Grand Canyon between 1922 and 1938."* (Stevens, 26)

County	Year First Specimen Recorded [1]
Park	
Sweet Grass	1999
Stillwater	
Carbon	1976
Yellowstone	1981
Treasure	1997
Rosebud	1981
Custer	1978
Prairie	1997
Dawson	1980
Richland	2000
McKenzie	

Growth Habit:	Deciduous or evergreen shrubs or small trees reaching 5 to 20 feet in height.
Leaves:	Small leaves on green stems are alternate, overlap each other and appear scale-like (similar to a cedar tree)
Stem:	Highly branched with a smooth, dark brown to reddish-brown bark.
Flower:	Pink flowers are borne in finger-like clusters.
Roots:	
Seeds:	
Other Notes:	*"Its broad tolerance of drought and inundation, its enormous fecundity and wind-dispersal of seeds quickly allowed tamarisk to spread."* (Stevens, 26) In Montana it has invaded the Yellowstone, Big Horn, Tongue, and Powder Rivers and their tributaries.

Perennial Pepperweed
(Lepidium latifolium)

United States Distribution
(Noxious and Nuisance Plant Information System U.S. AcoE)



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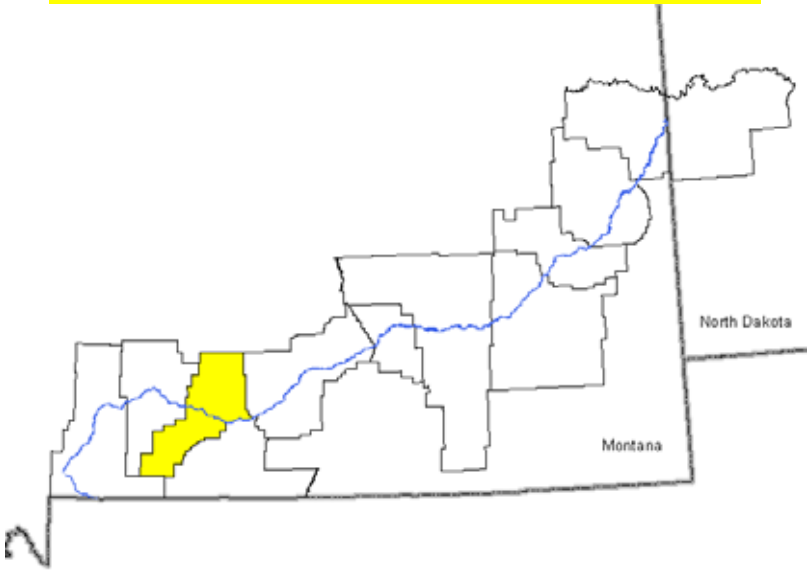


Perennial Pepperweed *(Lepidium latifolium)*

Listing Status:	Listed Noxious Weed In Montana	
History:	**First Montana Specimen Collected** [1] **County:** Gallatin **Year:** 1935 Native to southeastern Europe and western Asia.	**County** / **Year First Specimen Recorded** [1] Park 1962 Sweet Grass Stillwater Carbon Yellowstone Treasure Rosebud Custer Prairie Dawson Richland McKenzie
Growth Habit:	Erect perennial, numerous stems, spreading by seed and deep-seated root stocks.	
Leaves:	Alternate, lance shaped, bright green to gray green, waxy, smooth to toothed margins, basal leaves larger than upper leaves.	
Stem:	Branched, smooth, waxy, 1-3 feet tall.	
Flower:	Raceme of small white flowers in dense clusters near branch ends.	
Roots:	Deep-seated and spreading.	
Seeds:	Small, rounded, flattened, slightly hairy, 1/16 inch long, reddish brown.	
Other Notes:	Currently no known infestations in the Yellowstone River Corridor	

Yellow Starthistle
(Centaurea solstitialis)

Cindy Roche,

Cindy Roche

University of Idaho Archives, University of Idaho

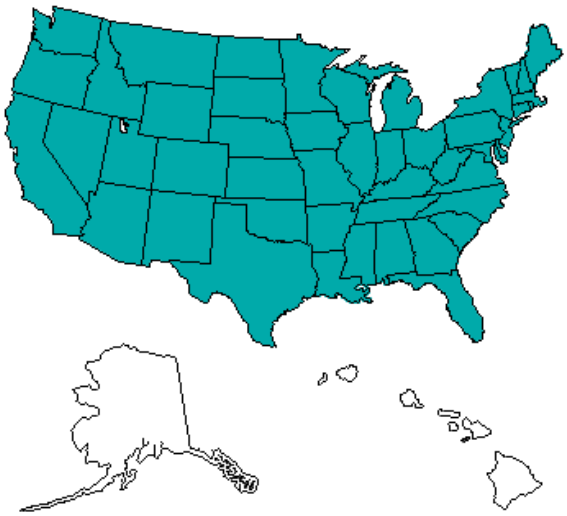
Cindy Roche,

Cindy Roche,

Photos From Montana State University Archives, Montana State University, www.invasive.org

United States Distribution

(Noxious and Nuisance Plant Information System U.S. AcoE)



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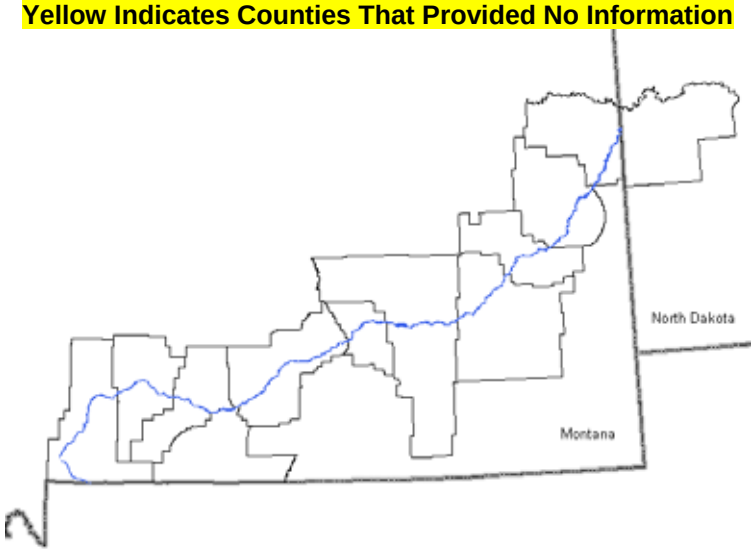


Yellow Starthistle *(Centaurea solstitialis)*

Listing Status:	Listed Noxious Weed In Montana & North Dakota

History:

First Montana Specimen Collected [1]

County: Ravalli **Year:** 1958

"Yellow starthistle is thought to have originated along the Mediterranean Coast and has spread throughout Europe as far as the Asian steppes. Yellow starthistle was first reported growing on ballast grounds near western seaports. Early California records indicate C. solstitialis at Oakland in 1869 and Vacaville in 1887. By 1965, the California Department of Food and Agriculture estimated 1.9 million acres were infested.

By the 1920's it was widely distributed in Eastern Washington. It has spread as far north as Stevens County. An outbreak in Okanogan from certified but contaminated seed occurred following seeding after a fire." (WWCB, 27)

The only known infestation, in the Yellowstone River Corridor, was found in Treasure County in 2001. Theses plants were removed and monitoring has detected no further infestation.

County	Year First Specimen Recorded [1]
Park	
Sweet Grass	1990
Stillwater	
Carbon	1988
Yellowstone	
Treasure	2001
Rosebud	
Custer	
Prairie	
Dawson	
Richland	
McKenzie	

Growth Habit:	Annual, erect, rigid branching stems.
Leaves:	Basal leaves deeply lobed upper leaves not lobed, small, sharply pointed.
Stem:	Rigid, covered with a cottony fiber, to 30 inches tall, winged structures.
Flower:	Yellow, terminal, flower bracts are tipped with straw-colored, ¾ inch thorn.
Roots:	Taproot.
Seeds:	Smooth, light-colored, often darker mottled, 1/8 inch long, notched just above the base.
Other Notes:	Currently no known infestations in the Yellowstone River corridor.

Common Crupina
(Crupina vulgaris)

Photo courtesy Dean Swan, Washington State University

USDA ARS European Biological Control Laboratory, USDA ARS - European Biological
Photos From Montana State University Archives, Montana State University, www.invasive.org

Photo courtesy Dean Swan, Washington State University (retired)

United States Distribution
(Noxious and Nuisance Plant Information System U.S. AcoE)

Study reach counties with known infestations
(2004 Montana Noxious Weed Mapping System Section Based Mapping Data & Local Weed Department Survey)

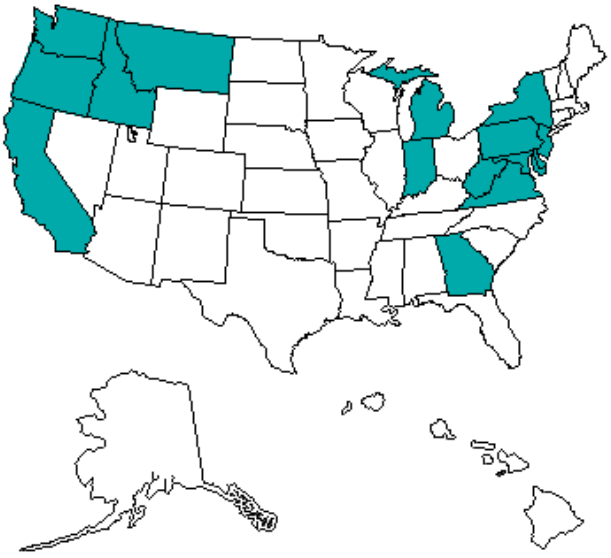
Yellow Indicates Counties That Provided No Information

Common Crupina *(Crupina vulgaris)*

Listing Status:	Listed Noxious Weed In Montana		
History:	**First Montana Specimen Collected** [1] **County:** None **Year:** None *"The source and means of Crupina's introduction into the U.S. is not known (Couderc-LeVaillant and Talbott Roche 1993). The first North American population was discovered in Idaho in 1969 (Stickney 1972). This initial 40-acre infestation spread to 23,000 acres by 1981 (Thill et al 1987). Washington's infestation was discovered in 1984 by a hiking botanist. Control work began in 1988. Initial efforts focused on hand-pulling along rights-of-way. Infestations in Montana are very rare." (WWCB, 28)*	**County**	**Year First Specimen Recorded** [1]
		Park	
		Sweet Grass	
		Stillwater	
		Carbon	
		Yellowstone	
		Treasure	
		Rosebud	
		Custer	
		Prairie	
		Dawson	
		Richland	
		McKenzie	
Growth Habit:	Winter annual, erect to 3 feet tall.		
Leaves:	Rosette leaf margins smooth to slightly toothed, cotyledons have a red to purple midrib. Mature plant leaves alternate, attached directly to stems, deeply lobed or dissected with margins containing short stiff spines.		
Stem:	Stiff, terminating in one to several flowering branches.		
Flower:	1 to 5 heads per branch, narrow cylindrical, pink lavender or purple. Flower in June and July.		
Roots:	Taproot.		
Seeds:	Oblong with a ring of dark stiff bristles encircling the broad end of the seed.		
Other Notes:	Currently no known infestations in the Yellowstone River corridor.		

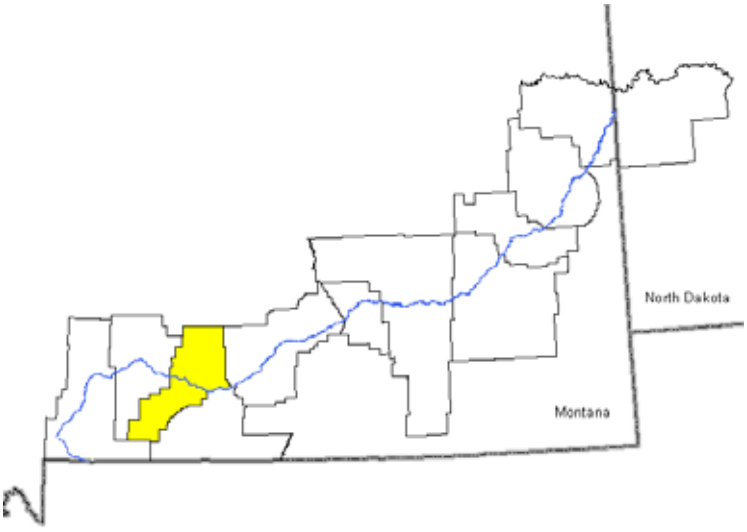
Rush Skeletonweed
(Chondrilla juncea)

United States Distribution
(Noxious and Nuisance Plant Information System U.S. AcoE)



Study reach counties with known infestations
(2004 Montana Noxious Weed Mapping System Section Based Mapping Data & Local Weed Department Survey)

Yellow Indicates Counties That Provided No Information

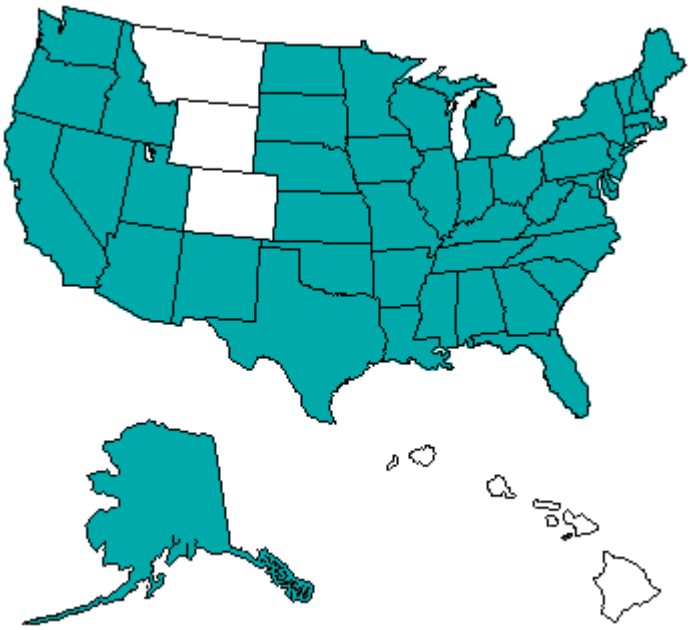


Rush Skeletonweed *(Chondrilla juncea)*

Listing Status:	Listed Noxious Weed In Montana	
History:	**First Montana Specimen Collected** [1] **County:** Sanders **Year:** 1991 *"Rush skeletonweed is native to Asia Minor and the Mediterranean region, including North Africa. It has successfully invaded Australia, Argentina, Italy, Lebanon, New Zealand, Portugal, Spain, the United States and the former Yugoslavia. Rush skeletonweed was first reported in the United States near Spokane, Washington in 1938. It was found in Idaho and Oregon during the 1960s, and currently infests over 6.2 million acres of rangeland in the Pacific Northwest and California. A small infestation was found in Sanders County, Montana, in 1991. A year later, several small infestations were found in Lincoln County. In 1994, several new infestations were found in both counties. It appears that this weed is moving quickly in western Montana."* (Sheley & Hudak, 29)	**County** / **Year First Specimen Recorded** [1] Park Sweet Grass Stillwater Carbon Yellowstone Treasure Rosebud Custer Prairie Dawson Richland McKenzie
Growth Habit:	Perennial, erect to 4 ft. tall.	
Leaves:	Basal rosette leaves – sharply toothed, lance-shaped (dandelion line). Upper leaves-inconspicuous, narrow, smooth margins.	
Stem:	Bottom 1 to 6 inches has numerous, re, downward bent coarse hairs. Stems smooth above, many branched.	
Flower:	Yellow, ¾ inch wide, scattered on branches. 7 to 15 strap-shaped petals are flat across the end of terminating with distinct lobes of teeth.	
Roots:	Extensive and deep.	
Seeds:	Pale brown to black, 1/8 inch long, several ribbed, smooth below with tiny scale projections above, terminated by a long break with numerous soft white bristles.	
Other Notes:	Newly found potential infestation located in the interstate corridor in Treasure County, Montana. The initial opinion is that is was a vehicle-transported infestation.	

Eurasian Watermilfoil
(Myriophyllum spicatum)

United States Distribution
(Noxious and Nuisance Plant Information System U.S. AcoE)



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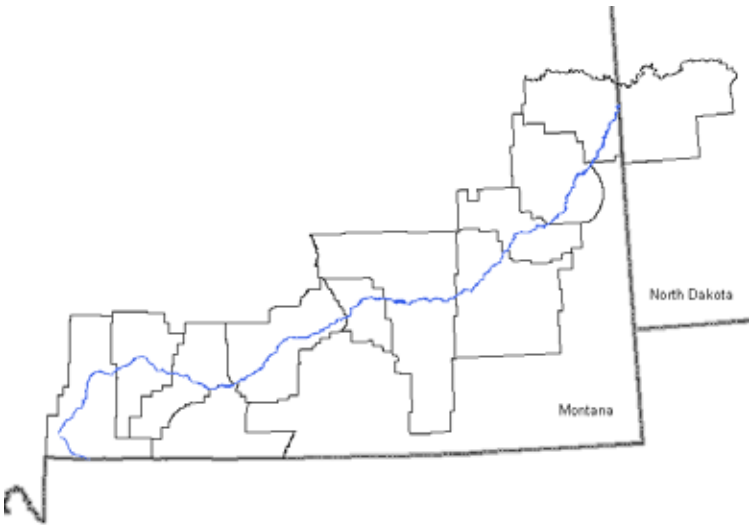

Eurasian Watermilfoil *(Myriophyllum spicatum)*

Listing Status:	Listed Noxious Weed In Montana	
History:	**First Montana Specimen Collected** [1] **County:** None **Year:** None *"Eurasian Watermilfoil may have been introduced to the north American continent a Chesapeake bay in the 1880's. Although Couch and Nelson present evidence that the first collection of Eurasian Watermilfoil was made from a pond in the District of Columbia during the fall of 1942. By 1985 Eurasian Watermilfoil had been found in 33 states and the District of Columbia."* (Simmons, 30)	**County** / **Year First Specimen Recorded** [1] Park Sweet Grass Stillwater Carbon Yellowstone Treasure Rosebud Custer Prairie Dawson Richland McKenzie
Growth Habit:	Submersed Perennial Plant	
Leaves:	Finely dissected, feather like, whorls of 4 (rarely 5) around the stem.	
Stem:	Tassel like tips, often red.	
Flower:	Tiny pinkish on reddish spikes.	
Roots:		
Seeds:	Seeds produced but seedlings rare.	
Other Notes:	Currently no known infestations in the Yellowstone River Corridor. *"Eurasian Watermilfoil can develop into a land form. Leaves of the land form are smaller, stiffer and have fewer divisions. If these plants are submerged, new growth with aquatic leaves develops in 7-10 days, but the first leaves formed have relatively few divisions and only later do the divisions increase to 12 or more leaflet pairs.* *Eurasian Watermilfoil forms dense canopies that often shade out native vegetation. A poor habitat for waterfowl, fish and other wildlife."* (Simmons, 30)	

Yellow Flag Iris
(Iris pseudacorus)

©J.S. Peterson. USDA NRCS NPDC. Valentine Lake, Rapides Parish, LA.

Robert H. Mohlenbrock. USDA NRCS. 1995. Northeast wetland flora: Field office guide to plant species*. Northeast National Technical Center, Chester, PA. Courtesy of USDA NRCS Wetland Science*

©J.S. Peterson. USDA NRCS NPDC. Valentine Lake, Rapides Parish, LA.

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United States Distribution

(Noxious and Nuisance Plant Information System U.S. AcoE)

Study reach counties with known infestations

(2004 Montana Noxious Weed Mapping System Section Based Mapping Data & Local Weed Department Survey)

Yellow Flag Iris *(Iris pseudacorus)*

Listing Status:	Listed Noxious Weed In Montana	
History:	**First Montana Specimen Collected** [1] **County:** None **Year:** None *"Has been found in the wild of the northeastern United States for close to 140 years. Still a horticultural favorite it often escapes cultivation."* (All About Flowers, 31)	**County** / **Year First Specimen Recorded** [1] Park Sweet Grass Stillwater Carbon Yellowstone Treasure Rosebud Custer Prairie Dawson Richland McKenzie
Growth Habit:	Perennial monocot	
Leaves:	Sword like leaves can be 4 to 5 ft tall.	
Stem:		
Flower:	Showy yellow spring flowers with sepals etched in brown or purple.	
Roots:	Thick tuberous rhizomes.	
Seeds:	Germination rates from 48% to 62%	
Other Notes:	Currently no know infestations in the Yellowstone River Corridor. Plants grow vigorously in water or wet soil. Yellow Flag Iris is poisonous. Even when dry it causes gastroenteritis in cattle.	

Musk Thistle
(Carduus nutans L.)

Loke T. Kok, Virginia Polytechnic Institute and State University

Norman E. Rees, USDA ARS

USDA APHIS Archives, USDA APHIS

Norman E. Rees, USDA ARS

Photos From Montana State University Archives, Montana State University, www.invasive.org

United States Distribution

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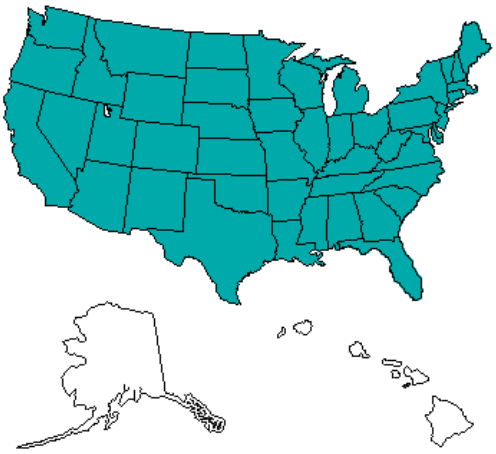

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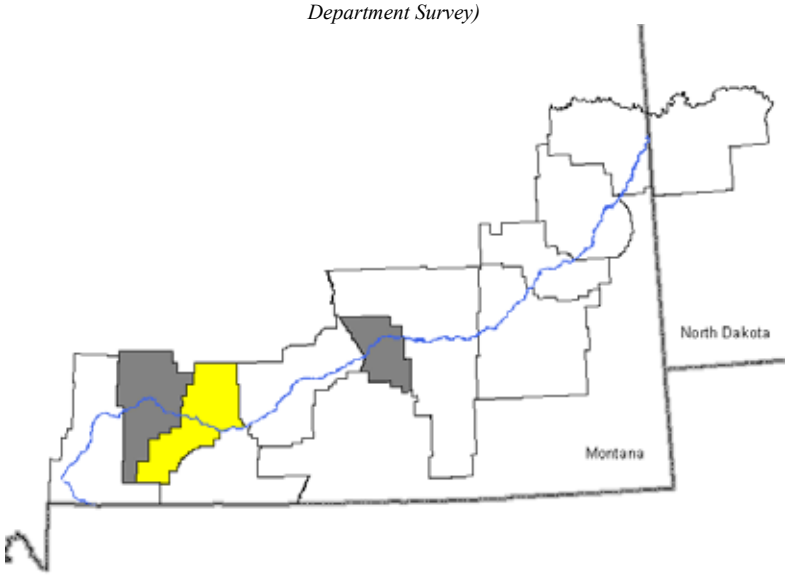

Musk Thistle *(Carduus nutans L.)*

Listing Status:	Listed Noxious Weed In North Dakota

History:

First Montana Specimen Collected [1]

County: Missoula **Year:** 1921

County	Year First Specimen Recorded [1]
Park	1948
Sweet Grass	1991
Stillwater	
Carbon	
Yellowstone	
Treasure	
Rosebud	1991
Custer	
Prairie	
Dawson	
Richland	
McKenzie	

Growth Habit:	Biennial, or winter annual, erect up to 7' tall. Freely branching. Rosette formed 1st year, flowering stem elongates 2nd year.
Leaves:	Dark green with light midrib, hairless on both sides, long sharp spines.
Stem:	Hairless.
Flower:	Solitary, terminal, nodding heads, 1½ " to 3" in diameter, deep rose to violet to purple.
Roots:	Fleshy taproot, hollow near ground surface.
Seeds:	Can be in excess of 20,000 per plant with 90% viable. 90% may germinate in first two years. Seeds may germinate after 10 years in soil.
Other Notes:	Reproduces by seed only.

Absinth Wormwood
(Artemisia absinthium L.)

©J.S. Peterson. USDA NRCS NPDC. Strybing Arboretum, Golden Gate Park, San Francisco, CA.

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United States Distribution
(Noxious and Nuisance Plant Information System U.S. AcoE)

Study reach counties with known infestations
(2004 Montana Noxious Weed Mapping System Section Based Mapping Data & Local Weed Department Survey)

Absinth Wormwood (*Artemisia absinthium L.*)

Listing Status:	Listed Noxious Weed In North Dakota and Carbon County, Montana

History:

First Montana Specimen Collected [1]

County: Lewis & Clark **Year:** 1898

County	Year First Specimen Recorded [1]
Park	
Sweet Grass	
Stillwater	
Carbon	1986
Yellowstone	1975
Treasure	
Rosebud	
Custer	1994
Prairie	
Dawson	
Richland	
McKenzie	

Growth Habit:	Erect, perennial, up to 4 feet tall.
Leaves:	1 to 3 inches long, deeply dissected, covered with fine hair, a gray or silver color.
Stem:	Erect, covered with fine hairs.
Flower:	Small, yellow, in panicles toward top of plant.
Roots:	Large, woody taproot.
Seeds:	Formed in late summer and fall.
Other Notes:	

Puncture Vine
(Tribulus terrestris L.)

Eric Coombs, Oregon Department of Agriculture

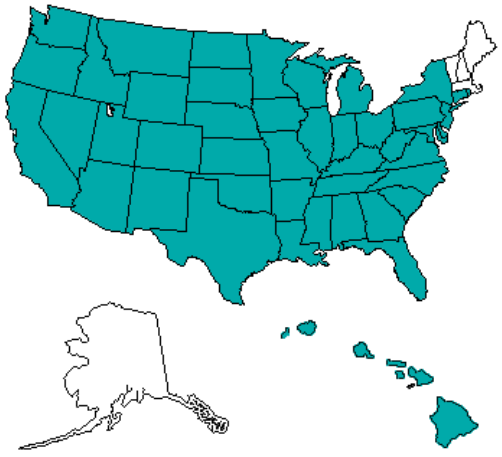
Eric Coombs, Oregon Department of Agriculture

Eric Coombs, Oregon Department of Agriculture

Photos From Montana State University Archives, Montana State University, www.invasive.org

United States Distribution

(Noxious and Nuisance Plant Information System U.S. AcoE)



Study reach counties with known infestations

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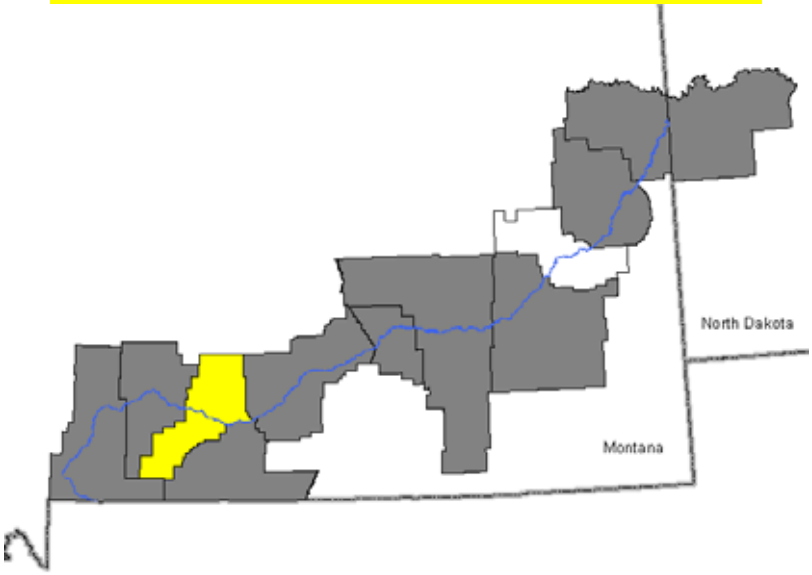

Puncture Vine *(Tribulus terrestris L.)*

Listing Status:	Listed Noxious Weed In Yellowstone & Rosebud Counties, Montana		
History:	**First Montana Specimen Collected** [1] **County:** **Year:**	**County**	**Year First Specimen Recorded** [1]
		Park	
		Sweet Grass	
		Stillwater	
		Carbon	
		Yellowstone	
		Treasure	
		Rosebud	
		Custer	
		Prairie	
		Dawson	
		Richland	
		McKenzie	
Growth Habit:	Annual, mat forming, trailing stems to 5 feet long.		
Leaves:	Opposite hairy, divided into 4 to 8 pairs of leaflets. Oval leafelets ¼ to ½ inch wide.		
Stem:	Prostrate, trailing, hairy, many branched from root crown.		
Flower:	5 petals, yellow, in leaf avils, to ½ inch wide.		
Roots:	Fibrous		
Seeds:	Fruit breaks into sections with 2 to 4 seeds per capsule. Capsules tack like structures with 2 sharp spines, resembling the head of a goat.		
Other Notes:			

Poison Hemlock
(Conium maculatum L.)

William & Wilma Follette. USDA NRCS. 1992. Western wetland flora: Field office guide to plant species. *West Region, Sacramento, CA.*

Eric Coombs, Oregon Department of Agriculture

Eric Coombs, Oregon Department of Agriculture

Photos From Montana State University Archives, Montana State University, www.invasive.org

United States Distribution

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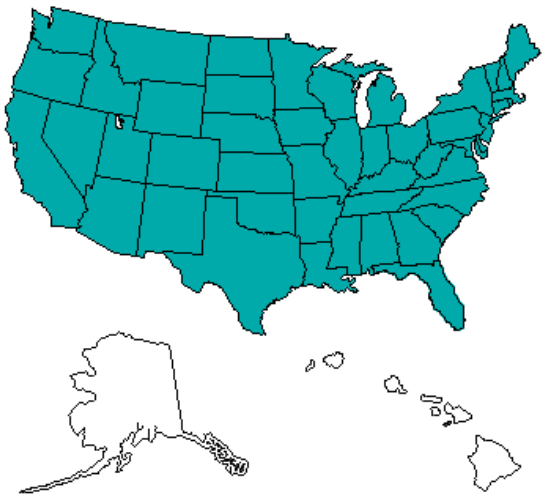

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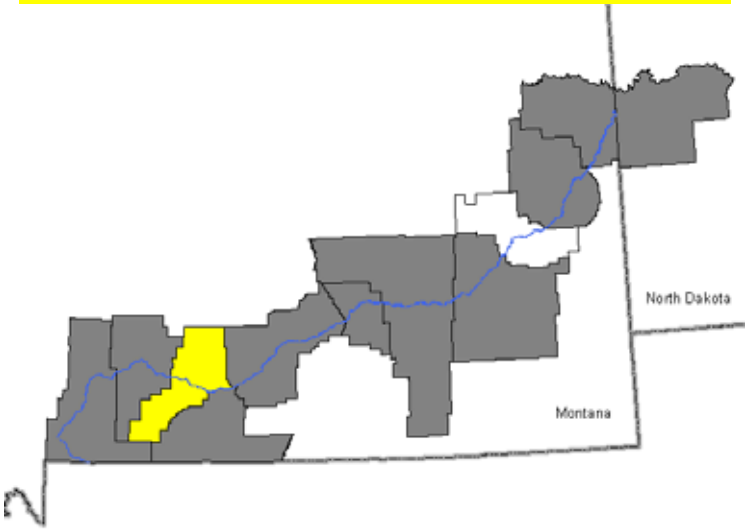


Poison Hemlock *(Conium maculatum L.)*

Listing Status:	Listed Noxious Weed In Yellowstone & Rosebud Counties, Montana

History:

First Montana Specimen Collected [1]	
County:	**Year:**

County	Year First Specimen Recorded [1]
Park	
Sweet Grass	
Stillwater	
Carbon	
Yellowstone	
Treasure	
Rosebud	
Custer	
Prairie	
Dawson	
Richland	
McKenzie	

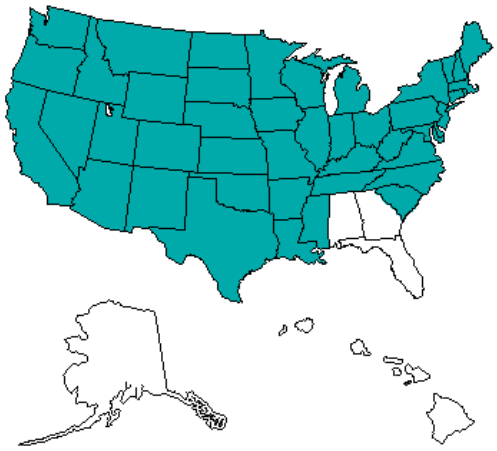
Growth Habit:	Biennial, erect to 10 feet tall
Leaves:	Shiny green, fern-like, finely divided 3 and 4 times. Lower leaves have long stalks clasping the stem. Upper leaves on short stalks. Musty odor.
Stem:	Stout, branched, purple spotted with distinct ridges.
Flower:	Numerous umbrella shaped clusters of tiny white flowers without sepals. Clusters supported by stalks whorled at branch terminals.
Roots:	Large white tap root.
Seeds:	Paired, 1/8 inch long, ribbed, concave, light brown.
Other Notes:	All plant parts are poisonous.

Kochia
(Scoparia (L.) Schrad)

Robert H. Mohlenbrock. USDA NRCS. 1992. Western wetland flora: Field office guide to plant species. *West Region, Sacramento, CA.*

United States Distribution

(Noxious and Nuisance Plant Information System U.S. AcoE)



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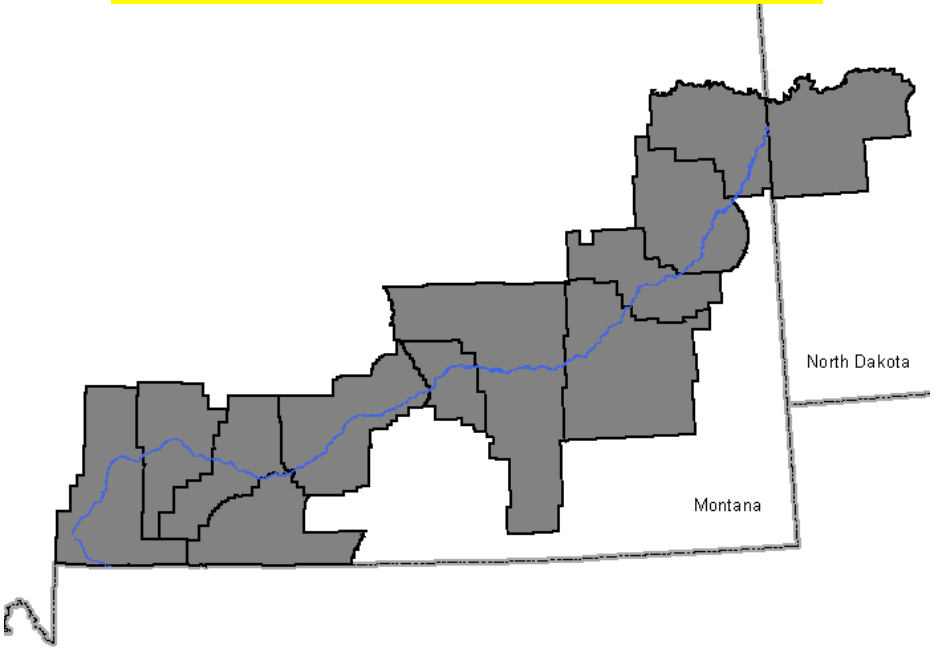

Kochia *(Kochia spp.)*

Listing Status:	Listed Noxious Weed In Rosebud County, Montana		
History:	**First Montana Specimen Collected [1]** **County:** **Year:**	**County**	**Year First Specimen Recorded [1]**
		Park Sweet Grass Stillwater Carbon Yellowstone Treasure Rosebud Custer Prairie Dawson Richland McKenzie	
Growth Habit:	Kochia plants typically possess a bushy growth habit.		
Leaves:	Leaves are linear to narrowly lanceolate, alternate, hairy and sessile.		
Stem:	Woody thick branching stems		
Flower:	Kochia flowers are small, green and apelatous and are found in clusters in the axils of upper leaves and in terminal spikes.		
Roots:			
Seeds:	Kochia is a small seeded species. Seeds are typically 1/16" in diameter, oval, flattened and grooved on each side. As mentioned previously plants typically produce 13 – 15,000 seeds per plant.		
Other Notes:	*"Kochia is a very competitive species. It reduces crop yield most under dry conditions. It produces more dry matter under dry conditions than under medium or wet conditions. Kochia roots were found to a depth of 16 ft. when in competition with a sorghum crop. Kochia is highly plastic in its growth form. Normally plants are bushy and 2 – 3 ft. tall but under competitive conditions plants can reach 7 – 8 ft. in height. Kochia suffers more from intra rather than inter-specific competition. Phtotoxins have been shown to reduce the growth and competitiveness between Kochia seedlings.* *All species in the species-group can be utilized as forage for livestock. The nutritive value is high if plants are harvested timely. This is especially useful for the desert shrub species, which potentially can be productive in a harsh environment."*(Mullenix, 32)		

Common Mullein
(Verbascum thapsus L.)

Dave Powell, USDA Forest Service

Dave Powell, USDA Forest Service

Dave Powell, USDA Forest Service

Photos From Montana State University Archives, Montana State University, www.invasive.org

United States Distribution
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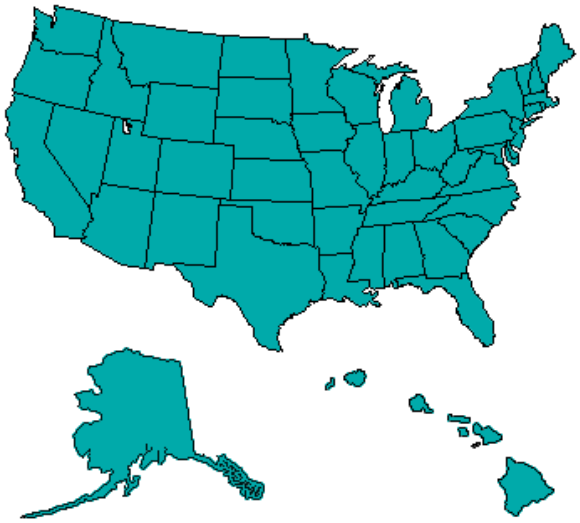

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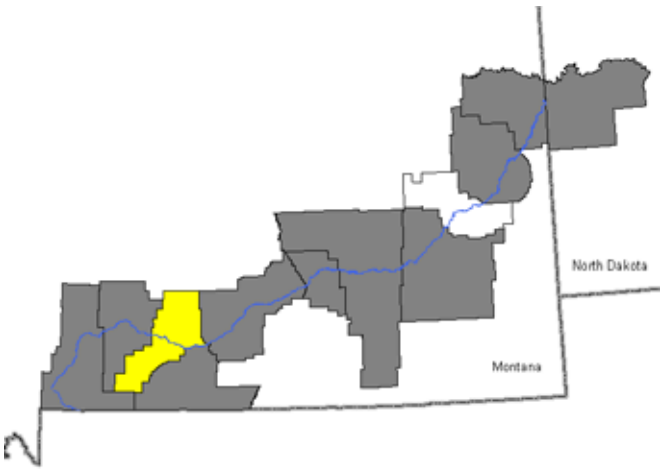

Common Mullein *(Verbascum thapsus L.)*

Listing Status:	Listed Noxious Weed In Yellowstone County, Montana		
History:	**First Montana Specimen Collected [1]** **County:** **Year:** *"The Puritans, who used the plant as a medicinal herb, brought common mullein to America. Teas and ointments made from the leaves of this weed continued to be used for many years as a 'cure' for lung diseases, rheumatism, burns, rashes, and earaches."* (VTIDG, 33)	**County**	**Year First Specimen Recorded [1]**
		Park	
		Sweet Grass	
		Stillwater	
		Carbon	
		Yellowstone	
		Treasure	
		Rosebud	
		Custer	
		Prairie	
		Dawson	
		Richland	
		McKenzie	
Growth Habit:	Biennial—growing as an unobtrusive leafy rosette the first year, and blooming the second year.		
Leaves:	Large dusty-green, hairy leaves.		
Stem:	Long stems.		
Flower:	Dense clusters ("racemes") of small five-petaled, flowers.		
Roots:			
Seeds:	Plants produce great numbers of seeds and spread easily		
Other Notes:	*"A biennial that may reach as much as 7 feet in height with large woolly leaves and a long spike with many showy yellow flowers Common mullein is primarily a weed of pastures, hay fields, roadsides, right-of-ways, and abandoned areas. It is found throughout the United States except for the upper Great Plains."* (VTIDG, 33)		

Showy Milkweed
(Asclepias speciosa Torr.)

Robert Tatina. USDA SCS. 1989. Midwest wetland flora: Field office illustrated guide to plant species. *Midwest National Technical Center, Lincoln, NE. Courtesy of USDA NRCS Wetland Science Institute.*

©J.S. Peterson. USDA NRCS NPDC. The Arboretum at Flagstaff, AZ. July 14, 2001.

Brother Alfred Brousseau. Courtesy of St. Mary's College of California. ©St. Mary's College of California.

United States Distribution
(Noxious and Nuisance Plant Information System U.S. AcoE)

No Information Available

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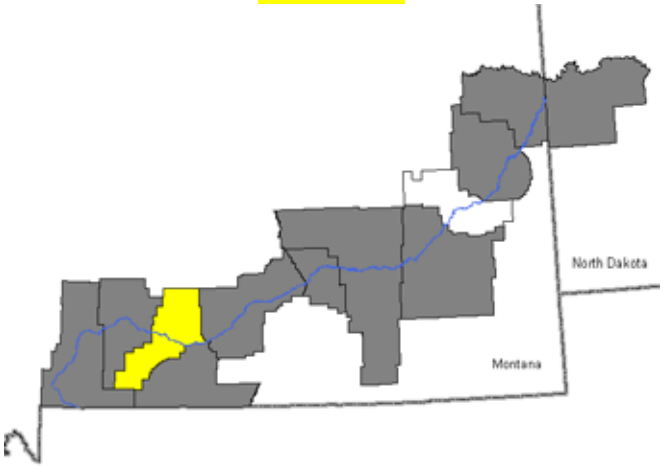

Showy Milkweed *(Asclepias speciosa Torr.)*

Listing Status:	Listed Noxious Weed In Yellowstone County, Montana		
History:	**First Montana Specimen Collected [1]** **County:** **Year:** Poisonous native plant	**County** Park Sweet Grass Stillwater Carbon Yellowstone Treasure Rosebud Custer Prairie Dawson Richland McKenzie	**Year First Specimen Recorded [1]**
Growth Habit:	Creeping Perennial		
Leaves:	Appear Grayish green due to the soft hairs covering the surface.		
Stem:			
Flower:	Pink & White, Outer petals and inner five prong corona seated on the stamen tube.		
Roots:	Creeping root stalks		
Seeds:	Reddish brown flattened seeds with tufts of silky hair		
Other Notes:	White sticky latex in stem and leaves; sometimes used as an ornamental to attach butterflies.		

Western Water Hemlock

(Cicuta douglasii)

Robert H. Mohlenbrock. USDA NRCS. 1992. Western wetland flora: Field office guide to plant species. *West Region, Sacramento, CA. Courtesy of* *USDA NRCS Wetland Science Institute*

J. E.(Jed) and Bonnie McClellan
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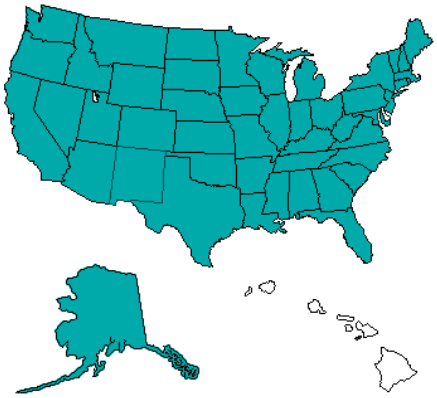
United States Distribution

(*Noxious and Nuisance Plant Information System U.S. AcoE)*



Study reach counties with known infestations

(2004 Montana Noxious Weed Mapping System Section Based Mapping Data & Local Weed Department Survey)

Yellow Indicates Counties That Provided No Information

This plant was not included in the survey of Counties.

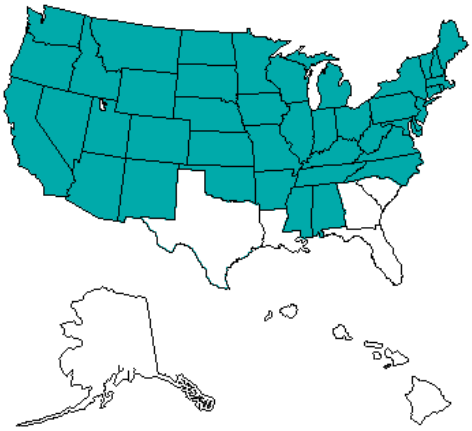
Western Water Hemlock *(Cicuta douglasii)*

Listing Status:	Listed Noxious Weed In Yellowstone County, Montana.	
History:	**First Montana Specimen Collected [1]** **County:** **Year:**	**County** / **Year First Specimen Recorded [1]** Park Sweet Grass Stillwater Carbon Yellowstone Treasure Rosebud Custer Prairie Dawson Richland McKenzie
Habitat:		
Growth Habit:	Western water hemlock is a stout, erect, much-branched herb.	
Leaves:	Leaves of western water hemlock are compound (2-3 times) pinnate, alternate, with leaflets 5-8 cm long and 1-2 cm wide. Leaflets have serrated edges, with leaf veins terminating in the notches of the serrations, and not at the tips. Basal leaves develop swellings where the petiole joins the rootstock; above ground rootstocks are produced from these meristematic regions.	
Stem:	The stem of the forb is smooth and hollow, except at the nodes. Purple spots are often visible on the stem.	
Flower:	Western water hemlock has compound umbellate inflorescences, comprised of many small, white flowers, with few or no bracts present.	
Roots:	Western water hemlock has thick, tuberous roots, with many smaller tubers radiating from the main tuber. The tubers have internal chambers that are visible when the roots are cut.	
Seeds:	The fruits of western water hemlock are ovate-circular, 2-4 mm long, prominently ribbed, with a spongy, brown coat.	
Other Notes:	*"Western water hemlock is a highly toxic member of the parsnip family. The plant is poisonous to all types of livestock and humans. The onset of symptoms is so rapid that treatment is usually unsuccessful"* (Gov. B.C., 34).	

Common Teasel
(Dipsacus fullonum L.)

©James L. Reveal. Courtesy of Smithsonian Institution, Dept. of Systematic Biology, Botany.

United States Distribution
(Noxious and Nuisance Plant Information System U.S. AcoE)



Study reach counties with known infestations
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Yellow Indicates Counties That Provided No Information

This plant was not included in the survey of Counties.

Common Teasel *(Dipsacus fullonum L.)*

Listing Status:	Listed Noxious Weed In Yellowstone County, Montana	
History:	**First Montana Specimen Collected [1]** **County:** **Year:** European plants introduced to North America in the 1700's	**County** / **Year First Specimen Recorded [1]** Park Sweet Grass Stillwater Carbon Yellowstone Treasure Rosebud Custer Prairie Dawson Richland McKenzie
Growth Habit:	Erect biennial	
Leaves:	Oval to round in shape have rounded or scalloped teeth and have an overall, wrinkled appearance.	
Stem:	Erect and branching, many downward turned prickles.	
Flower:	Pale purple in color, stub ended by sharp stiff bracts, 2000 up to 30,000 seeds per plant 80% germination.	
Roots:		
Seeds:	Ribbed appearance covered with short brownish hairs.	
Other Notes:		

Blue Mustard
(Corispora tenella)

Courtesy of Smithsonian Institution, Dept. of Systematic Biology, Botany.

Courtesy of Smithsonian Institution, Dept. of Systematic Biology, Botany

http://www.swcoloradowildflowers.com/

United States Distribution
(Noxious and Nuisance Plant Information System U.S. AcoE)

No Information Available

Study reach counties with known infestations
(2004 Montana Noxious Weed Mapping System Section Based Mapping Data & Local Weed Department Survey)
Yellow Indicates Counties That Provided No Information

This plant was not included in the survey of Counties.

Blue Mustard (Corispora tenella)

Listing Status:	Listed Noxious Weed In Yellowstone County, Montana		
History:	**First Montana Specimen Collected [1]** **County:** **Year:**	**County**	**Year First Specimen Recorded [1]**
		Park Sweet Grass Stillwater Carbon Yellowstone Treasure Rosebud Custer Prairie Dawson Richland McKenzie	
Growth Habit:			
Leaves:			
Stem:			
Flower:			
Roots:			
Seeds:			
Other Notes:			

Appendix B – Biocontrol Insect Reference Information

Information, contained in the tables, in this section was taken directly from *Biological Control of Weeds in the West*. Contributing agencies to this work were: USDA Agricultural Research Service, Montana Department of Agriculture and Montana State University. Published by Western Society of Weed Science.

Knapweed Root Weevil
(Cyphocleonus achates)

J. Johnson

Montana State University Archives

USDA ARS Archives

USDA ARS Archives

Biological Control: A Guide of Natural Enemies of North America Web Site

Photos From Montana State University Archives, Montana State University, www.invasive.org

Knapweed Root Weevil *(Cyphocleonus achates)*

Used In:	Yellowstone and Park Counties in Montana
Common Name:	Knapweed root weevil.
Type Of Agent:	**Insect:** Beetle, weevil (Coleoptera: Curculionidae)
Native distribution:	Eastern and southern Europe and Asia Minor, including the former Czechoslovakia, Austria, Hungary, Romania, Bulgaria, Greece, Turkey, Syria, and the former USSR. Original sources: Austria, Greece, Hungary, and Romania.
BIOLOGY	
Generations Per Year:	One
Overwintering Stage:	Larval
Egg Stage:	Eggs are laid singly in a notch excavated by the female on the root crown, just below the soil surface. Females may deposit more than 100 eggs. Eggs are oval and white to pale yellow when laid, becoming yellower with age. They hatch in 10 to 12 days.
Larval Stage:	Immediately upon hatching, the larvae mine toward the cortex of the root. There are four larval instars, with the second instar overwintering. Third- and fourth-instar larvae cause a gall-like enlargement in the root.
Pupal Stage:	Pupation occurs within the galled root. The pupal period lasts about two weeks.
Adult Stage:	Adults emerge from early August to mid-September. The adult weevils feed on knapweed leaves, preferring those of young plants. Adults are 14 to 15 mm (0.56 to 0.6 in) long and generally live eight to 15 weeks, but do not overwinter. A single female will mate several times during her lifetime.
EFFECT	
Destructive stage:	Larval.
Plant species attacked:	This root weevil prefers spotted knapweed (Centaurea maculosa), but also attacks diffuse knapwecd (C. diffusa).
Site of attack:	Larvae mine and gall the central vascular tissue of the roots.
Impact on the host:	Newly hatched larvae mine into the root cortex. Feeding by older larvae causes considerable damage to the root, especially to small plants or plants containing multiple larvae.
RELEASES	
First introduced into the United States:	1988, Montana and Washington.
Now established in:	Colorado, Montana, Oregon, and Washington.
Habitat:	In Oregon this weevil prefers well drained soils that lack dense vegetation other than knapweed.
Availability:	
Stage to transfer:	Adult.
Redistribution:	Adults can be collected either from the field or from infested roots that have been placed in a sleeve box for adult emergence.

COMMENTS

This large root-galling weevil is one of four insects that attack the central vascular tissue of diffuse and spotted knapweed in Europe. It coexists there with the other three root-feeding insects (Agapeta zoegana, Pterolonche inspersa, and Sphenoptera jugoslavica) that have already been released against knapweeds in North America. Cyphocleonus achates has a wide geographic range in Europe and should be destructive to its weedy hosts over a large area of North America. A closely related species, C. piger, is a pest of cultivated artichoke and beets and is differentiated only by an extra groove on the snout.

Copper Leafy Spurge Flea Beetle
(Aphthona flava)

USDA APHIS PPQ Archives

USDA ARS Archives

Neal Spencer

Heather Faubert

Photos From Montana State University Archives, Montana State University, www.invasive.org

Copper Leafy Spurge Flea Beetle *(Aphthona flava)*	
Used In:	Yellowstone County, Montana
Common Name:	Copper leafy spurge flea beetle, amber spurge flea beetle.
Type Of Agent:	Insect: Beetle, flea beetle (Coleoptera: Chrysonlelidae).
Native distribution:	Europe.
BIOLOGY	
Generations Per Year:	One.

Overwintering Stage:	Larval (within young leafy spurge roots).
Egg Stage:	The eggs are deposited in June through early fall, generally on the plant stem at or below the soil surface, and sometimes on or in the soil but near the plant stem.
Larval Stage:	The larvae are active from July through early spring of the following year. The young larvae begin feeding in/on the root hairs; as they become older and larger, they migrate to the larger roots. They are difficult to observe except under a microscope. The more mature larvae are whitish and worm-like and can be observed with the naked eye in freshly extracted roots.
Pupal Stage:	Pupation occurs in a soil cell from late spring to early summer.
Adult Stage:	Adults will emerge in June through early fall, depending on degree-days. This species is larger and yellower than *Aphthona cyparissiae* and *A. nigriscutis.* It has the characteristic flea beetle appearance and jumps when disturbed. Adult males are about 3.4 mm (0.13 in) long; females are about 3.6 mm (0.14 in) long.
EFFECT	
Destructive stage:	Adult (on the leaves) and larval (root hairs and young roots).
Plant species attacked:	Leafy spurge *(Euphorbia esula)* complex.
Site of attack:	Adult beetles feed on the leaves and flowers; larvae feed in/on the root hairs and young roots.
Impact on the host:	Feeding on the foliage reduces photosynthesis, and flower consumption slightly reduces flowering ability. Feeding within the roots reduces the plant's ability to absorb moisture and nutrients. Light populations reduce plant height and retard flowering, while high populations reduce plant density and cause what is often referred to as "a hole in the spurge." At one research site this species reduced the aerial portion of leafy spurge in a 212 by 167 m (700 by 550 ft) area in six years from 57% to less than 2%.
RELEASES	
First introduced into the United States:	1985, Montana.
Now established in:	Colorado, Idaho, Iowa, Minnesota, Montana, Nebraska, North Dakota, Oregon, South Dakota, Utah, Washington, Wisconsin, and Wyoming.
Habitat:	The best areas for this beetle arc on south-facing slopes in cooler climates that receive 46 to 51 cm (18 to 20 in) of moisture per year. Sunny locations are also desirable. Thc beetles are hard to establish in clay or acidic soils and in heavily shaded areas.
Availability:	
Stage to transfer:	Adult.
Redistribution:	Collect the beetles with a sweep net from late June through mid-August. Beetles can be kept several days at room temperature if given fresh leafy spurge leaves and confined in containers. The beetles can also be maintained for several weeks at room temperature if kept in large cages and given fresh 1hod, or for several weeks if kept cool and fed and exercised periodically at room temperature. However, the longer they are kept in captivity, the fewer eggs will remain for the field. To release, sprinkle beetles on moderately dense leafy spurge plants. Areas of high ant activity should be avoided for initial releases. Frozen roots and soil that contain overwintering larvae can be dug from the field during winter and kept frozen until several weeks before adults are desired. The beetles can then be reared at ambient or room temperature.
COMMENTS	
This was the first leafy spurge flea beetle released in the United States. In the area near Bozeman, MT, its effect has been spectacular. After this species is released, leafy spurge plant density is greatly diminished at first. However, roots that were not attacked (including the taproot) are able to send tip new shoots to supply the sugars for root reserves. It is only through the persistence of the beetles over a long period of time in ecosystems that favor beetle survival that the lateral roots of leafy spurge are destroyed, the taproots weakened, and the plants eliminated from the area. Eric Maw covers several species *of Apbtbona* in his master's thesis from the University of Alberta, and provides excellent descriptions of the larval and pupal stages of A. *typarissiae, A. czwalinae,* and *A.flava.* Like many of the other flea beetle species that attack leafy spurge, this species tends to congregate for feeding, mating, and egg-laying.	

Brown Legged Leafy Spurge Flea Beetle
(Aphthona Lacertosa)

USDA ARS Archives

Richard A. Casagrande

USDA APHIS PPQ Archives

Photos From Montana State University Archives, Montana State University, www.invasive.org, Unless otherwise cited.

Brown Legged Leafy Spurge Flea Beetle *(Aphthona Lacertosa)*	
Used In:	Carbon and Yellowstone Counties, Montana
Type Of Agent:	Insect: Beetle, flea beetle
Native distribution:	Austria, Italy, the former Yugoslavia, and eastern Hungary
BIOLOGY	
Generations Per Year:	One
Overwintering Stage:	Larval (Within the spurge roots).
Egg Stage:	The eggs are deposited in small batches underground near the root of their host over a period of several

	months during the summer.
Larval Stage:	Upon hatching, the larvae migrate to the root hairs and geed until the onset of cool fall temperatures and dormancy
Pupal Stage:	Pupation occurs within a soil cell from late spring to early summer.
Adult Stage:	The adults emerge throughout the summer and feed on the leaves of leafy spurge. Each female produces 200 to 300 eggs. Adults are about 3 mm (0.12 in) long, clabk and resemble A. czwalinae, except the hind femora are brown.
EFFECT	
Destructive stage:	Larval and adult.
Plant species attacked:	Cypress Spurge, with a lesser preference for leafy spurge. This species does not survive outside of the sub genus Esula.
Site of attack:	Adult (leaves and flowers) and larval (within the root hairs and young roots).
Impact on the host:	As with the other flea beetle species, the beetles reduce the plant's root reserves and diminish its ability to replace them. Since the beetles are concentrated in the feeding areas, the effects are obvious. In low populations the affected plants are shorter and have delayed flowering periods. High concentrations of the beetles reduce plant density, or cause what is often referred to as "a hole in the spurge"
RELEASES	
First introduced into the United States:	North Dakota; cleared for release in 1993
Now established in:	Montana, North Dakota, Oregon, and Washington
Habitat:	Found in steppe biome of western Europe, mesic-dry to wet sites, with loamy soils and well developed herbaceous vegetation. Dry sites or flooded areas considered unfavorable.
Availability:	
Stage to transfer:	Adult.
Redistribution:	Collect the beetles from leafy spurge plants with a sweep net during the summer. The storage and shipping times are similar to those of other Aphthona spp. Frozen roots and soil containing overwintering larvae can be dug from the field and kept frozen. The beetles can then be reared at room temperature. Sprinkle beetles in moderately dense leafy spurge infestations. Areas of high ant activity should be avoided.
COMMENTS	
Consumption of the Aphthona spp. Larvae and adults by generalist predators, particularly ants, has been reported anecdotally. No native of introduced parasitoids have been reported among A. Lacertosa populations in the Unites States Under optimal site conditions, Aphthona Lacertosa populations will, directly of indirectly, kill leafy spurge plants offer large area. As leafy spurge stem densities decline, the relative abundance of nontarget grasses and forbs will increase. Leafy spurge control over hundreds of acres has been reported from some locations in the western United States where A Lacertosa and A. czwalinae were released.	

Black Dot Leafy Spurge Flea Beetle
(Aphthona nigriscutis)

Neal Spencer

Neal Spencer

Photos From Montana State University Archives, Montana State University, www.invasive.org, Unless otherwise cited.

Black Dot Leafy Spurge Flea Beetle *(Apthona Nigriscutis)*	
Used In:	Yellowstone and Carbon Counties, Montana
Type Of Agent:	Insect: Beetle, flea beetle (Coleoptera: Chrysomelidae).
Native distribution:	Europe.
BIOLOGY	
Generations Per Year:	One.
Overwintering Stage:	Larval (within the spurge roots).
Egg Stage:	The eggs are laid on the stem of the plant near or below the soil surface.

Larval Stage:	Larvae can be found from July to early spring of the following year. After hatching, they burrow into the soil and begin feeding on small roots. Feeding continues throughout the summer until the onset of cold temperatures and dormancy.
Pupal Stage:	Pupation occurs within a soil cell from late spring to early summer.
Adult Stage:	Adults are in the field in late June, July, and August. They are 3 to 3.5 mm (0.12 to 0. 14 in) long, and brown or brownish with a black dot on the back behind the thorax at the leading edge of the wings.
EFFECT	
Destructive stage:	Adult and larval.
Plant species attacked:	Leafy spurge *(Euphorbia esula)* complex.
Site of attack:	Adult beetles feed on the leaves and flowers while larvae feed on the root hairs and young roots.
Impact on the host:	Adult feeding on the foliage causes some injury, but larval feeding in and on the root hairs and young roots causes the greatest damage. The former reduces the plant's ability to make sugars for the root reserves, and the latter impairs the roots from taking up moisture and nutrients, thus reducing the potential plant height and retarding the flowering period. Higher concentrations of the beetles often reduce plant density, causing what often is referred to as "a hole in the spurge."
RELEASES	
First introduced into the United States:	1989, Montana
Now established in:	Colorado, Idaho, Montana, Nebraska, North Dakota, Oregon, and Washington.
Habitat:	It is believed that this insect prefers dry habitats such as sandy knolls. Peter Harris of Agriculture Canada recommends sites with needle-and-thread or porcupine grasses *(Stipa* spp.), flowering spurge stems of less than 70 cm (27 in) tall with fewer than 60 stems/m2 (10.7 stcms/ft2), and well-drained soils with less than 3% organic matter. This species prefers dry soils that are generally found on hilltops.
Availability:	Readily available in states where the insect populations have established.
Stage to transfer:	Adult.
Redistribution:	Collect the beetles with a sweep net from July through early August. The adult beetles can be shipped or stored for several days at cool temperatures if fed fresh leafy spurge leaves and confined in cardboard containers. They can also bc kept at room temperature for several weeks in large cages with fresh food, or for several weeks in smaller cardboard containers if kept cool and exercised and fed periodically under warmer conditions. To release, sprinkle beetles on moderately dense leafy spurge plants. Frozen roots and soil material containing overwintering larvae can be dug from the field and kept frozen until several weeks before adults are desired. The material can be removed from cool storage and warmed to ambient or room temperature. This will allow the beetles to mature and become adults. Sites for initial releases that contain high ant or grasshopper populations should be avoided.
COMMENTS	
Aphthona nigriscutis was first released in Canada in 1983 with spectacular results, and was the fourth flea beetle species cleared for release in the United States. Like many of the other flea beetle species that attack leafy spurge, this species tends to congregate for feeding, mating, and egg laying. Leafy spurge plant density is greatly diminished at first. However, roots that are not attacked (including the taproot) are able to send up new shoots to supply the sugars for root reserves. It is only through the persistence of the beetles over a long period of time in ecosystems that favor beetle survival that the lateral roots of leafy spurge will be destroyed, the taproots weakened, and the plants eliminated from the area.	

Brown Dot Leafy Spurge Flea Beetle
(Apthona cyparissiae)

USDA APHIS PPQ Archives

Neal Spencer

Photos From Montana State University Archives, Montana State University, www.invasive.org, Unless otherwise cited.

Brown Dot Leafy Spurge Flea Beetle *(Apthona Cyparissiae)*	
Used In:	Yellowstone County, Montana
Common Name:	Brown dot leafy spurge flea beetle.
Type Of Agent:	Insect: Beetle, flea beetle (Coleoptera: Chrysomelidac).
Native distribution:	Europe.
BIOLOGY	
Generations Per Year:	One.

Overwintering Stage:	Mature larval.
Egg Stage:	Eggs are generally laid on the lower stem next to the soil or on the soil next to the stem during July, August, and September. They hatch in about 13 days.
Larval Stage:	The larvae arc active from August until early spring. There arc three larval instars: the first lasts about eight days (under ideal conditions), the second lasts 25 to 30 days, and the final instar requires about 45 days. A cold period is needed to cause the mature larvae to pupate. The head is well sclerotizcd and subcompressed and the body is whitish in color.
Pupal Stage:	Pupation lasts about 20 days within a soil cell, from late spring to early summer.
Adult Stage:	Adult beetles are found on the leafy spurge plants from July until about September with many individuals surviving and laying eggs for three to four months. Adults are oval and brown and measure about 3.2 mm (0.13 in) long.
EFFECT	
Destructive stage:	Adult and larval.
Plant species attacked:	Leafy spurge *(Euphorbia esula)* complex, and especially cypress spurge *(E. cyparissias).*
Site of attack:	Adult beetles feed on the leafy spurge leaves and flowers while larvae feed on/in the root hairs and young roots.
Impact on the host:	Adult feeding on the foliage reduces the plant's photosynthetic production of sugars for the roots, while larval feeding on or in the root hairs and young roots reduces the plant's ability to take up moisture and nutrients. This decreases the height attained by the plant, delays the flowering period, and causes the plant to take its nourishment from the taproot. Over prolonged periods, continuous pressure by the beetles weakens the taproot resulting in the death of the plant. This species is effective in a specific ecological range.
RELEASES	
First introduced into the United States:	1987, Montana.
Now established in:	Colorado, Idaho, Iowa, Minnesota, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Washington, Wisconsin, and Wyoming.
Habitat:	Peter Harris of Agriculture Canada suggests that green needle grass *(Stipa viridula)* be present as an indicator, that flowering spurge stems be taller than 51 cm (20 in), that the density be between 50 and 125 stems/m2 (11.5 stems/ft2), and that the soils be 40 to 60% sand. These requisites are often found on dry alluvial fans. This flea beetle prefers warm, open, sunny areas and slightly more moist conditions than *A. nigriscutis.*
Availability:	Limited.
Stage to transfer:	Adult.
Redistribution:	Collect the beetles with a sweep net. After they are sorted, they can be shipped or stored on leaf material for several days if kept cool, or for several weeks under cool temperatures with intermittent warm feeding and exercise periods. To release, sprinkle beetles among moderately dense leafy spurge plants. Areas of high ant activity should be avoided. Frozen roots and soil removed from the field in the winter may be kept frozen until four to six weeks before the adults are desired. The beetles can then be reared at ambient or room temperature.
COMMENTS	
After this species is released, leafy spurge plant density is greatly reduced at first. However, roots that are not attacked (including the taproot) are able to send up small new shoots to supply the sugars for root reserves. It is only through the persistence of the beetle over a long period of time in ecosystems that favor beetle development that the lateral roots of leafy spurge will be destroyed, the taproots weakened, and the plants eliminated from the area. Eric Maw of Canada covers several species *of Aphthona* in his master's thesis at the University of Alberta and provides excellent descriptions of the larval and pupal stages of A. *cyparissiae, A. czwalinae,* and *A.flava.* He considers *A. cyparissiae* to have the greatest potential as an agent for control of perennial spurges. Its long developmental period may preclude its use in regions with short growing seasons. The type of damage inflicted may limit its efficacy at sites where other stresses on the plant are minor. Host preference in Europe seems to be for *Euphorbia cyparissias, E. esula, E. seguieriana,* and E. *virgata,* in that order. Most collections have been made in moist to dry areas with sandy to sand-gravel soils and sparse vegetation. Like many of the other flea beetle species that attack leafy spurge, *A. cyparissiae* tends to congregate for feeding, mating, and egg-laying.	

Red-headed Leafy Spurge Stem Boring Weevil
(Oberea erythrocephala)

Norman E. Rees

Norman E. Rees

Photos From Montana State University Archives, Montana State University, www.invasive.org, Unless otherwise cited.

Red-headed Leafy Spurge Stem Boring Weevil *(Oberea erythrocephala)*	
Used In:	Yellowstone County, Montana
Common Name:	Redheaded leafy spurge stem borer.
Type Of Agent:	Insect: Beetle (Colcoptera: Cerambycidae).
Native distribution:	Europe. Original sources: Europe, Italy, and Switzerland.
BIOLOGY	

Generations Per Year:	One, with some generations lasting two years in harsher climates.
Overwintering Stage:	Larval (within the stem or Crown).
Egg Stage:	Eggs are deposited from the end of June to mid-July. The female adult often girdles the upper part of the stem one to four times (usually twice) by cutting grooves completely or partly around it. She then gnaws a hole into the stem above the girdle marks and deposits an egg into it. The hole is generally covered with latex, which eventually dries. Usually only one egg is deposited in each shoot, although each female can produce about 60 eggs. The eggs are 1.8 to 2.0 mm (0.07 to 0.08 in) long, pale yellow at first but changing to pinkish-white or pink shortly before the larvae hatch.
Larval Stage:	The larvae hatch seven to 10 days after oviposition and begin to feed immediately on the pith. In thicker stems they begin to tunnel downward at once, while in thinner stems they tunnel upward first and then down. In Montana, stem diameters of at least 3.0 mm (0.12 in) are usually selected by the females for egg laying. The first three to four larval instars consume all the pith of the stem leaving only the cortical tissue, and fill their galleries with fibrous frass. The mined stems wilt and dry up by the end of July and so do not produce flowers and seeds. Regardless of the length of time required to complete development, the larvae remain in the crown of the plant during the winter. Only a single larva develops per stem; if several larvae occupy the same stem, the maturer larva will survive at the expense of the younger. In well-developed roots of large plants with several attacked stems, several larvae can complete their development. The whitish larvae are long and slender, and have sclerotized heads.
Pupal Stage:	Prior to pupation, the mature larvae mine the root crown and prepare pupal cells just above ground level. Pupation occurs during May.
Adult Stage:	Males emerge several days before the females. Both sexes are sexually immature for two weeks. The grayish-black, red-headed adults are 6 to 14 mm (0.24 to 0.56 in) long and very slender. The female's antennae are a little shorter than the male's.
EFFECT	
Destructive stage:	Adult feeding on the leaves and stems does not greatly affect plant survival. However, girdling by the adult with subsequent egg laying generally results in shoot death. The larvae in the stem also cause the stem to die, and destructive feeding in the crown and root greatly reduces the plant's root reserves.
Plant species attacked:	Leafy spurge *(Euphorbia esula* complex).
Site of attack:	Larvae live and feed in the stem and crown or plants with stein diameters in excess of 3.0 mm (0.12 in).
Impact on the host:	Although this agent has the potential to greatly depress leafy spurge populations, it attacks only specific biotypes of leafy spurge and, therefore, has not yet increased its population sufficiently in many areas to be effective.
RELEASES	
First introduced into the United States:	1982, Montana.
Now established in:	Montana, North Dakota, and Oregon.
Habitat:	This species seems to prefer areas with trees, and has established and increased best in riparian areas.
Availability:	Somewhat limited at present except for one Montana county.
Stage to transfer:	Adult.
Redistribution:	Use a sweep net or hand-collect the adults. These can be stored up to several weeks if kept cool and allowed to warm up, exercise, and feed for two-hour periods, three times per week. They can be shipped in a cool environment with plant stems and leaves for food. However, shipments should take no longer than six days.
COMMENTS	
This species can be confused with a flower beetle that has the same general coloration and appearance, except the flower beetle's head is slightly larger and black, and the abdomen is larger and much more flattened. This was the second insect species introduced to control leafy spurge. There is some indication that in some Montana locations the life cycle tends to require two years rather than just one, probably because of the cooler temperatures. It appears that this species is very host-specific and apparently prefers certain leafy spurge bio-types over others.	

Lesser Knapweed Flower Weevil
(Larinus minutis)

USDA ARS Archives

USDA ARS Archives

USDA ARS Archives

Bob Nowierski

Photos From Montana State University Archives, Montana State University, www.invasive.org, Unless otherwise cited.

Lesser Knapweed Flower Weevil *(Larinus minutis)*	
Used In:	Yellowstone and Park Counties, Montana
Common Name:	Lesser knapweed flower weevil.
Type Of Agent:	Insect: Beetle, weevil (Co-leoptera: Curculionidae).
Native distribution:	Bulgaria, Greece, Israel, Turkey, Romania, the southern part of the former European USSR, and the Caucasus.
BIOLOGY	
Generations Per Year:	One.

Overwintering Stage:	Adult (in plant litter at the base of the plants).
Egg Stage:	Eggs are deposited between June and September, depending on climate, in the capitulum between the pappus hairs. Up to five eggs are clustered; the number of eggs laid per female ranges between 28 and 130. The elongate, yellow eggs are 1.5 mm (0.06 in) long and hatch about three days after being laid.
Larval Stage:	There are three larval instars. The newly closed first-instar larvae feed on the pappus hairs and then move downward to] the achenes where they consume the contents of individual seeds as well as some nearby seeds and the receptacle. Feeding lasts about four weeks.
Pupal Stage:	This weevil constructs a cocoon (partly from seed coats) which is attached to the receptacle. Pupae are white but turn brown shortly before emergence.
Adult Stage:	Adults are active in the field fronl May or June until August. In the laboratory they will live up to 14 weeks. Mating occurs continuously in the field over a period of 11 weeks from early June until August. Adults normally feed on the leaves and flowers prior to laying eggs. Adults emerge from mid-July to mid-August. Larinus minutus adults are 4 to 5 mln (0.16 to 0.2 in) long, black, and have a large snout.
EFFECT	
Destructive stage:	Larval and adult.
Plant species attacked:	In Europe, Larinus minutus prefers diffuse knapweed (Centaurea diffusa), but also attacks spotted knapweed (C. maculosa) and plants associated with the subgenera Acrolophus (C. arenaria) and Calcitrapa (C. calcitrapa and C iberica).
Site of attack:	Larvae begin feeding on the pappus hairs and then mine downward through the capitulum to the seeds which arc then consumed. Adults feed on rosette leaves in the spring and in flowers.
Impact on the host:	Feeding by the larvae reduces seed production. A single larva can destroy an entire diffuse knapweed seed head. One to several larvae can be present in a single seed head, the number dependent upon the size of the seed head and the knapweed species.
RELEASES	
First introduced into the United States:	1991, Montana.
Now established in:	Montana, Oregon, and Washington.
Habitat:	The beetle prefers hot and dry areas.
Availability:	Limited availability; some in Oregon and Washington.
Stage to transfer:	Adult, and larval and pupal (in the seed heads).
Redistribution:	Collect and transfer the seed heads, or use a sweep net during flowering to collect the adults. When they congregate around the root crown, adults can be collected with an aspirator.
COMMENTS	
The larvae are aggressive and will kill one another or other insects in the same seed head.	

Defoliating Hemlock Moth
(Agonopterix alstroemeriana)

Eric Coombs

Eric Coombs

Eric Coombs

Photos From Montana State University Archives, Montana State University, www.invasive.org, Unless otherwise cited.

Defoliating Hemlock Moth *(Agonopteris alstroemeriana)*	
Used In:	Yellowstone County, Montana
Common Name:	Hemlock moth.
Type Of Agent:	Insect: Moth (Lepidoptera: Oecophoridae)
Native distribution:	Morocco, Europe, and east to Siberia
BIOLOGY	
Generations Per Year:	One.
Overwintering Stage:	Adult.

Egg Stage:	Females affix oval, slightly flattened, pale yellow eggs to the undersurfaces of leaves during late April and May. A female lays approximately 200 eggs over a three-week period. Eggs hatch in six days.
Larval Stage:	First-instar larvae chew irregularly shaped holes through leaf tissues. Second to fifth instars are leaf rollers and consume leaves as well as flowers, developing inflorescences, immature seeds, and stem tissues. When disturbed, larvae wriggled wildly and often drop from the plant. Larval development is completed in 24 days. Larvae are light green with blackish-brown head and are 10 mm (0.4 in) long at maturity
Pupal Stage:	The reddish-brown pupae are 7 to 8 mm (0.28 to 0.32 in) long. Pupation typically occurs within a cell formed in the soil. The plpal period lasts 15 days.
Adult Stage:	The 8 to 9 mm (0.32 to 0.36 in) adult is grayish-brown; each forewing is marked by a large black spot and an adjacent smaller, brick red spot near the middle of the wing. Overwintered adults resume activity during early to mid-April. The moths hide in soil litter and vegetation during the day and, when disturbed, make short [1.8 to 3.0 m (6 to 10 ft)] flights before alighting on foliage or the soil surface. First-generation adults appear during June and July and disperse during late summer and early fall before seeking overwintering sites.
EFFECT	
Destructive stage:	Larval.
Plant species attacked:	Poison-hemlock *(Conium maculatum)*.
Site of attack:	Leaves, inflorescences, and stems.
Impact on the host:	Injury is severe: plants are often completely defoliated by several hundred larvae per plant. Larval destruction of the inflorescences may prevent seed production. Damaged plants resemble those treated with phenoxy herbicides (ie. 2,4-D).
RELEASES	
First introduced into the United States:	1973, New York, Accidental Introduction
Now established in:	California, Colorado, Idaho, Montana, Nevada, New York, Oregon, Utah, and Washington.
Habitat:	Unknown
Availability:	The moth is collectible in large numbers where it is established.
Stage to transfer:	Adult and Larval.
Redistribution:	Because of its excellent reproductive and dispersal abilities, this moth already occurs in most poison-hemlock infested locations, so redistribution is often unnecessary. Adults can be collected with a sweep new, although this is not recommended because it is too labor intensive. It is much easier to collect and transfer older larvae. Clip heavily infested leaves, stems, and inflorescences and distribute with material among unattacked poison-hemlock. The caterpillars will quickly colonize the healthy plants.
COMMENTS	
Adults often overwinter beneath the bark of cut firewood. When this wood is brought into a warm dwelling, the moths soon become active and fly around within the residence. They are often mistakenly identified by homeowners as clothes moths.	

Musk Thistle Head Weevil
(Rhinocyllus conicus)

Loke T. Kok

USDA ARS Archives

Loke T. Kok

Loke T. Kok

Photos From Montana State University Archives, Montana State University, www.invasive.org, Unless otherwise cited.

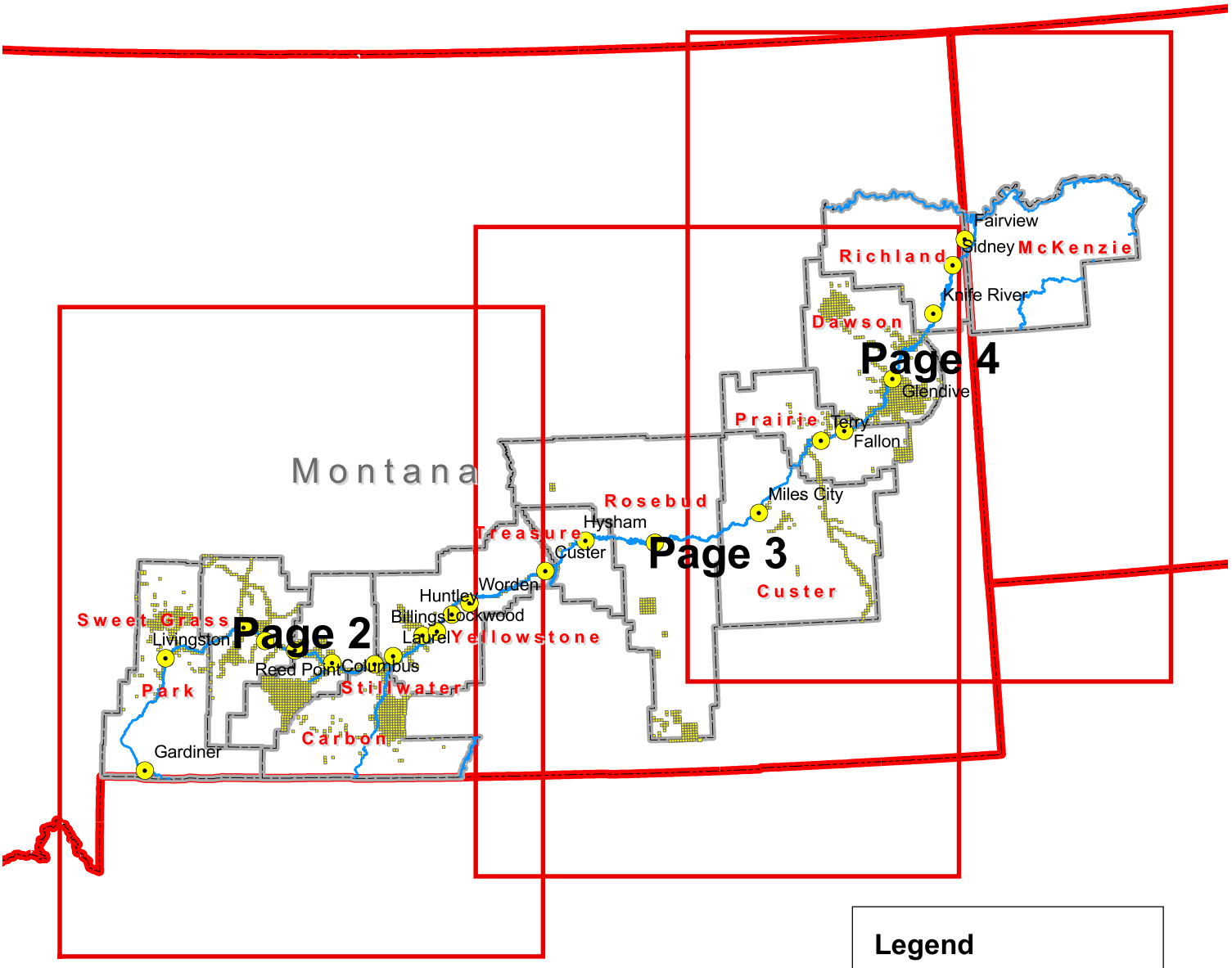
Musk Thistle Head Weevil *(Rhinocyllus conicus)*	
Used In:	Carbon County, Montana
Common Name:	Musk Thistle Head Weevil of Thistle Head Weevil
Type Of Agent:	Insect: Beetle, weevil
Native distribution:	Europe, western Asia, and North Africa.
BIOLOGY	
Generations Per Year:	One

Overwintering Stage:	Adult, in sheltered locations such as caves, the hollows of trees, or occasionally the attics of homes.
Egg Stage:	Each female will produce from 100 to 1250 eggs and generally deposits them on bud bracts (the modified leaves below the flower). The bracts of musk thistle are preferred locations, but when the bracts become saturated, the musk thistle stems receive the next largest amount of eggs. If other host thistle species are in the area, the insect will them move to them. In Montana, eggs are laid from mid-May to late June. Eggs are covered with chewed plant material which becomes tan with age and appears as warts on the buds and stems, thus protecting the eggs from predators. Eggs hatch six to eight days after being laid.
Larval Stage:	The larvae infest the seed head or stem from early June to fall. They develop for 25 to 40 days, feeding on the receptacle and maturing seed tissue. Each larva feeds within the chamber of cell it forms. The feeding stimulates the plant to concentrate nutrients and tissue in the affected area. The mature larvae eventually coat the inner cell walls with feces and chewed pant material to produce hard, protective chambers for the pupal stage. Larvae what tunnel into stems of musk thistle do not construct calls. Larvae are C-shaped, creamy-white, and have amber brown sclerotized heads.
Pupal Stage:	Pupation occurs within the plant tissue in which the larvae developed. The pupal stage lasts from eight to 14 days. Pupae are whitish to creamy-white.
Adult Stage:	Adult's remain with the cells for several weeks, turning from a cream or reddish tan to almost black. When weevils emerge from the plan, their body hair is a patchy mixture of black and yellow, which gives the impression that the weevils are covered with pollen. Weevils chew their way out of the seed heads through the face of the receptacle, whereas those in the stems exit through several small openings chewed near the attachment of the seed head. Adults are present for only a short period after emerging from the plants. They can occasionally be seen flying about on warm fall days. This weevil has a short snout, and although size is variable, larger weevils are no more than 5 to 6 mm (about 0.24 in long).
EFFECT	
Destructive stage:	Larval
Plant species attacked:	Plumeless Thistle, Welted Thistle, Musk Thistle, Italian Thistle, Slenderflower Thistle, Canada Thistle, Bull Thistle, Milk Thistle, Scotch Thistle. Will also sometimes attack Wavyleaf Thistle.
Site of attack:	Seed head and sometimes the stem. Adults may slightly defoliate plants.
Impact on the host:	Because the insects attacks the seed-producing tissue and because must thistle reproduces exclusively by seed, this weevil is extremely effective by itself in those areas where the plant and insect life cycles are synchronized. In those plant species that reproduce by other means, it only affects the seed production potential.
RELEASES	
First introduced into the United States:	1969, Montana, Virginia
Now established in:	The weevil is well0established in most northwestern and northern plains states.
Habitat:	Meadows and areas where there is adequate moisture and moderate temperatures are best for weevil, while very hot, dry areas greatly limit this insect's population. Areas where summer arrives quickly do not allow it to use secondary and later seed heads.
Availability:	Large numbers can be collected for redistribution during May and June from almost any established location.
Stage to transfer:	Adult.
Redistribution:	Collections should be made at the weevils gather on the plants early in the spring and begin to mate (May through June). Adults are dislodged onto a tarp, tabletop, or into a plastic bag for sorting. Beetles can then be stored or shipped for up to a week, especially if kept as 8 to 12° C (46 to 54° F). Insects can be stored or shipped in cardboard cartons with musk thistle leaves as food, if kept cool, for about a week.
COMMENTS	
This was the first species released for biocontrol of musk thistle in the United States. Experiments have shown that mortality of R. conicus. Is not significantly increased when the herbicide 2,4-D is sprayed on bolting and bolted musk thistle plants with developing larvae in the seed heads.	

Appendix C

Montana Section Based Inventory Project Atlas

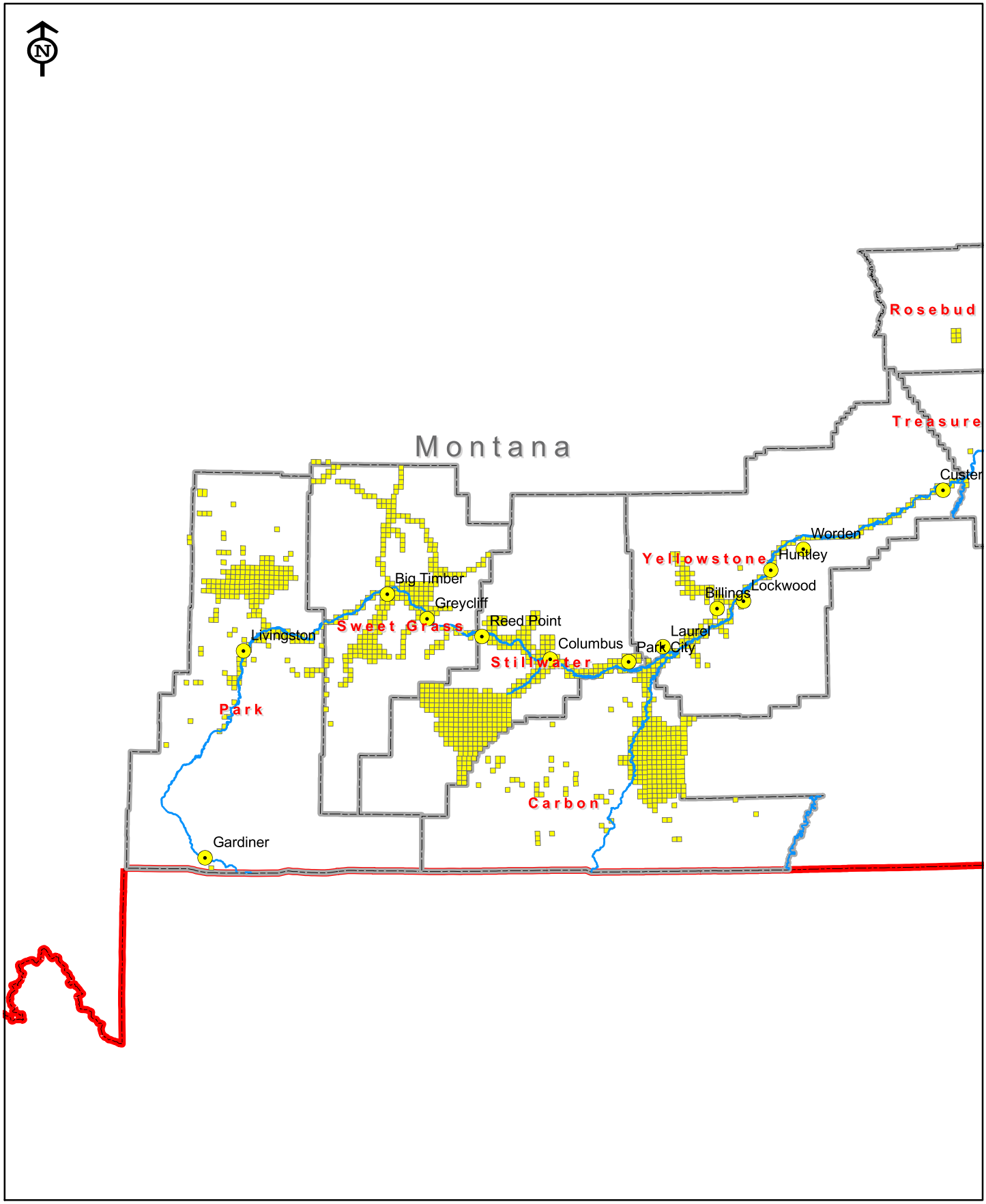
Montana Section Based Noxious Weed Mapping Data Leafy Spurge



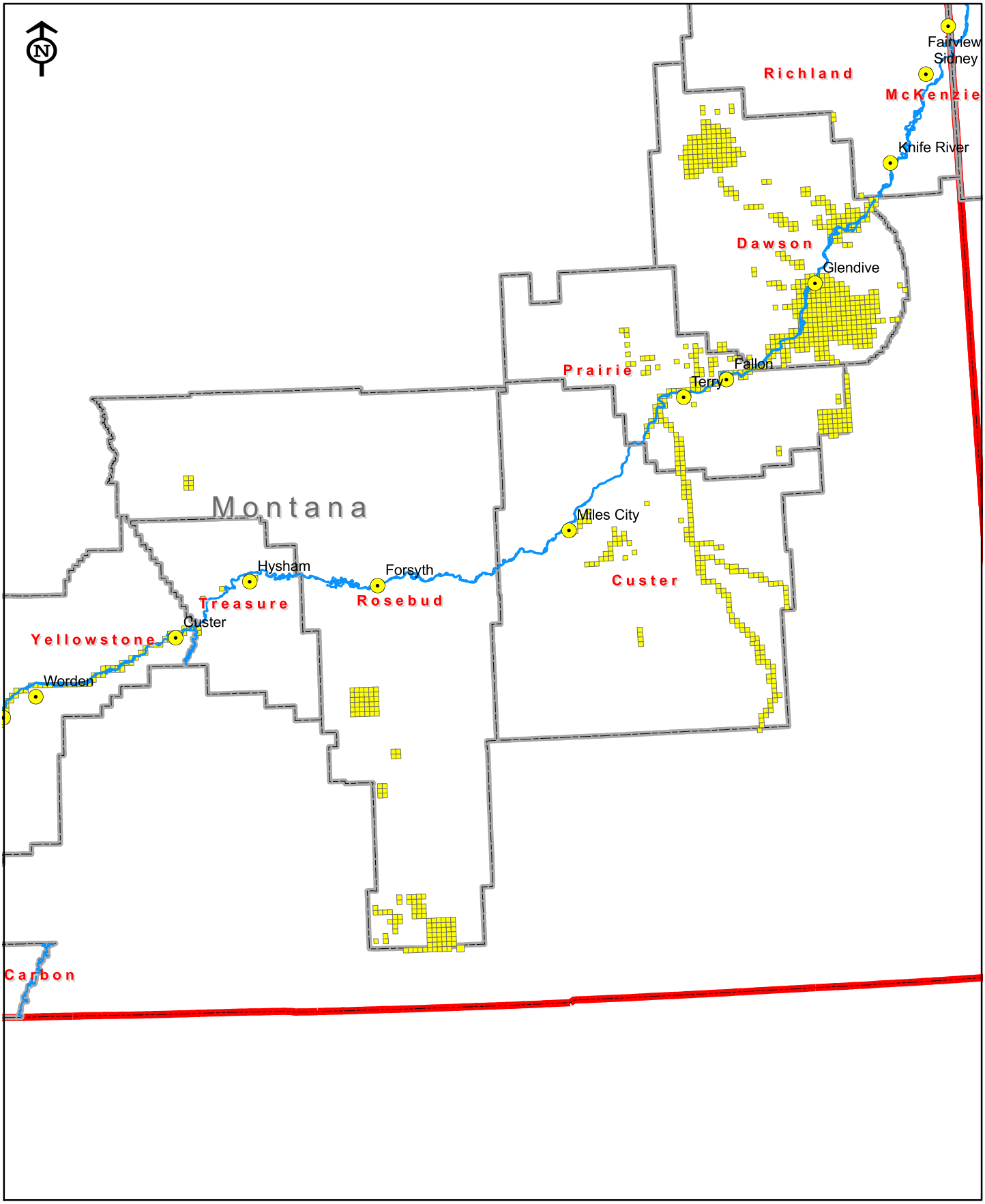
Legend

- Cities And Towns
- Rivers
- County Lines
- State Lines
- Leafy Spurge Present
- SectionBased Index

Hysham Enterprises

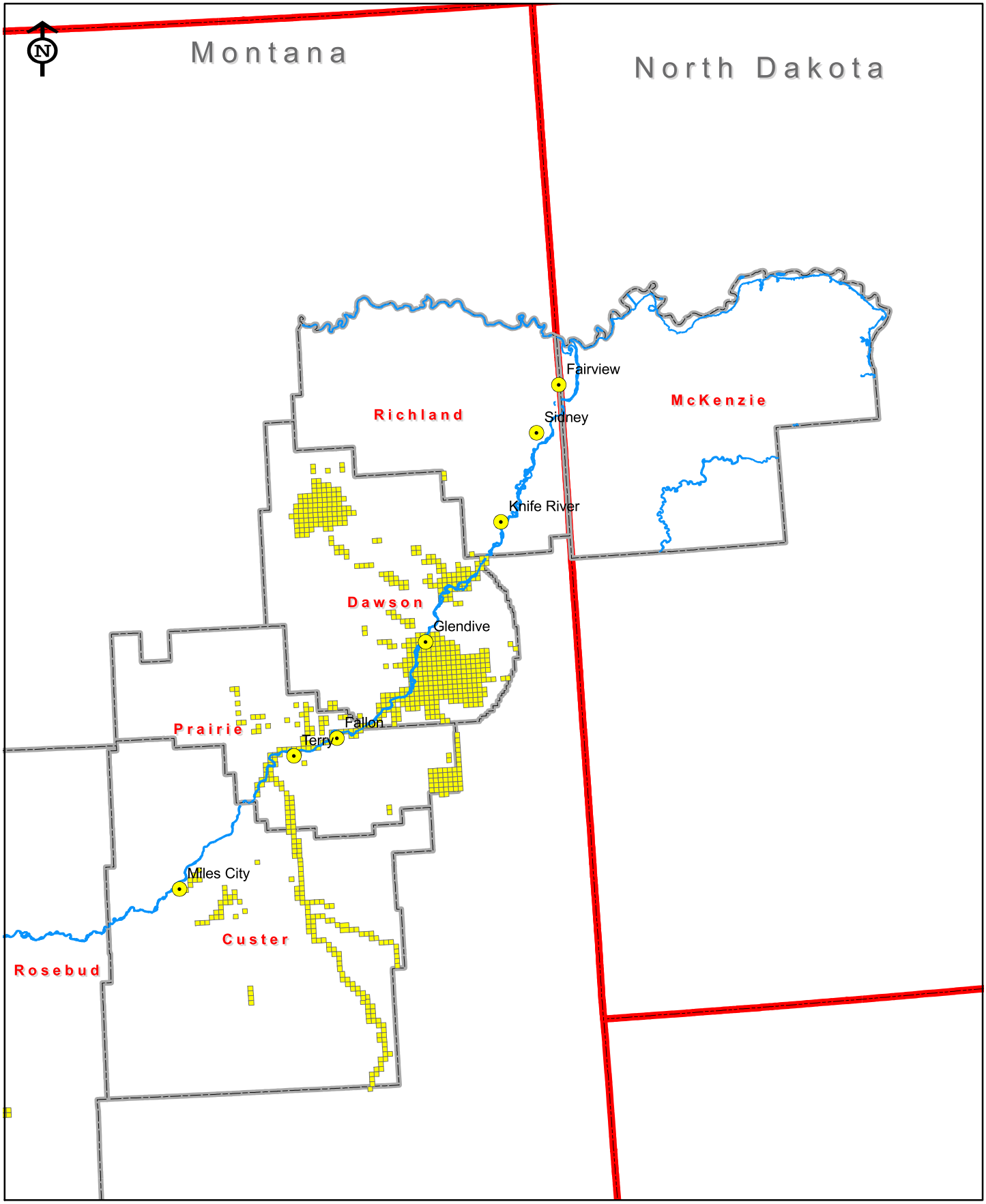


Montana Section Based
Noxious Weed Mapping Data
Leafy Spurge



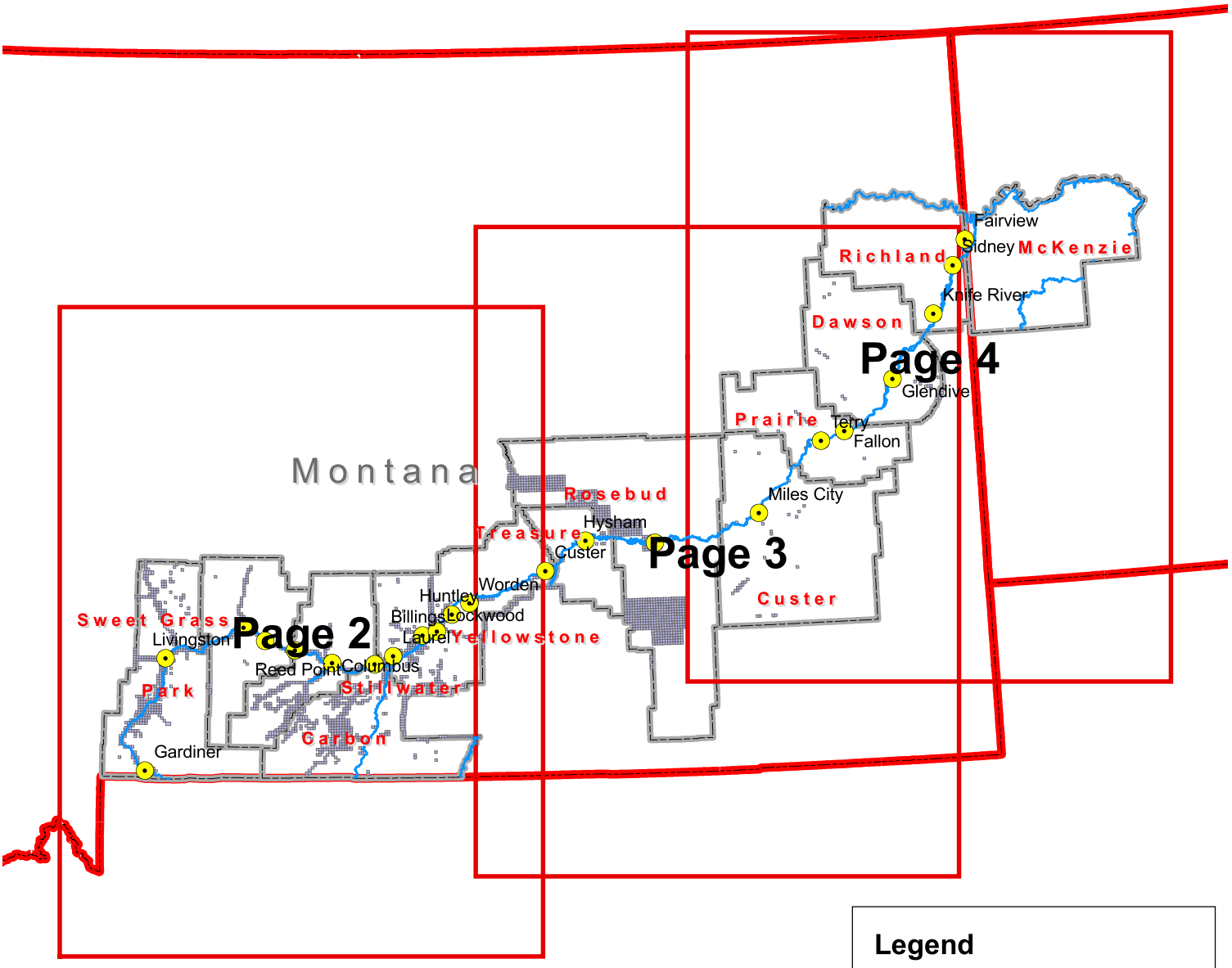
Hysham Enterprises

Montana Section Based
Noxious Weed Mapping Data
Leafy Spurge



Montana Section Based
Noxious Weed Mapping Data
Leafy Spurge

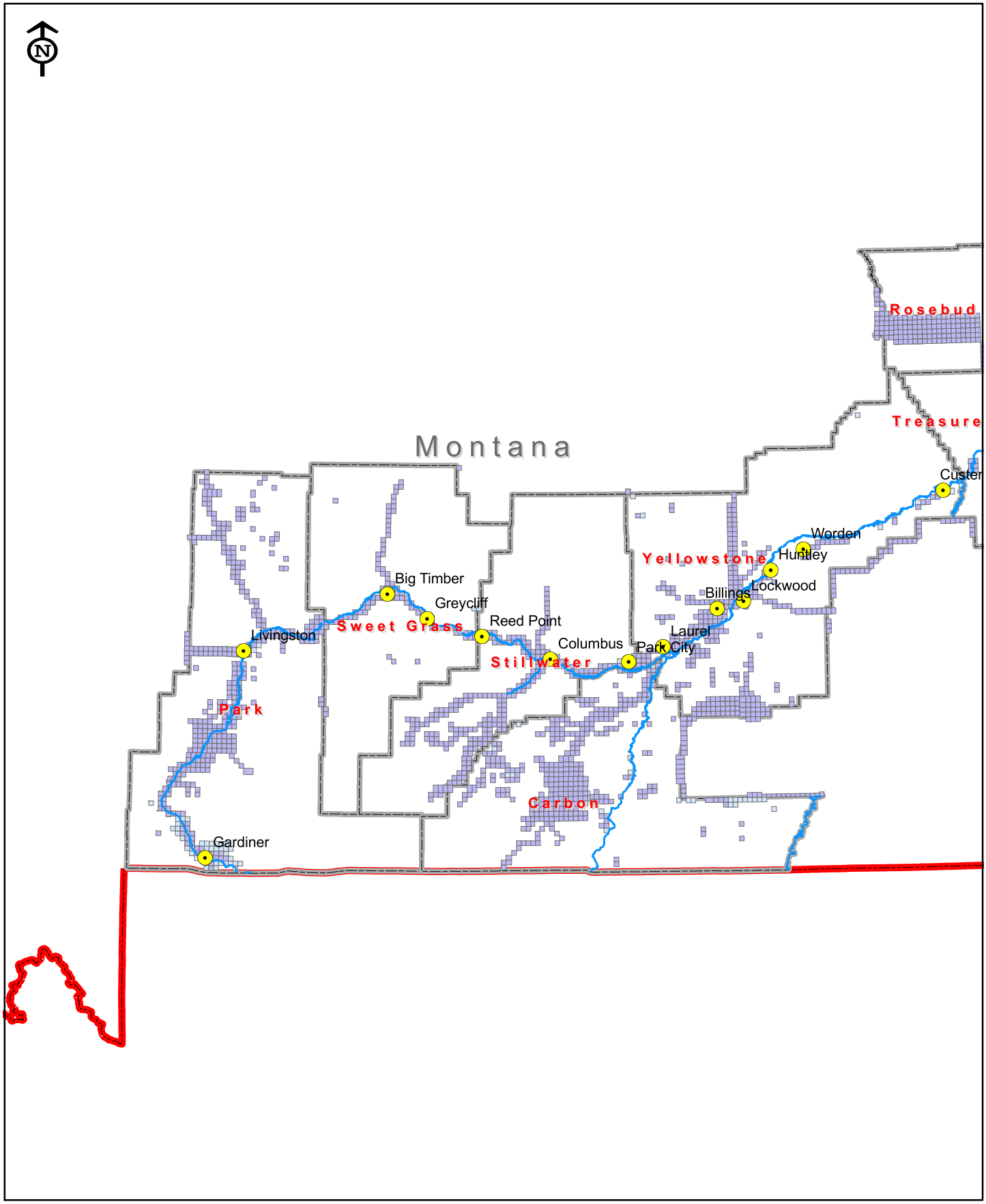
Montana Section Based Noxious Weed Mapping Data Spotted Knapweed



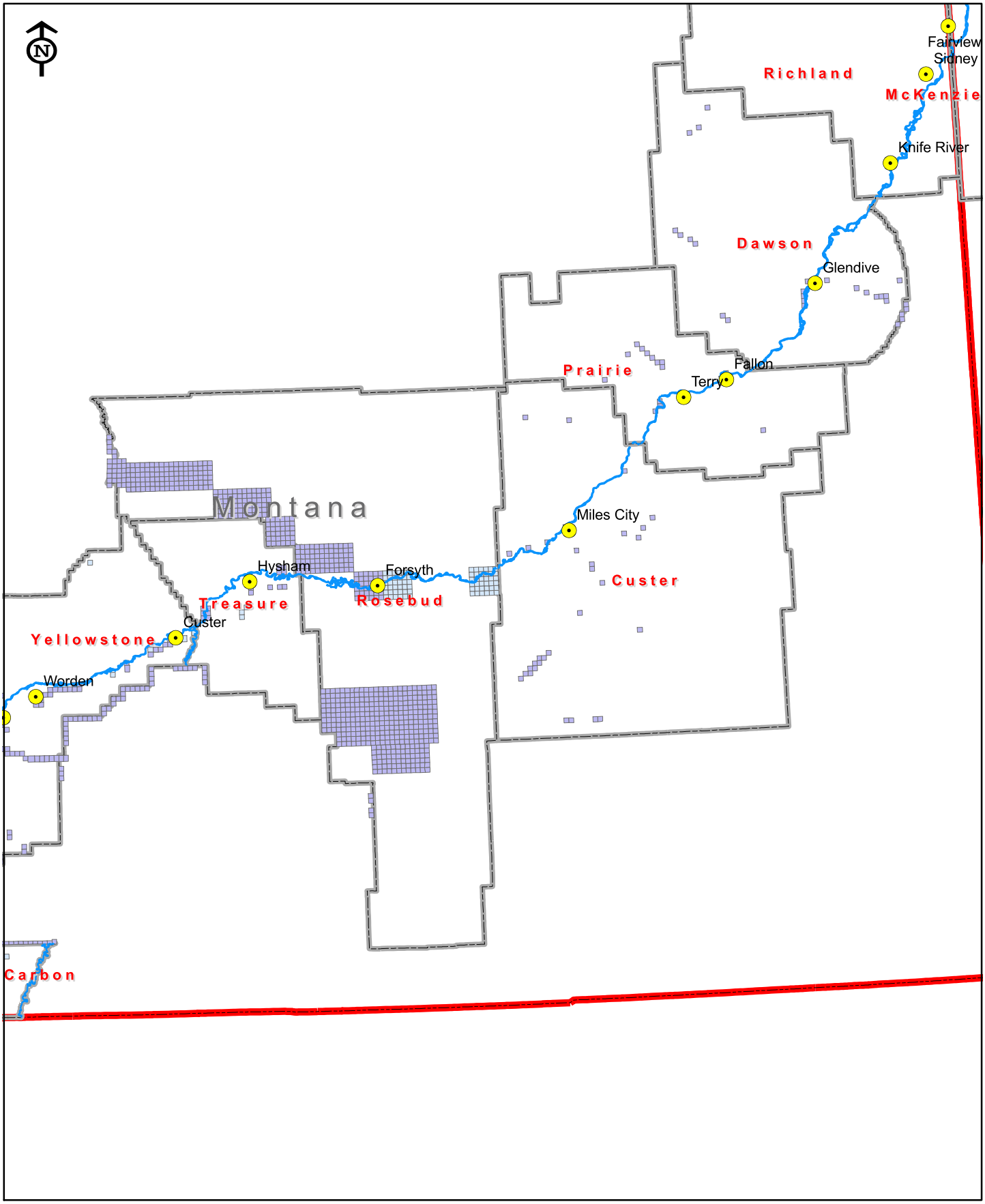
Legend

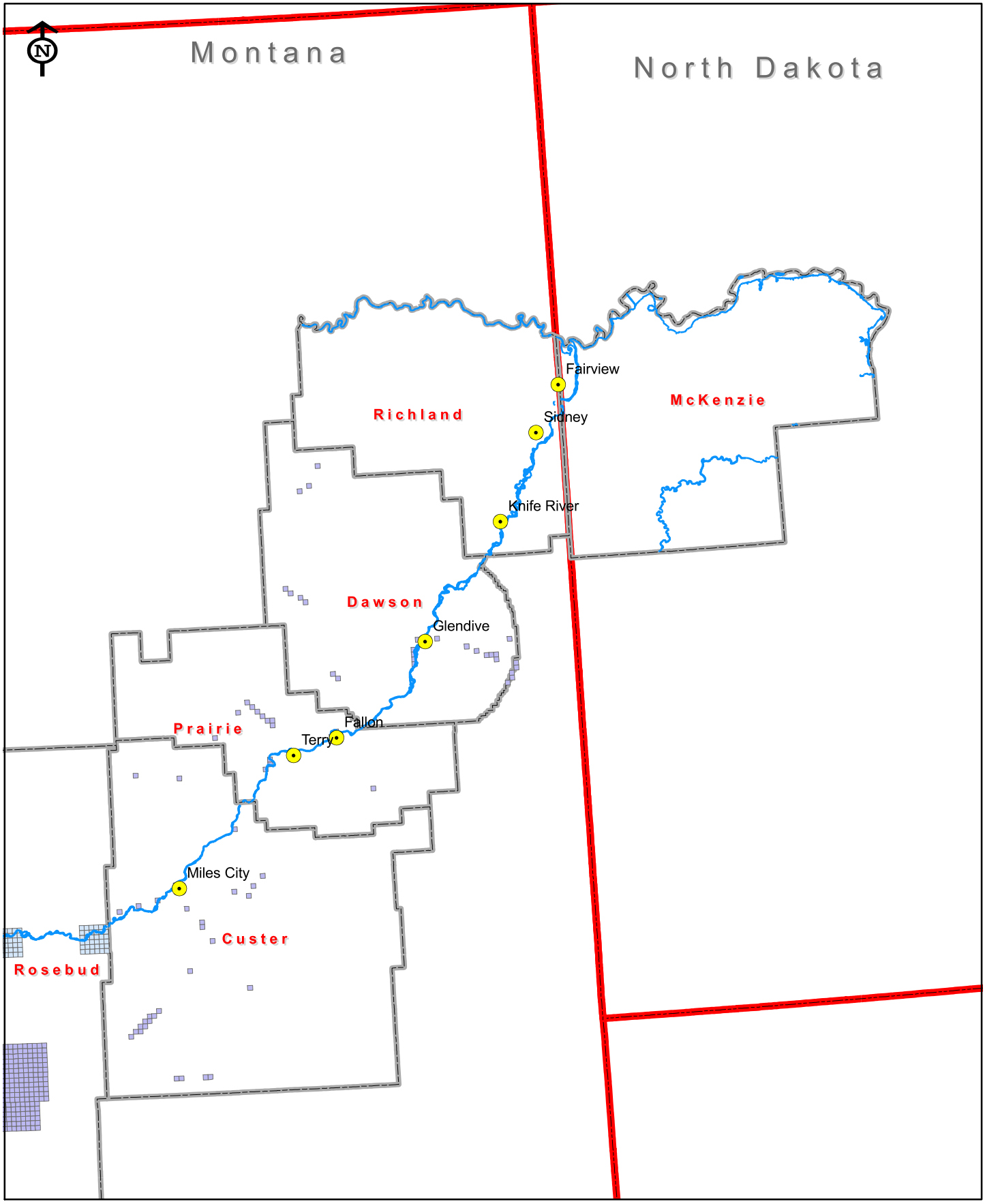
- Cities And Towns
- Rivers
- County Lines
- State Lines
- Spotted Knapweed Present
- SectionBased Index

Hysham Enterprises



Montana Section Based
Noxious Weed Mapping Data
Spotted Knapweed


Fairview
Sidney
Richland
McKenzie
Knife River
Dawson
Glendive
Prairie
Pallon
Terry
Montana
Miles City
Hysham
Forsyth
Custer
Treasure
Rosebud
Custer
Yellowstone
Worden
Carbon


Montana
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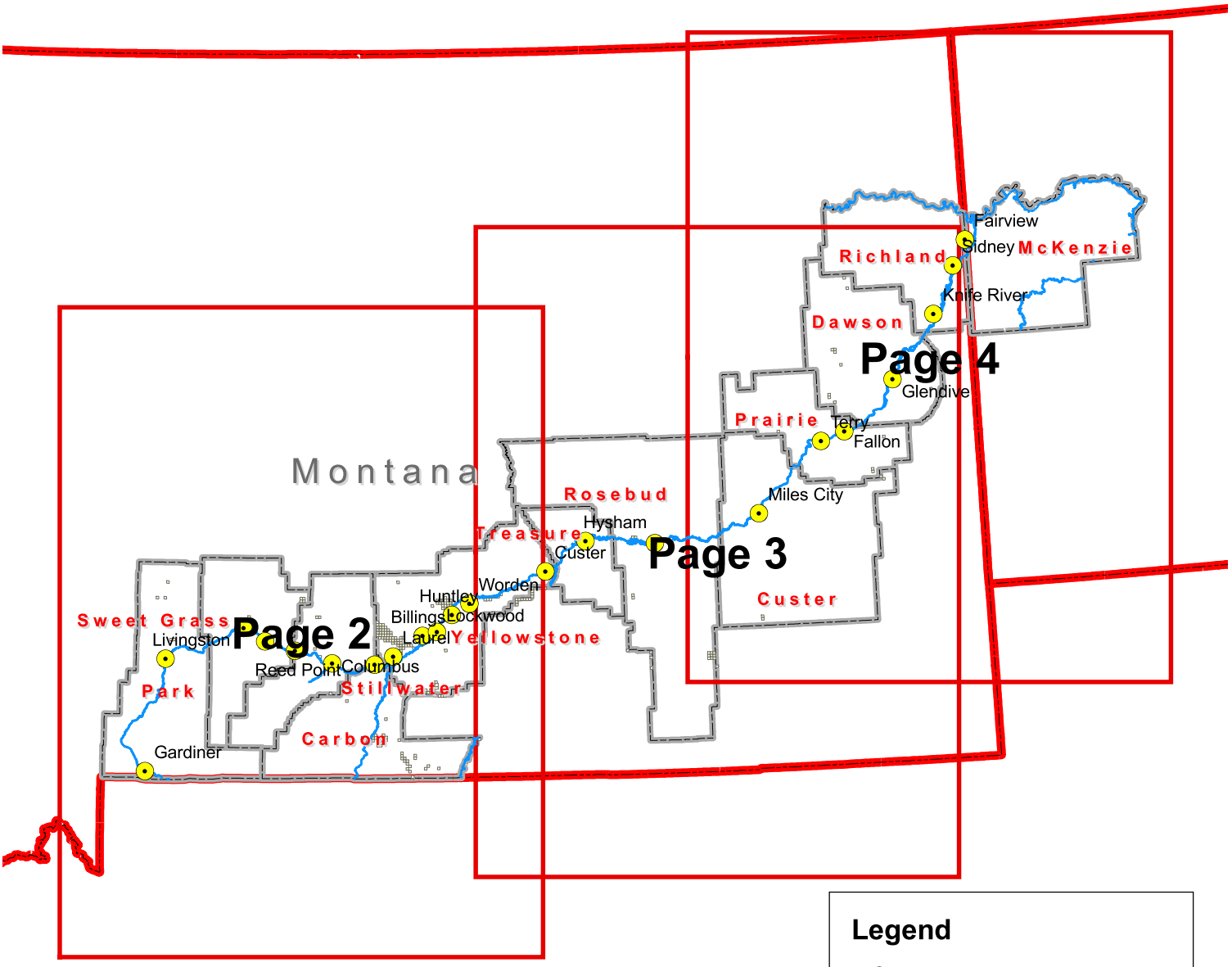
Fairview
Sidney
Knife River
Dawson
Glendive
Prairie
Fallon
Terry
Miles City
Custer
Rosebud

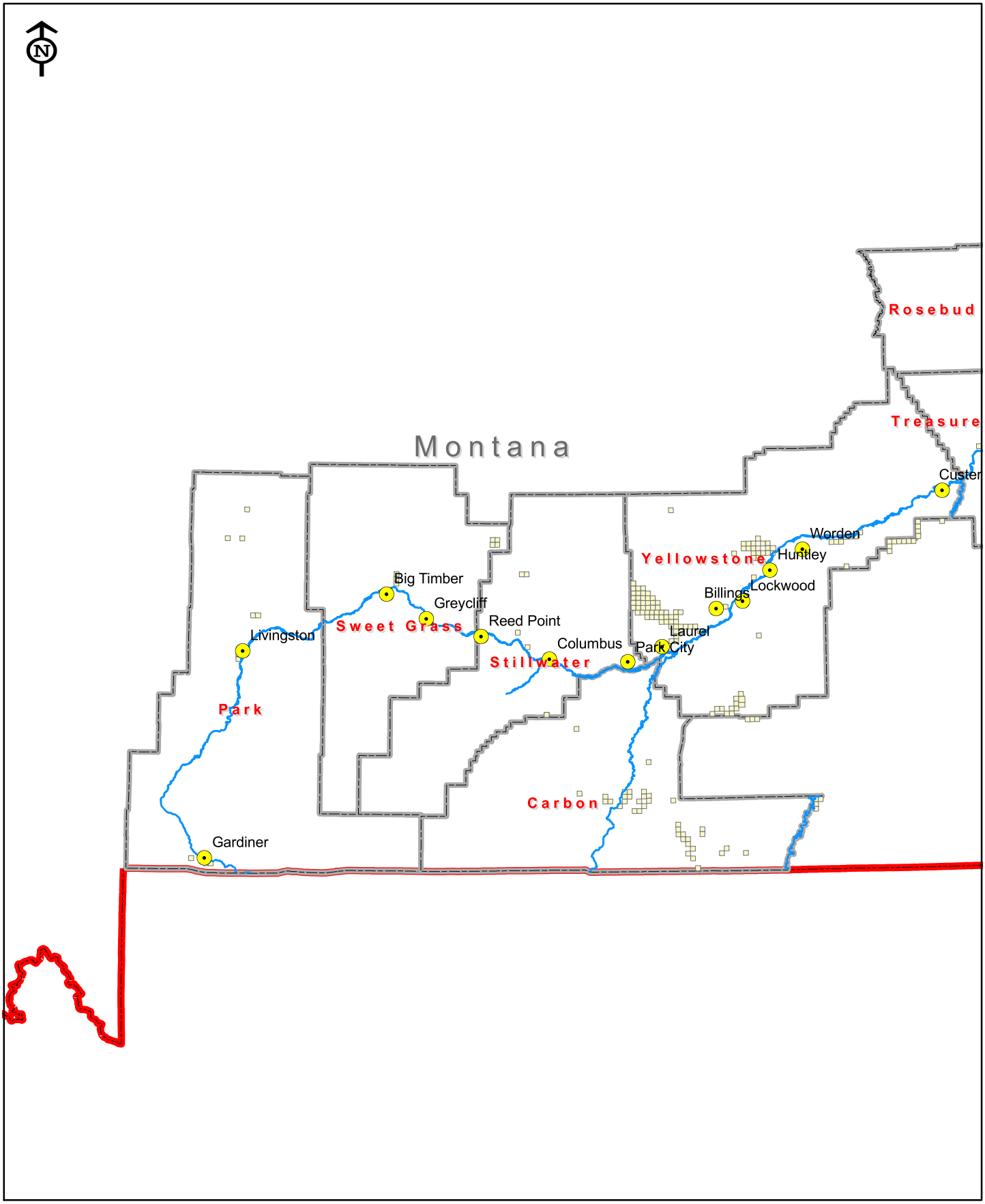
Montana Section Based Noxious Weed Mapping Data Russian Knapweed



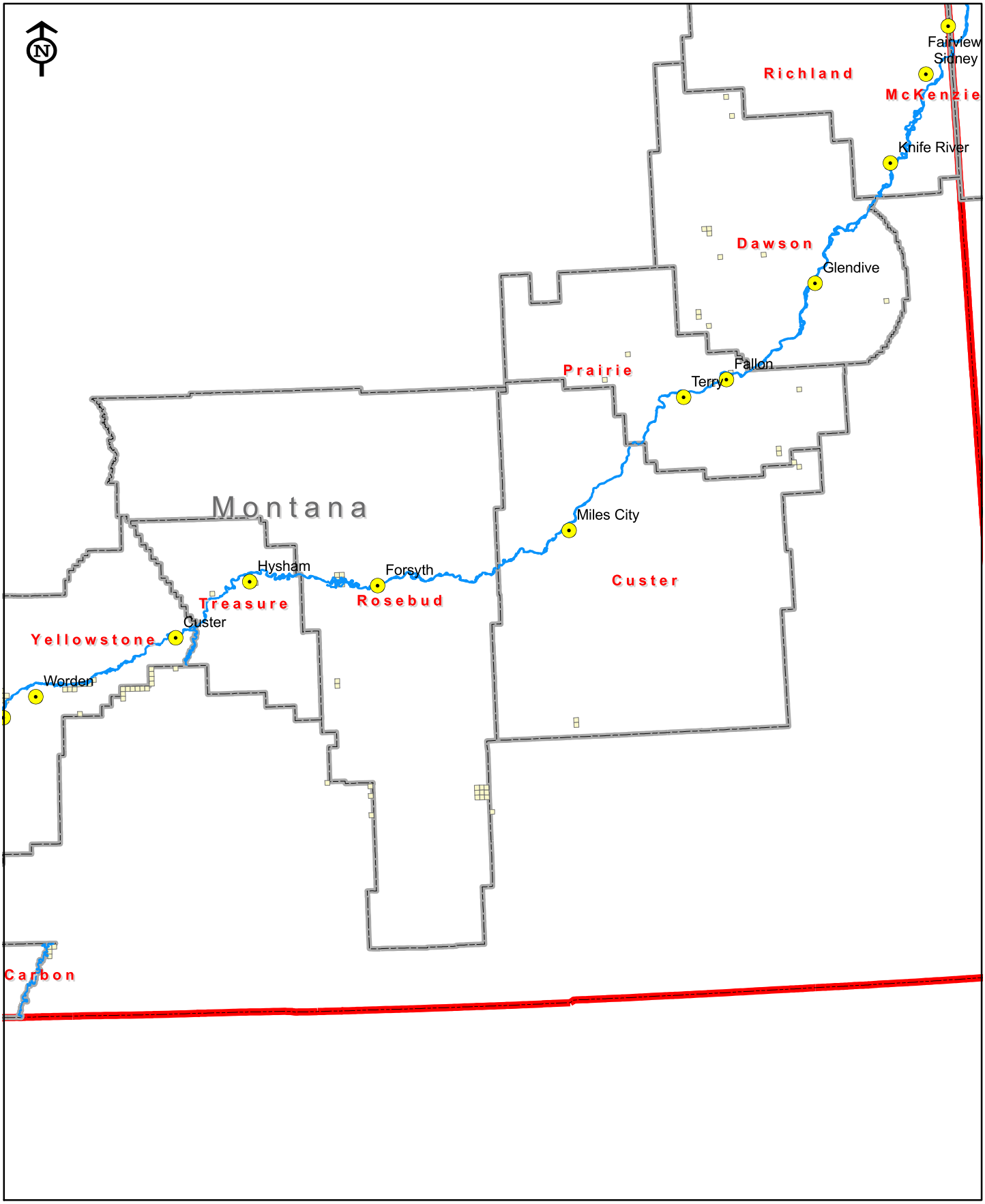
Legend

- Cities And Towns
- Rivers
- County Lines
- State Lines
- Russian Knapweed Present
- SectionBased Index

Hysham Enterprises



Montana Section Based
Noxious Weed Mapping Data
Russian Knapweed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Knife River
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Glendive
Prairie
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Miles City
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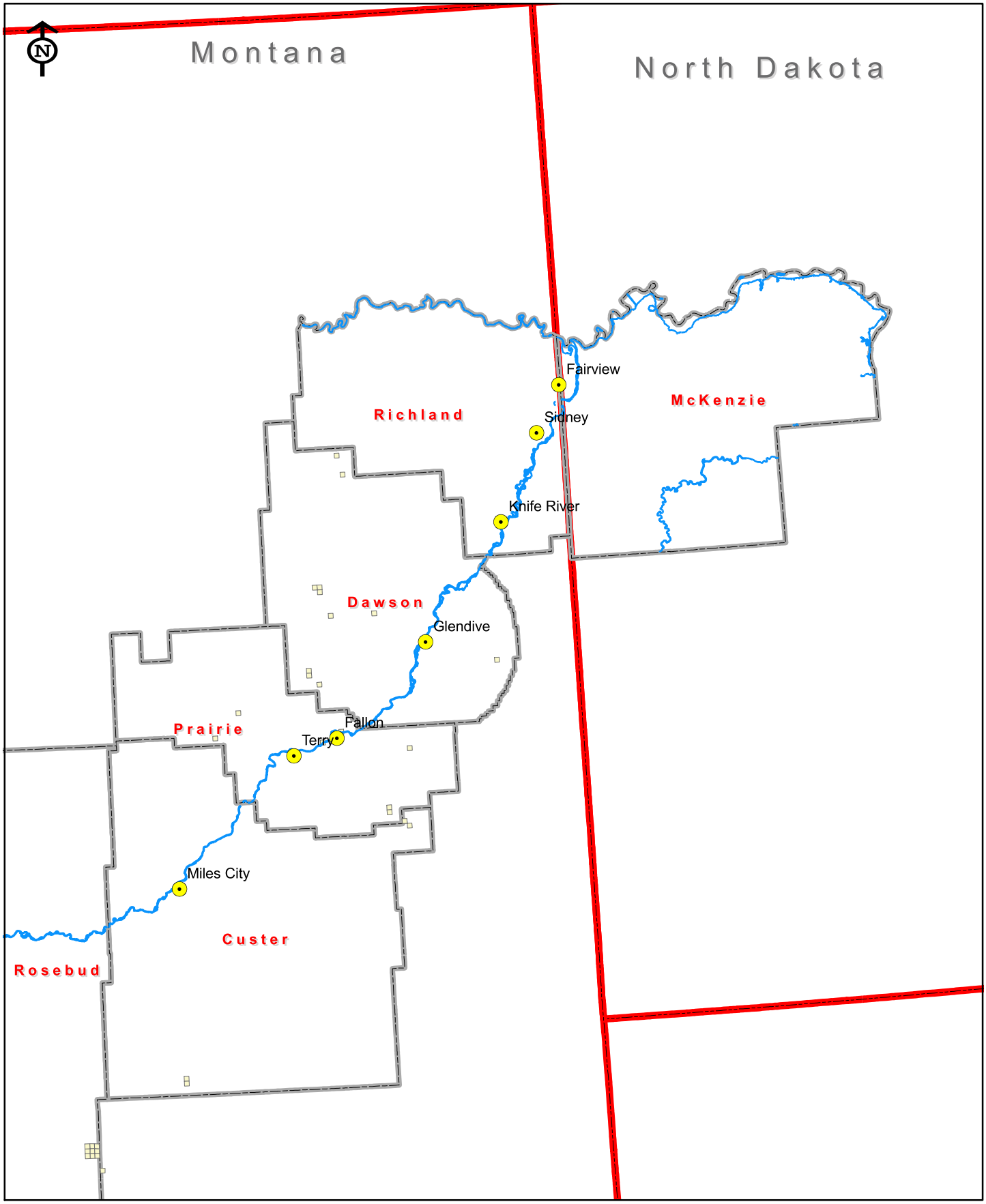
Forsyth
Treasure
Rosebud
Custer
Yellowstone
Worden
Carbon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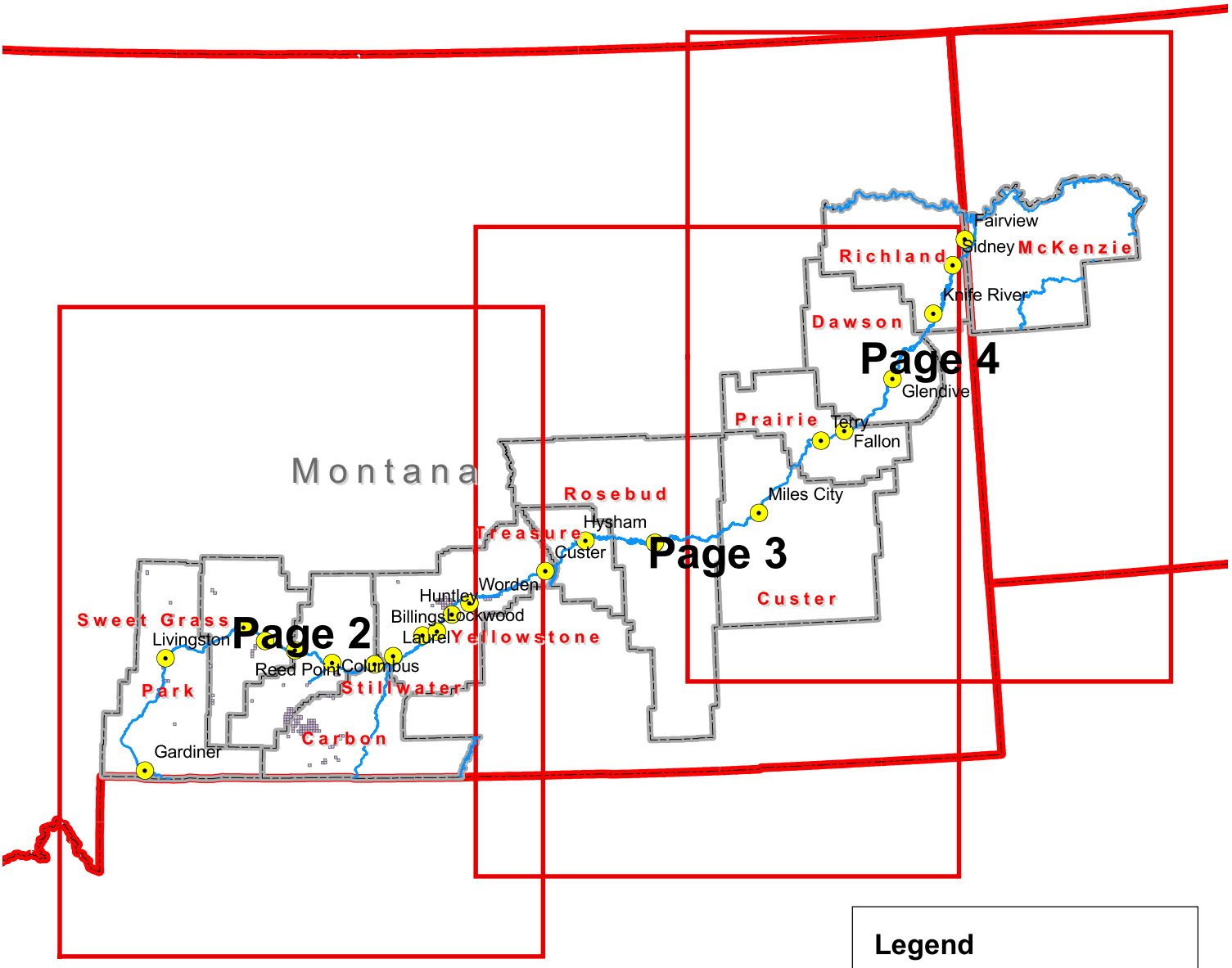
Fairview
Sidney
Knife River
Dawson
Glendive
Prairie
Fallon
Terry
Miles City
Custer
Rosebud

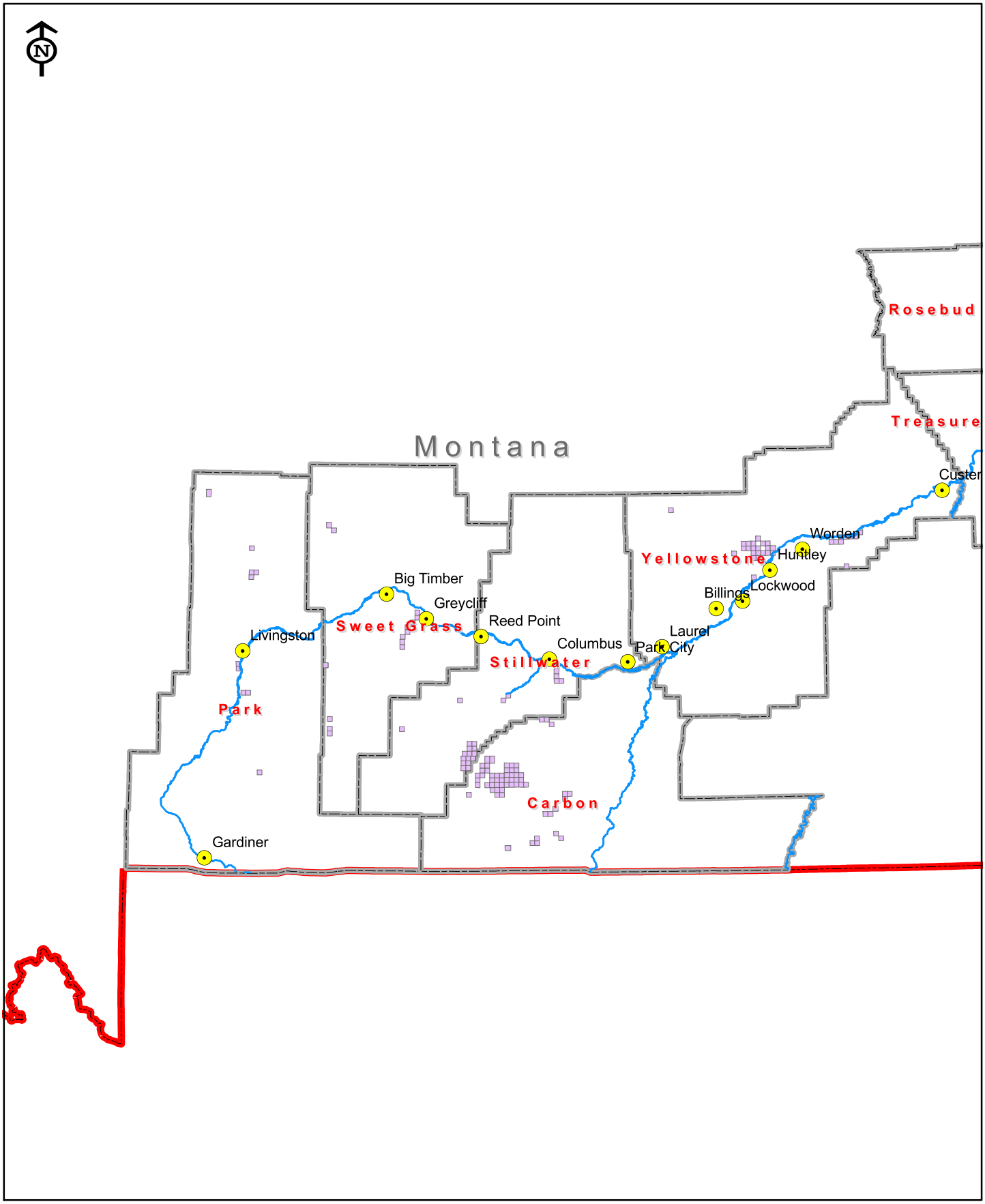
Montana Section Based Noxious Weed Mapping Data Sulfur Cinquefoil



Legend

- Cities And Towns
- Rivers
- County Lines
- State Lines
- Sulfur Cinquefoil Present
- SectionBased Index

Hysham Enterprises



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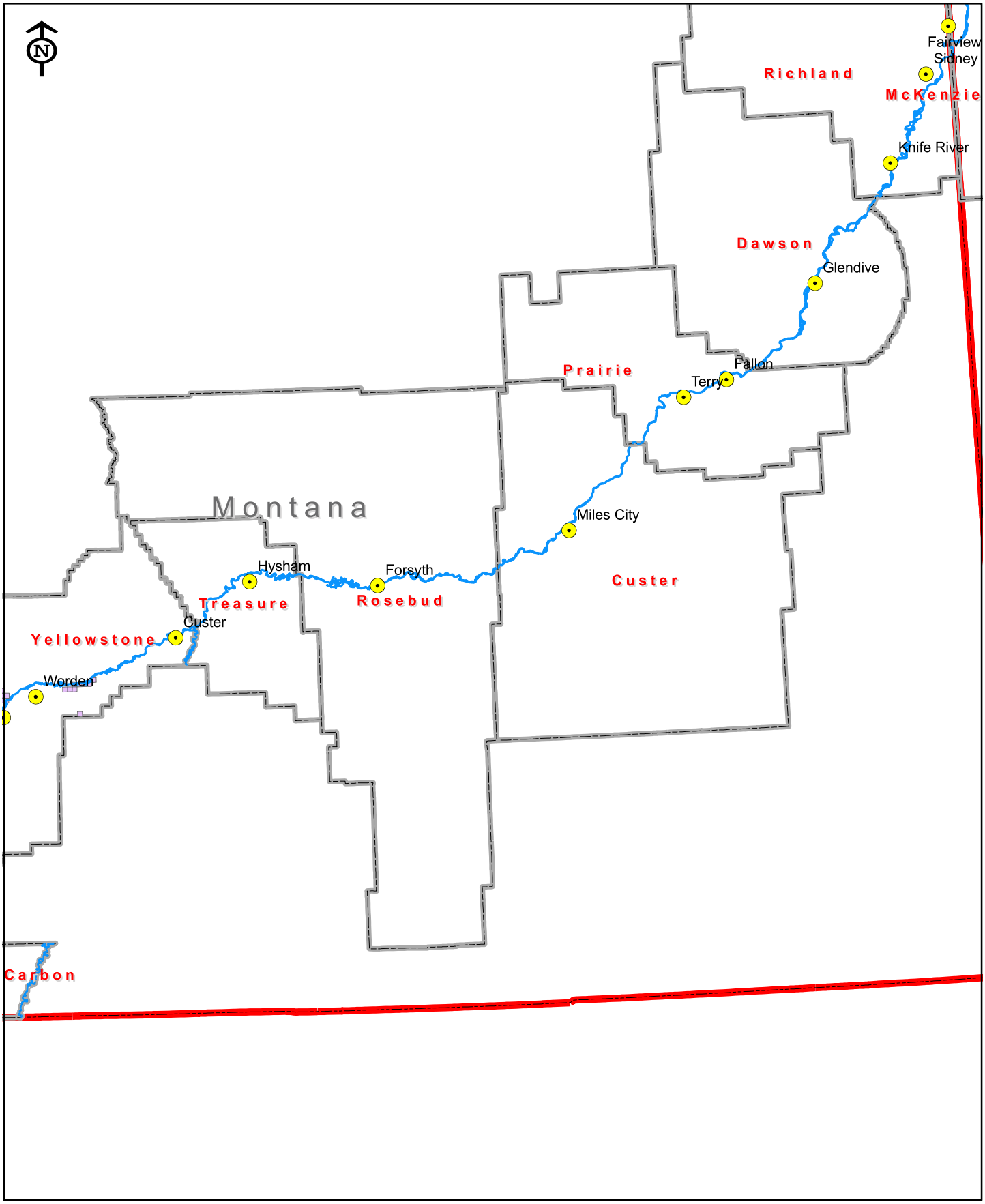
Noxious Weed Mapping Data
Sulfur Cinquefoil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McKenzie
Knife River
Dawson
Glendive
Prairie
Pallon
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Custer
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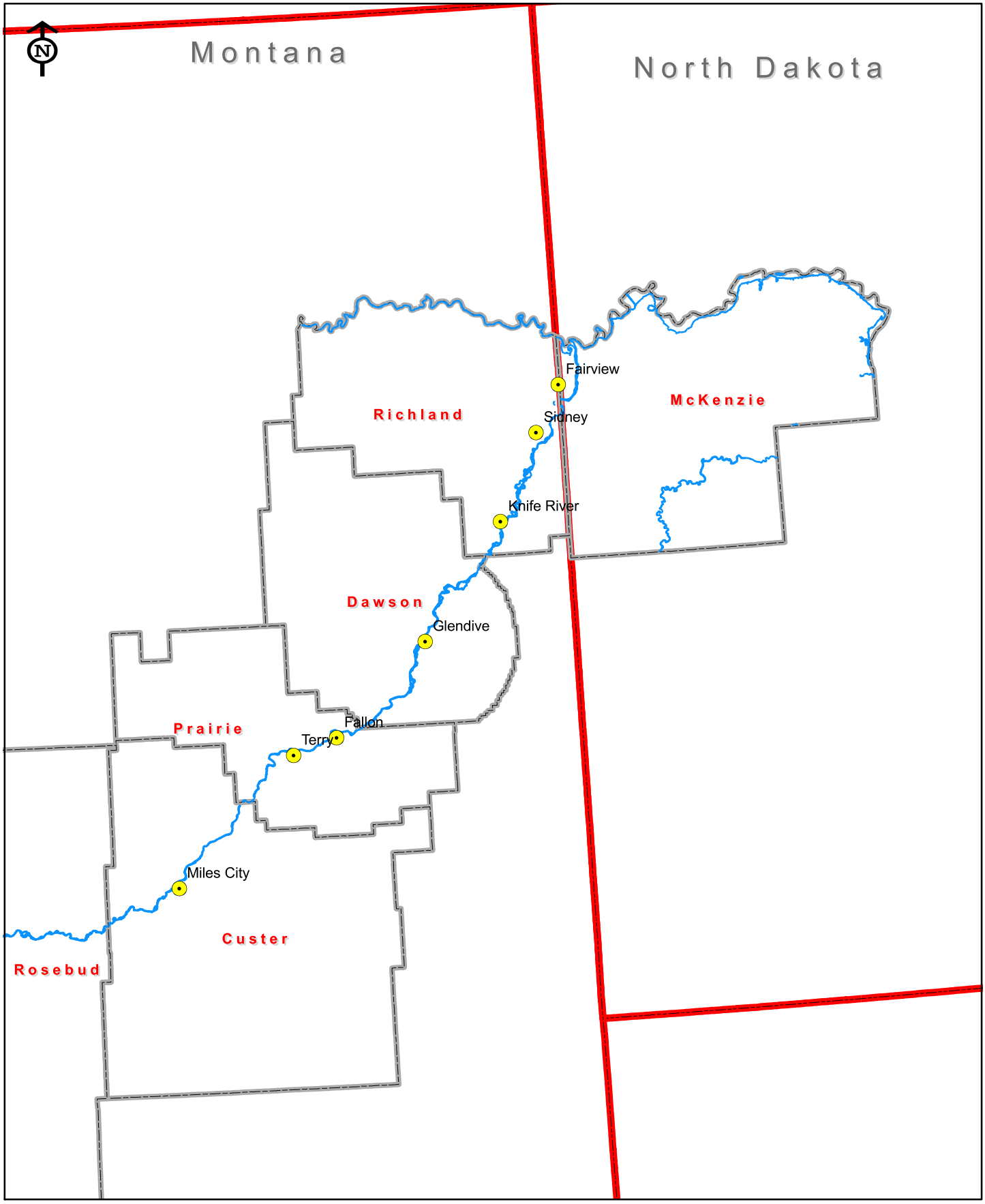
Forsyth
Treasure
Rosebud
Custer
Yellowstone
Worden
Carbon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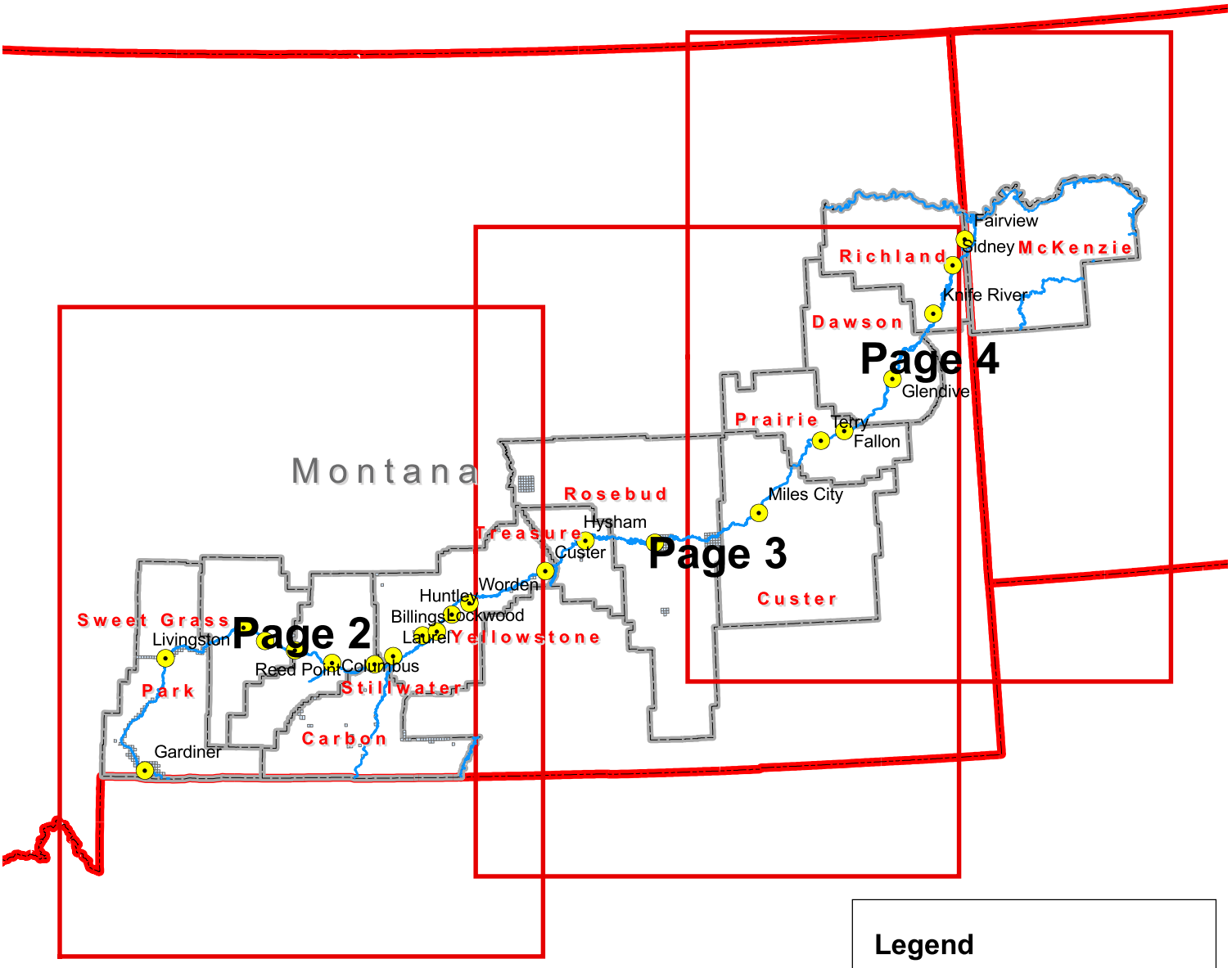
North Dakota
Richland
McKenzie
Fairview
Sidney
Knife River
Dawson
Glendive
Prairie
Fallon
Terry
Miles City
Custer
Rosebud

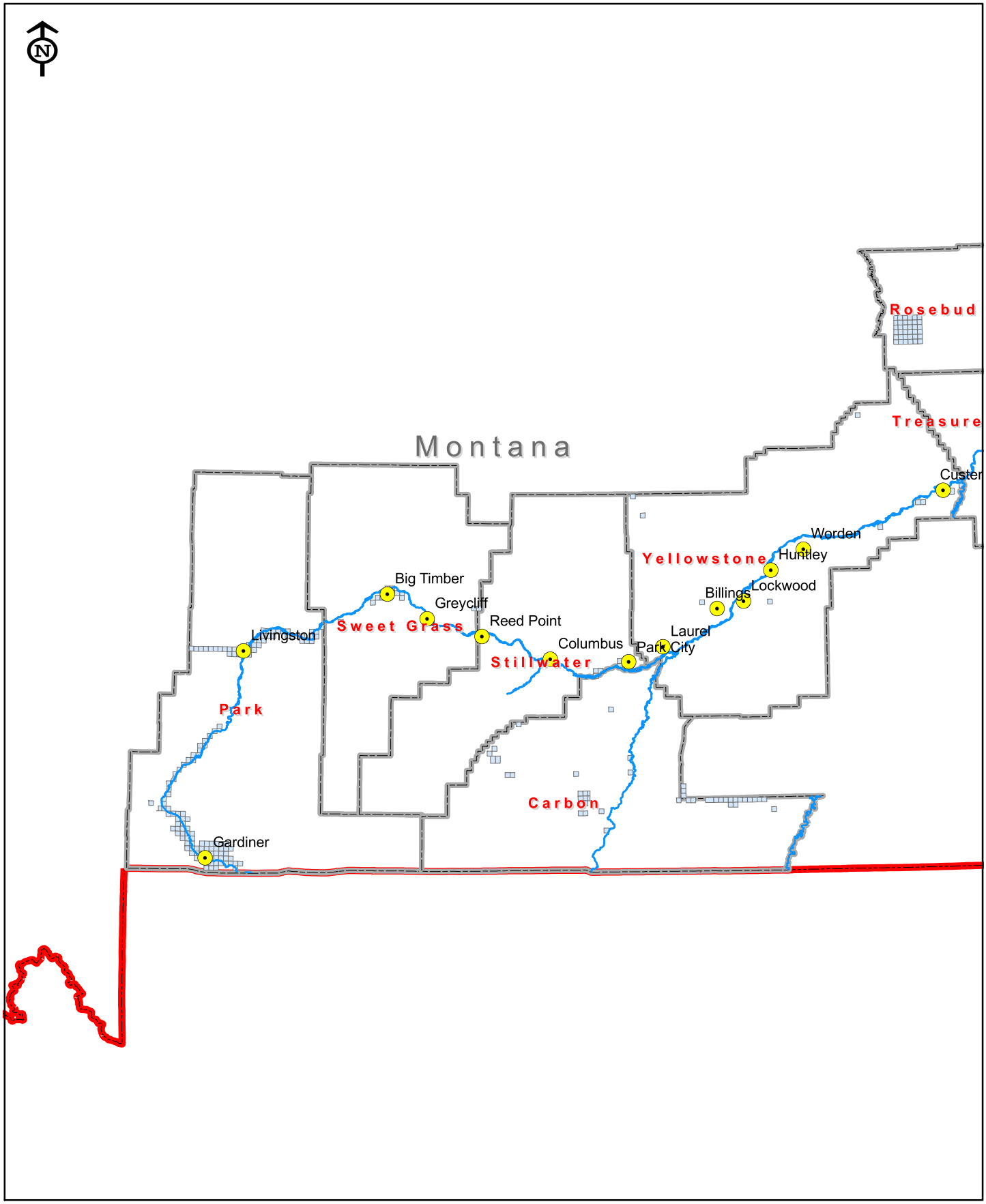
Montana Section Based Noxious Weed Mapping Data Dalmation Toadflax



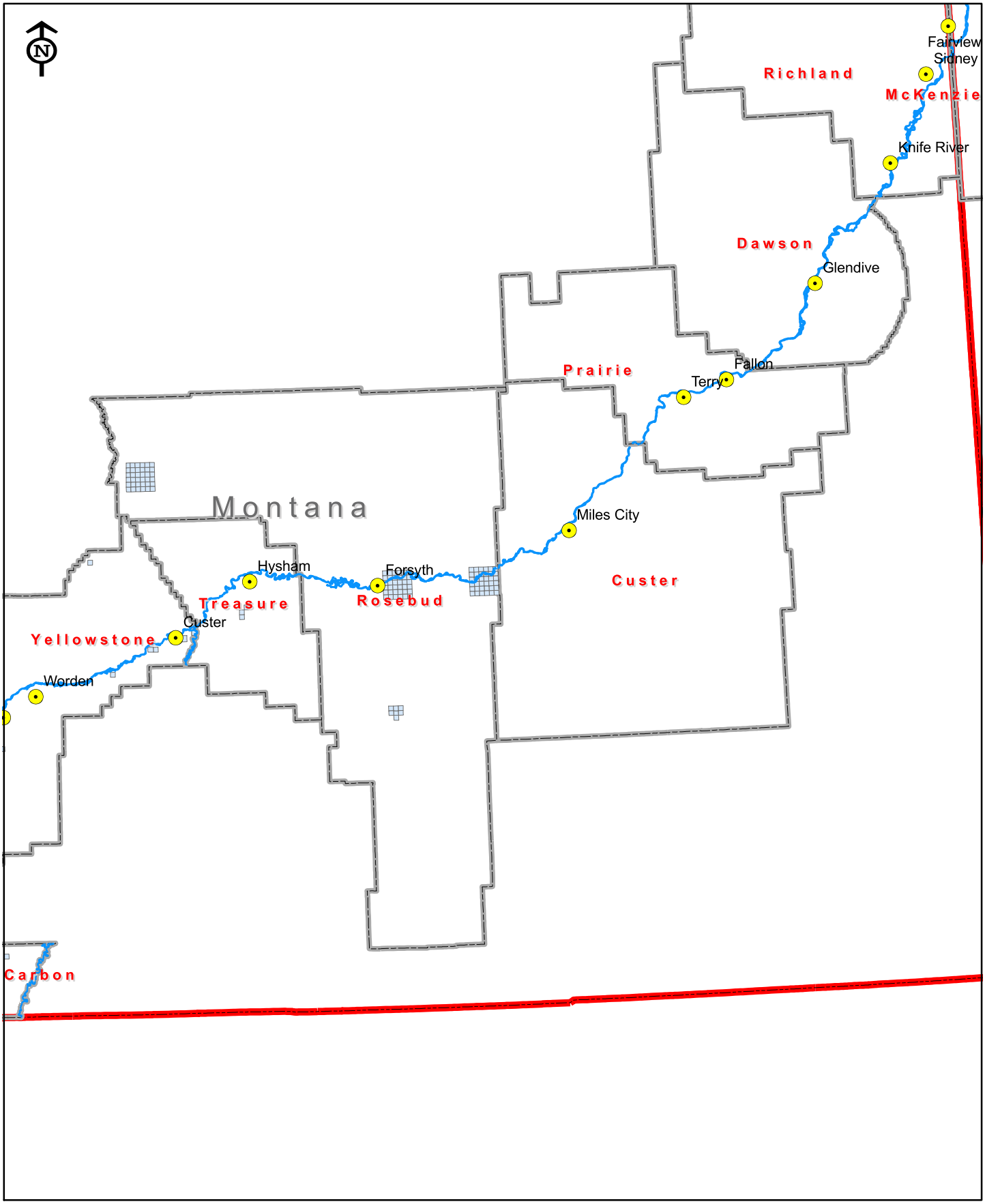
Legend

- Cities And Towns
- Rivers
- County Lines
- State Lines
- Dalmation Toadflax Present
- SectionBased Index

Hysham Enterprises



Montana Section Based
Noxious Weed Mapping Data
Dalmation Toadflax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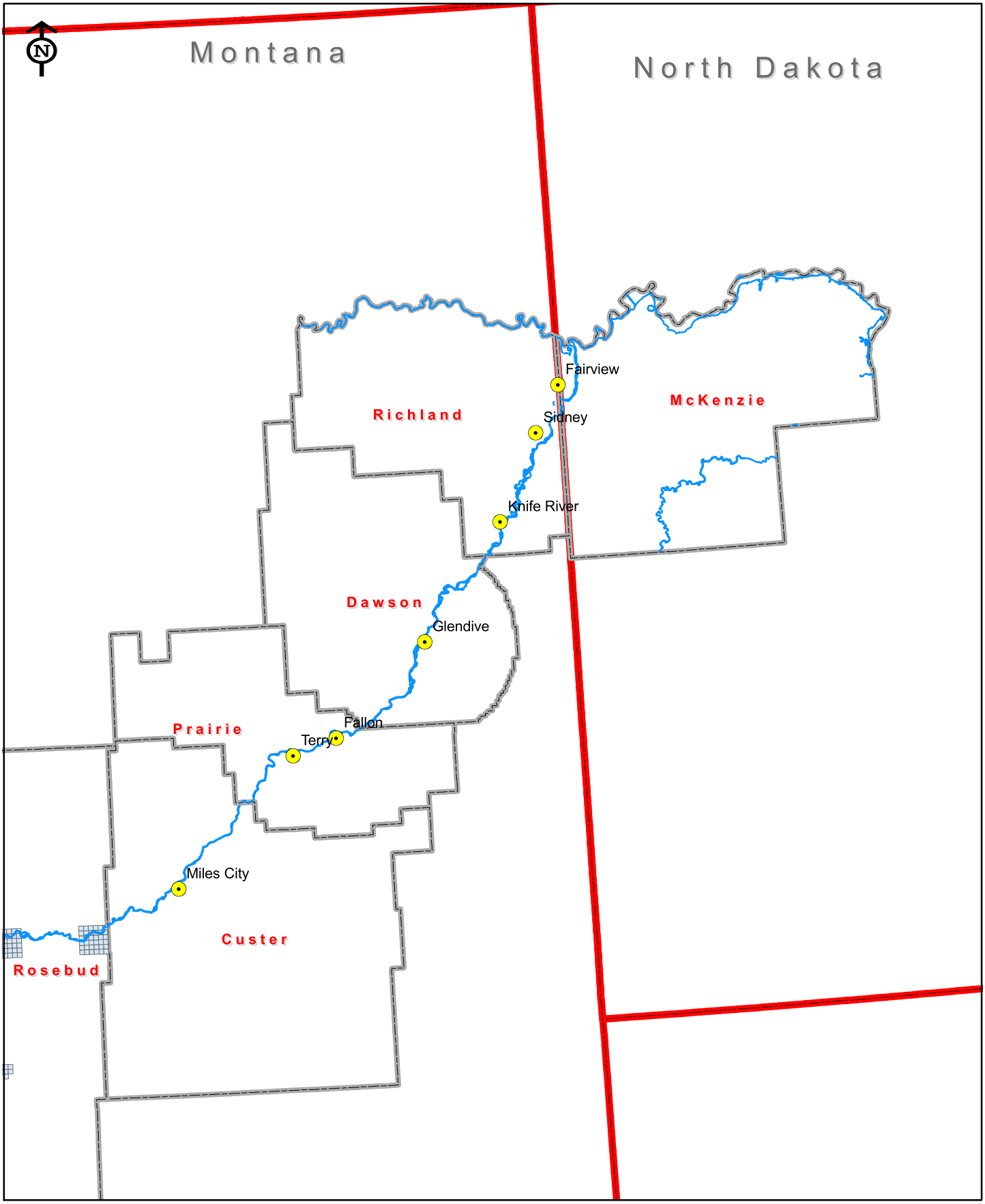
Rosebud
Custer
Yellowstone
Worden
Carbon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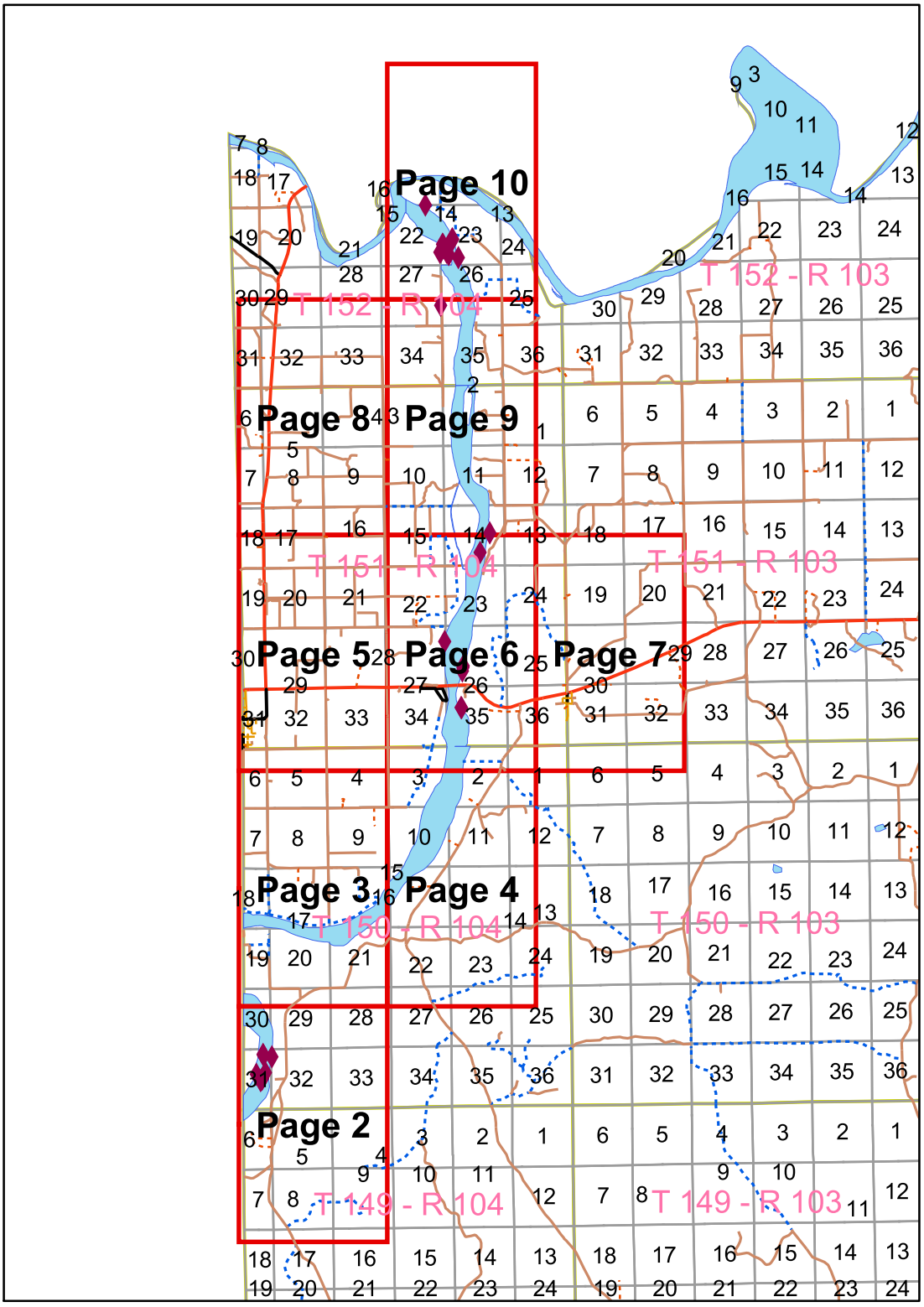
North Dakota
Richland
McKenzie
Fairview
Sidney
Knife River
Dawson
Glendive
Prairie
Fallon
Terry
Miles City
Custer
Rosebud

Appendix D

McKenzie County, North Dakota

Yellowstone River
Salt Cedar
Inventory Project Atlas

McKenzie County, ND
Yellowstone River
Salt Cedar Project



Legend

CommonName

- Saltcedar

Roads

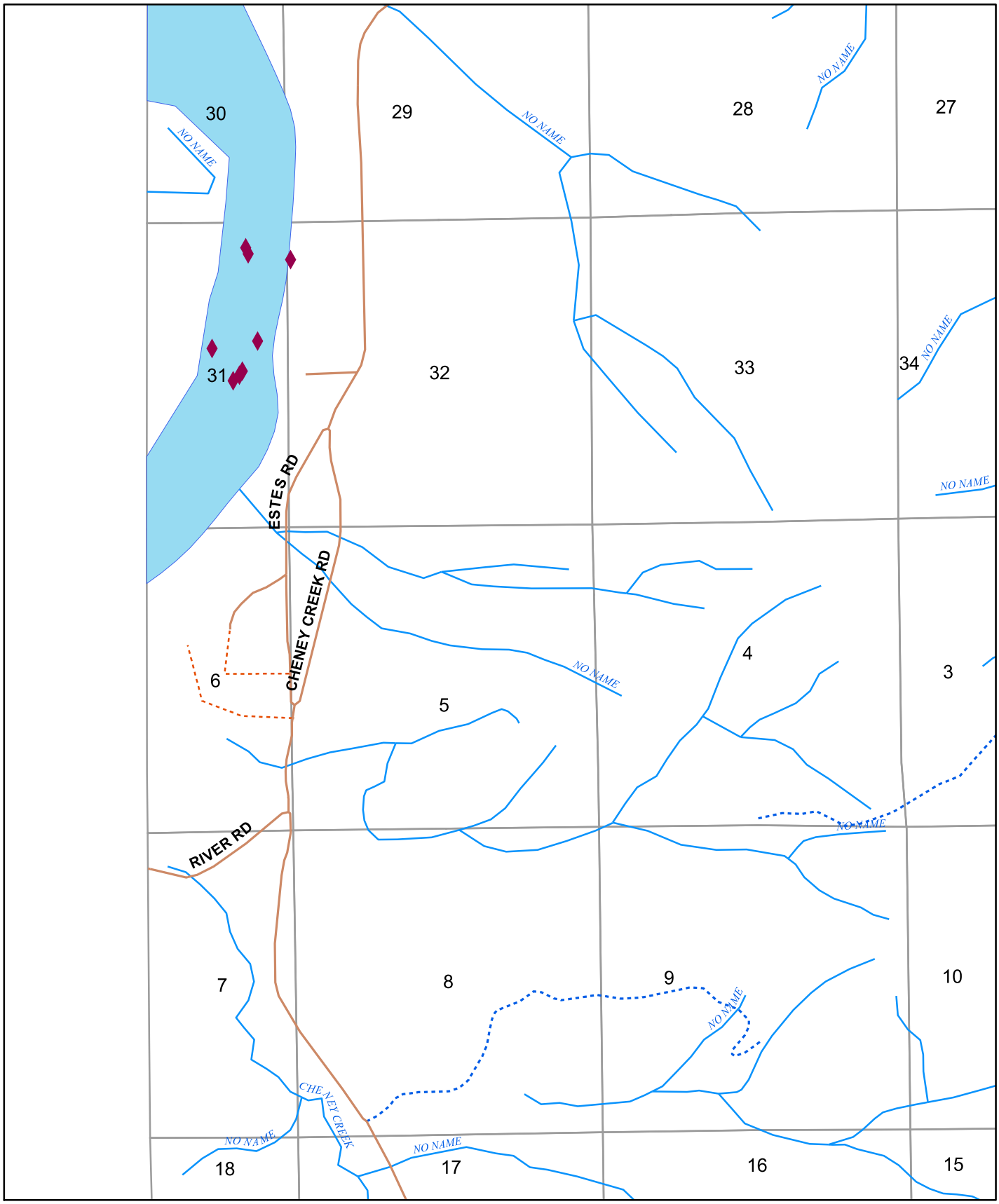
- <all other values>

TYPE

- Highway
- Paved
- Gravel
- Gravel CMC
- Trail
- Municipal
- Private
- Lakes and Rivers
- Sections
- Townships

Hysham Enterprises

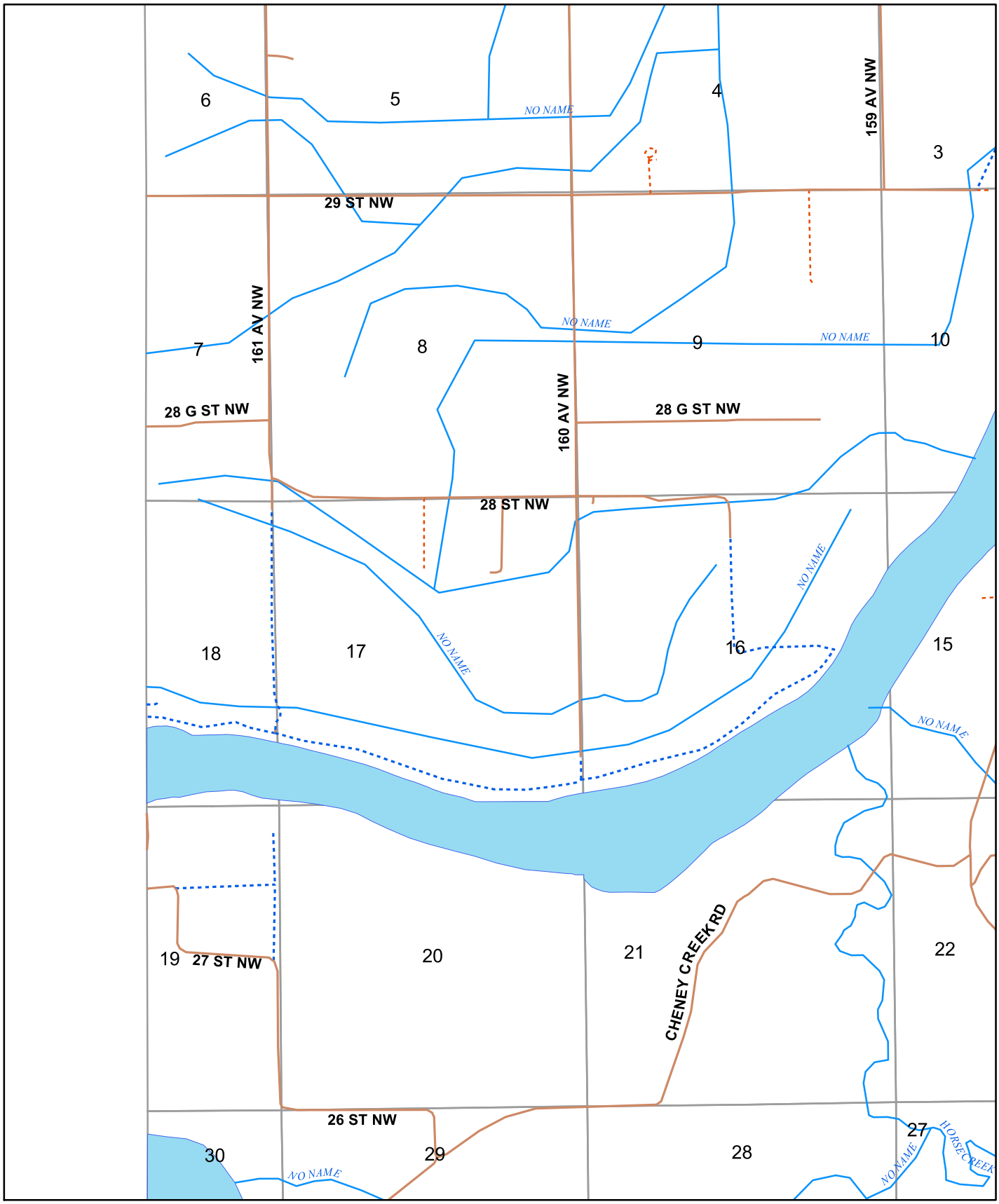
See Page 3



McKenzie County, ND
Yellowstone River
Salt Cedar Project

Hysham Enterprises

See Page 5



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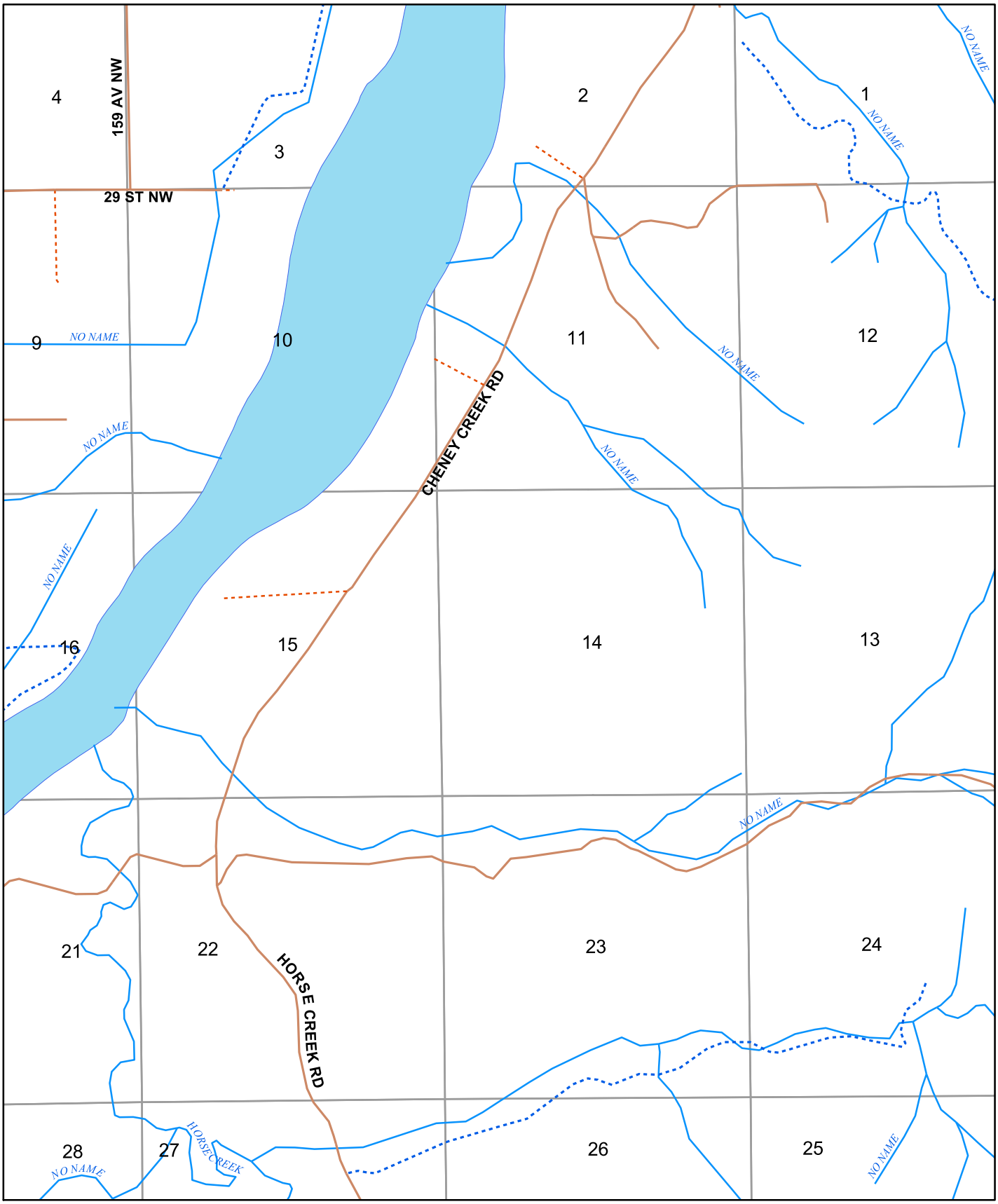
McKenzie County, ND
Yellowstone River
Salt Cedar Project

Hysham Enterprises

See Page 6



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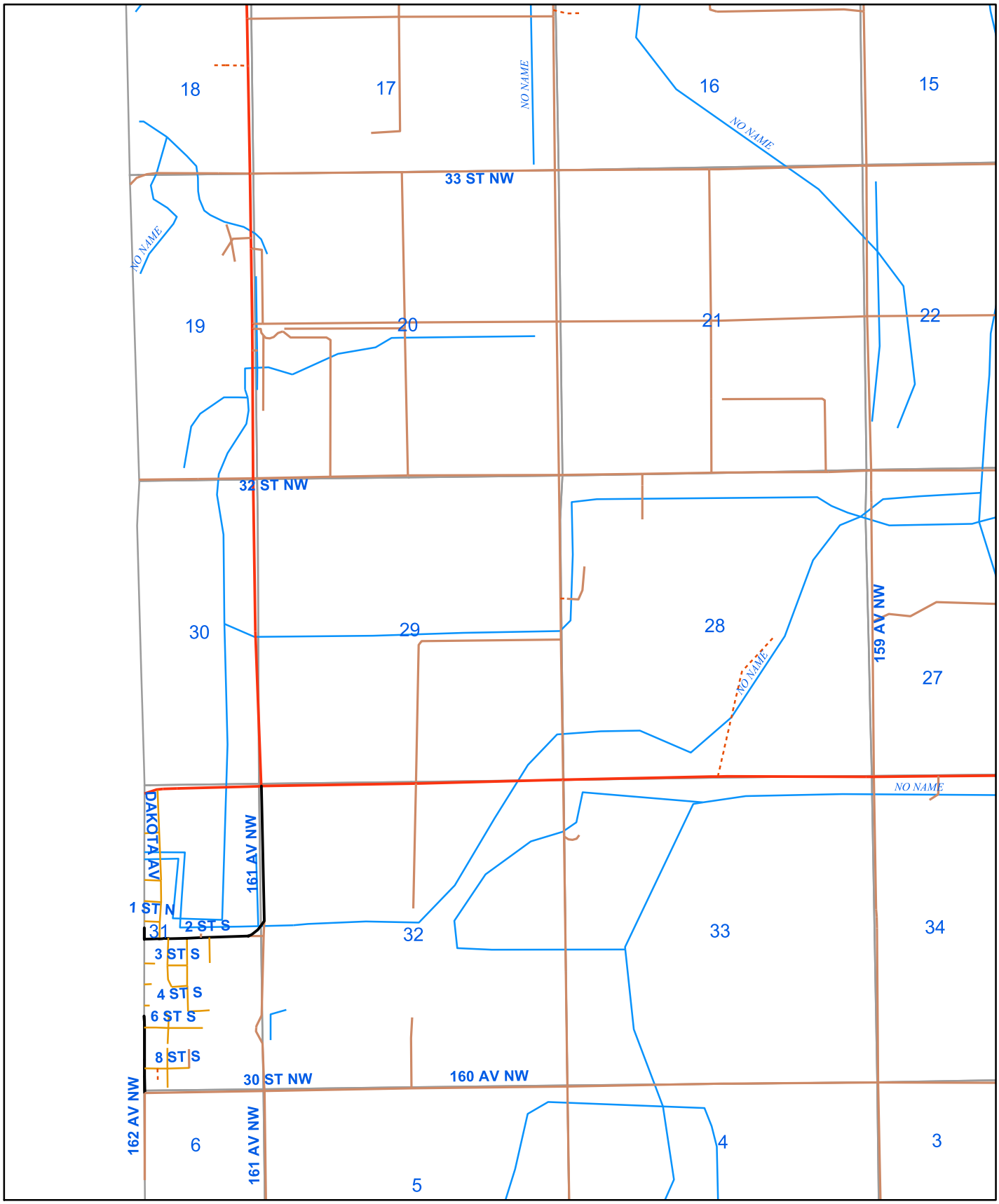
McKenzie County, ND
Yellowstone River
Salt Cedar Project

Hysham Enterprises

See Page 8



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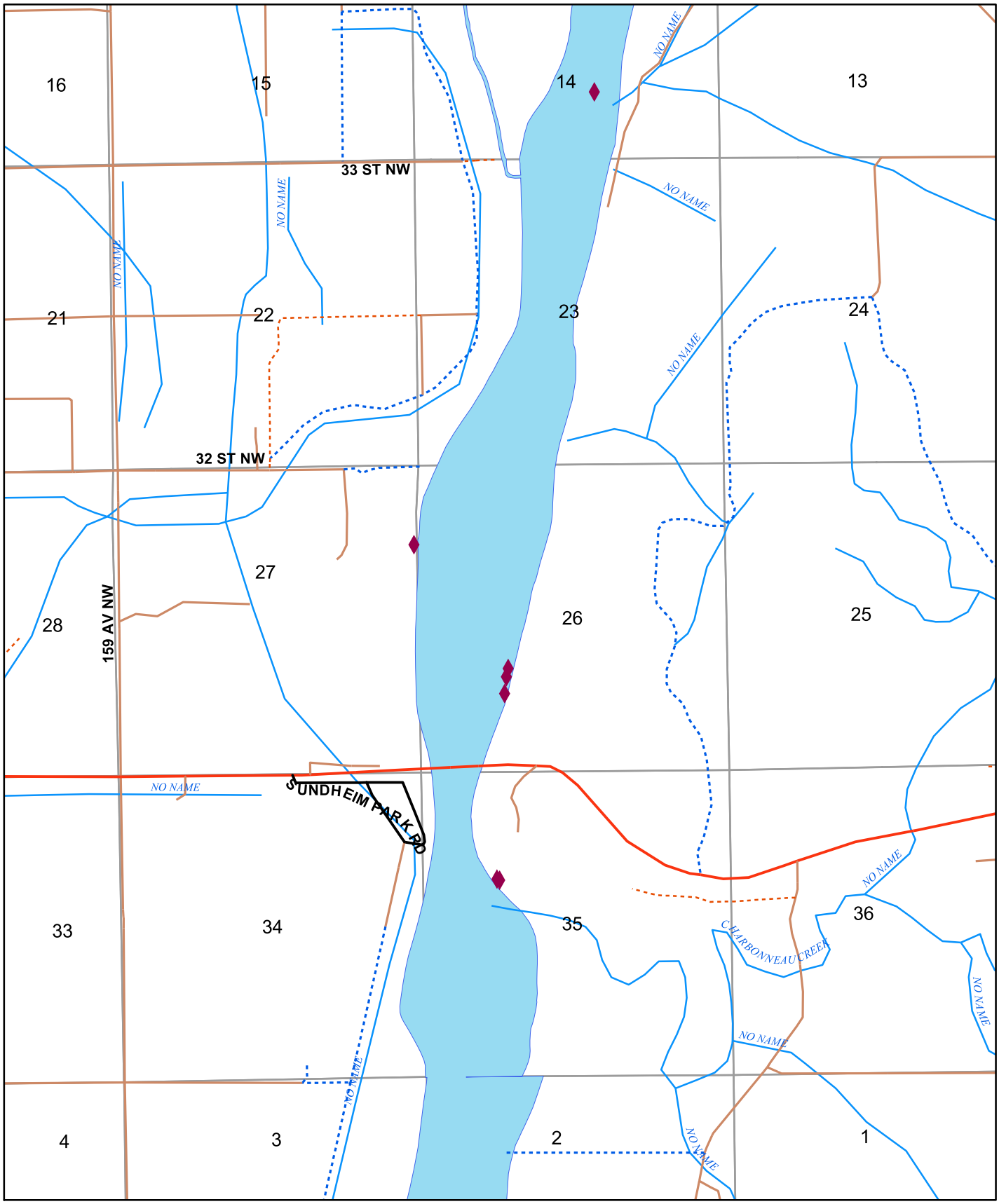
McKenzie County, ND
Yellowstone River
Salt Cedar Project

Hysham Enterprises

See Page 9



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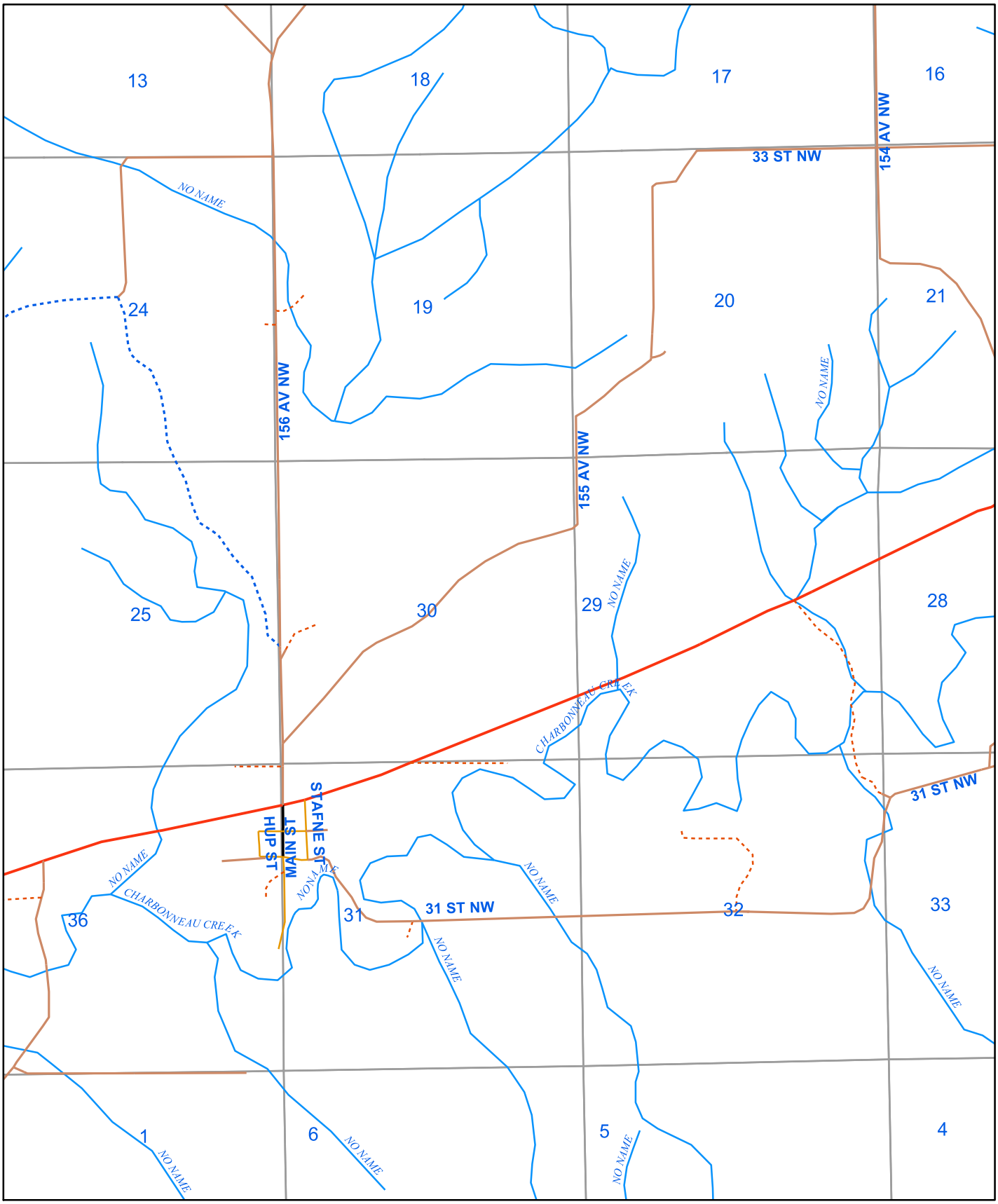
See Page 4

McKenzie County, ND
Yellowstone River
Salt Cedar Project

Hysham Enterprises

See Page 9



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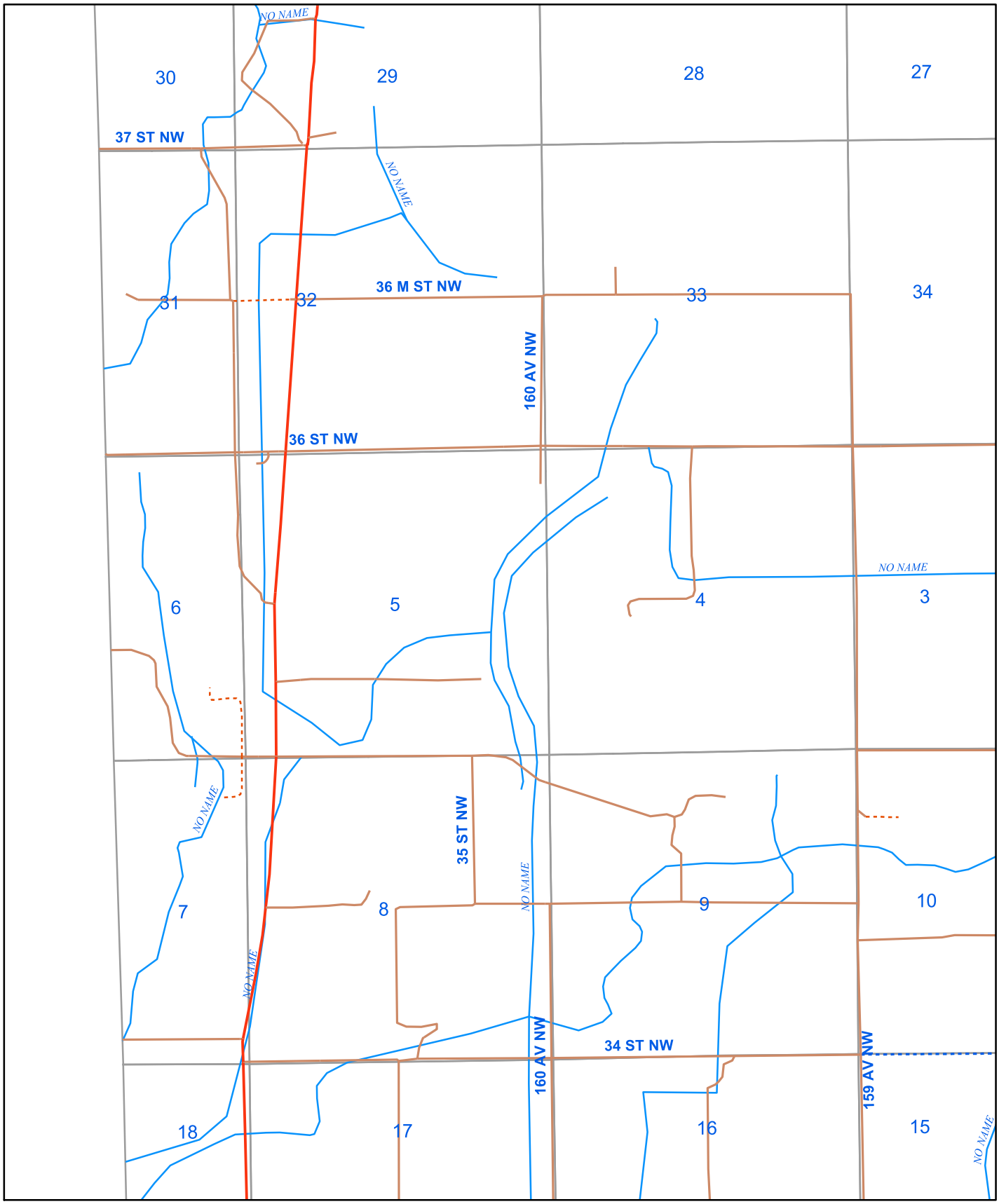
See Page 4

McKenzie County, ND
Yellowstone River
Salt Cedar Project

Hysham Enterprises

See Page 10



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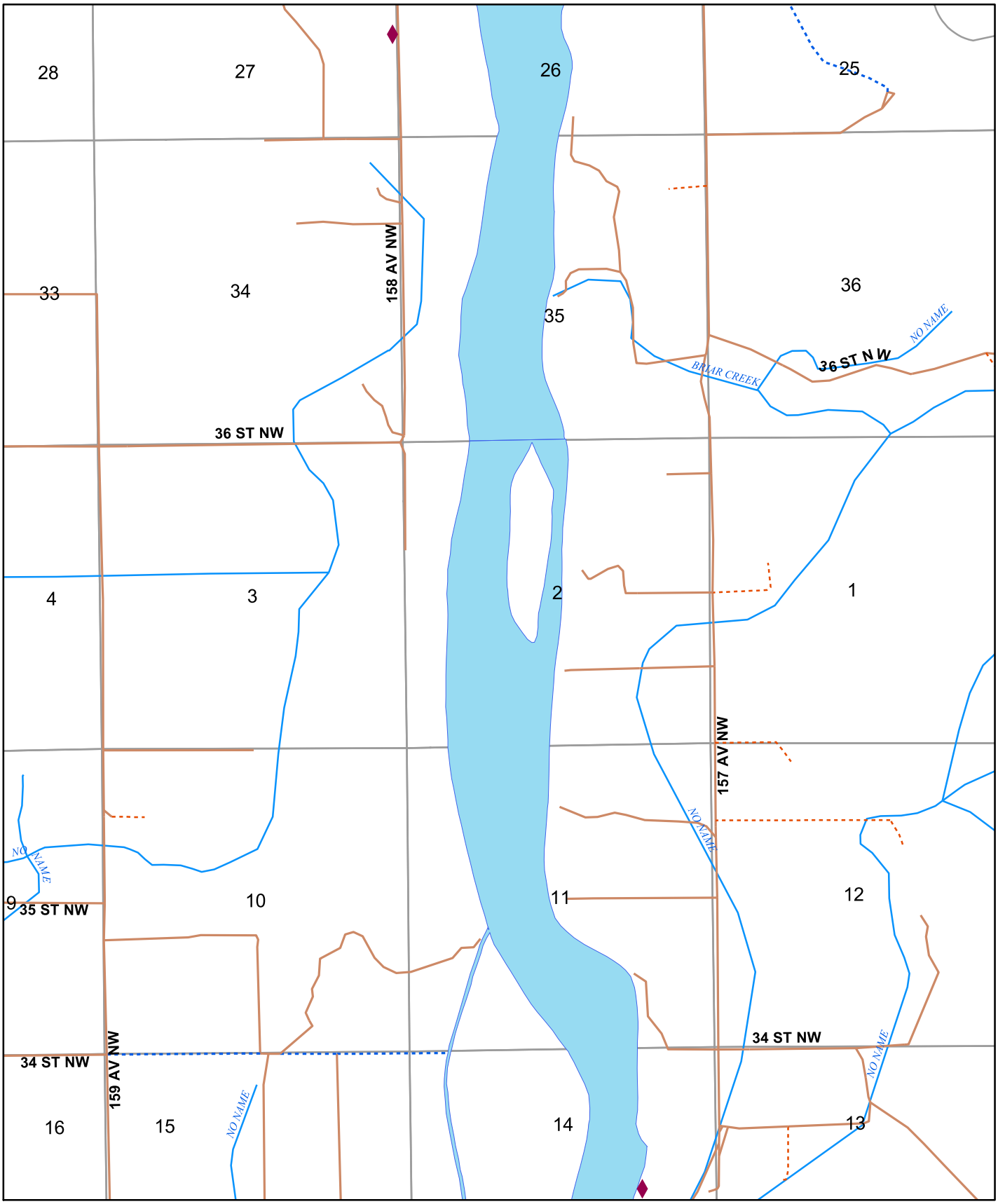
See Page 5

McKenzie County, ND
Yellowstone River
Salt Cedar Project

Hysham Enterprises

See Page 10



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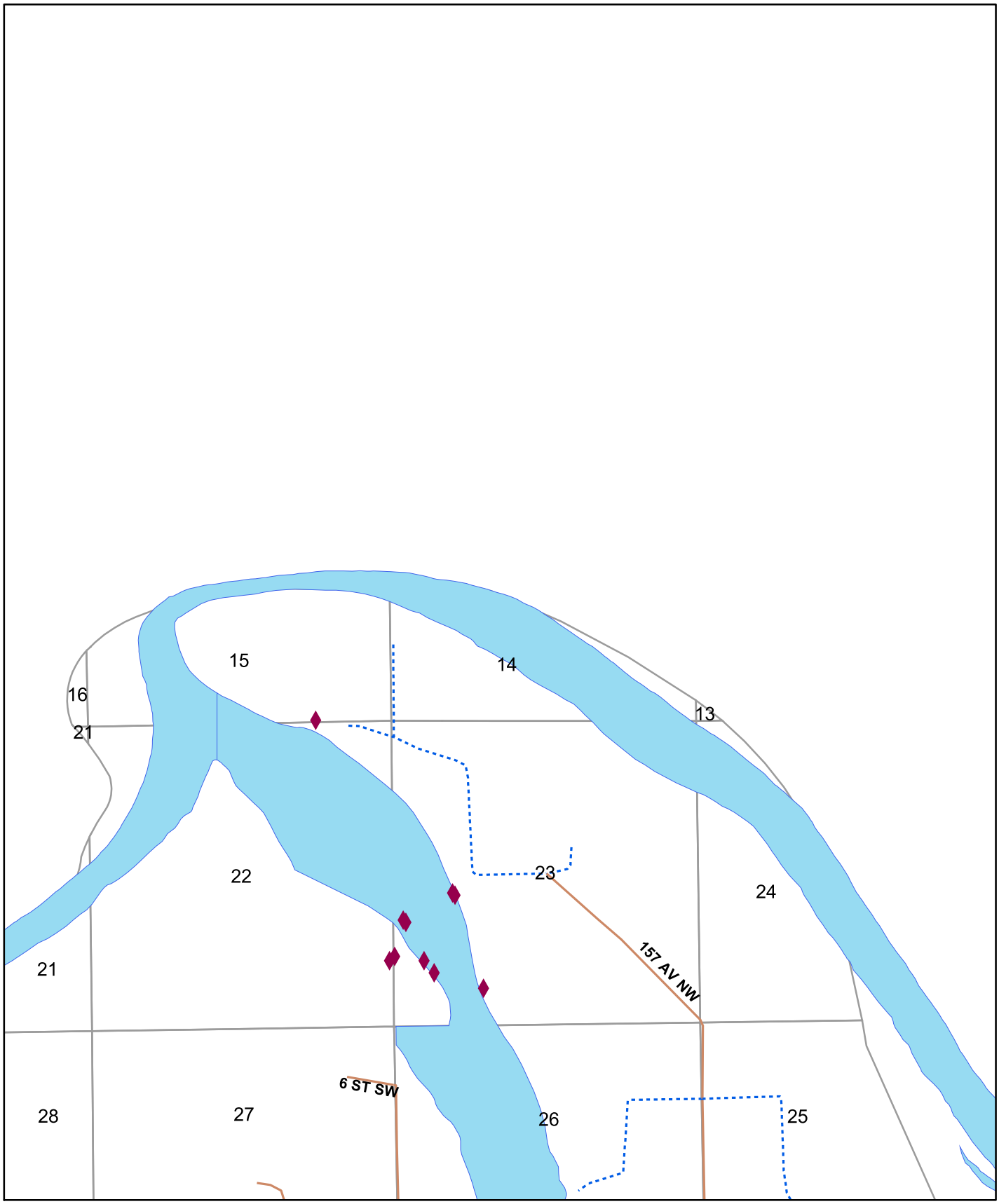
See Page 6

McKenzie County, ND
Yellowstone River
Salt Cedar Project

Hysham Enterprises



See Page 9

McKenzie County, ND
Yellowstone River
Salt Cedar Project

Hysham Enterprises

Appendix E

Cooperative Helicopter

Noxious Weed Inventory

Atlas Insert

Project Years 2000-2001

2001 Helicopter Cooperative Noxious Weed Aerial Inventory Project

Legend

- helicopter index 5
- Section Lines
- 2000 Salt Cedar Point
- 2000 Salt Cedar Line
- 2000 Salt Cedar Area

2001 Weed Points

SPECIES

- Leafy spurge
- Salt cedar

SPECIES

- Leafy spurge

2001 Weed Area

SPECIES

- Leafy spurge
- Salt cedar
- Cities & Towns
- Landmark_Points
- Highways

Roads

Classification

- Primary Road
- Secondary Road
- Connecting Road
- Neighborhood Roads
- Jeep Trail
- Special Road Feature
- Other Thoroughfare

Railroad

NET

- Active Route
- Abandoned Route
- Other Active Or Abandoned Track
- Sidings
- Rivers & Streams

Rivers & Streams

Classification

- Stream
- Canal, Ditch or Aqueduct

Landmark_Poly

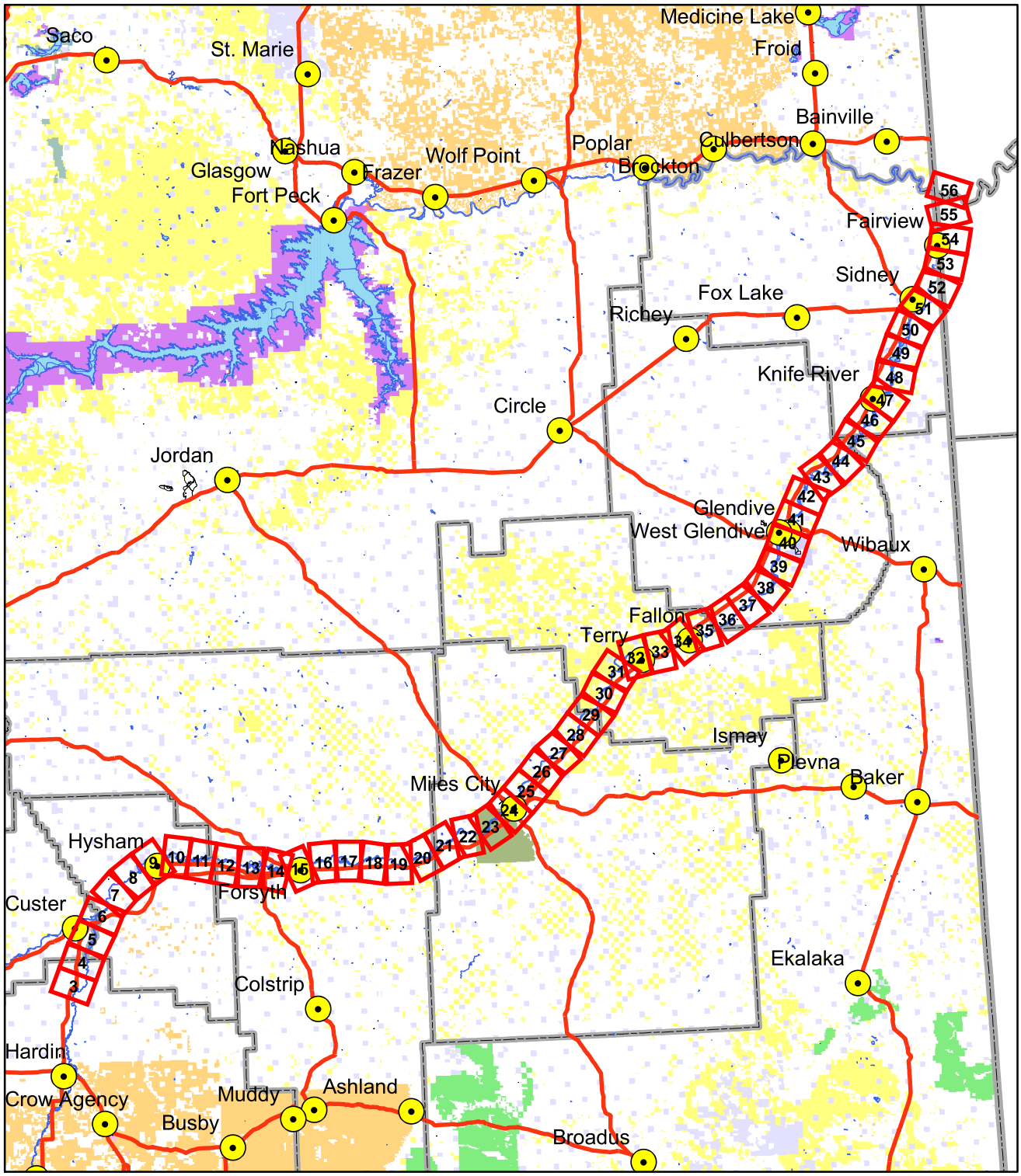
Classification

- Airport, Military, College, Etc.
- Names Islands
- Lakes, Reserviors, Etc.
- Ponds & Lakes
- Montana
- CES Project County Lines

- US Bureau of Land Management
- US Bureau of Reclamation
- US Fish and Wildlife Service
- National Park Service
- US Forest Service
- US Dept of Agriculture
- US Army Corps of Engineers
- US Dept of Defense
- Montana State Government
- Montana School Trust Lands
- Montana Fish, Wildlife, and Parks
- Montana University System
- Montana Institutions
- Montana Dept of Transportation
- Montana DNRC Water Projects
- Local Government
- County property
- City property
- Bureau of Indian Affairs Trust
- Blackfeet Tribal Lands
- Crow Tribal Lands
- Salish and Kutenai Tribal Lands
- Fort Belknap Tribal Lands
- Fort Peck Tribal Lands
- Northern Cheyenne Tribal Lands
- Chippewa-Cree Tribal Lands
- Turtle Mountain Tribal Lands
- Private Land
- Plum Creek Timber lands
- Private Conservation lands
- The Nature Conservancy
- Montana Land Reliance
- Rocky Mountain Elk Foundation
- Ducks Unlimited

- Boone and Crockett Club
- Five Valleys Land Trust
- Flathead Land Trust
- Gallatin Valley Land Trust
- Prickly Pear Land Trust
- Bitter Root Land Trust
- Water
- Water - federal
- Water - state
- Water - tribal
- Water - private
- Water - navigable
- Water - state/federal
- Yellowstone_River

2000 & 2001 Helicopter Cooperative Noxious Weed Aerial Inventory Project



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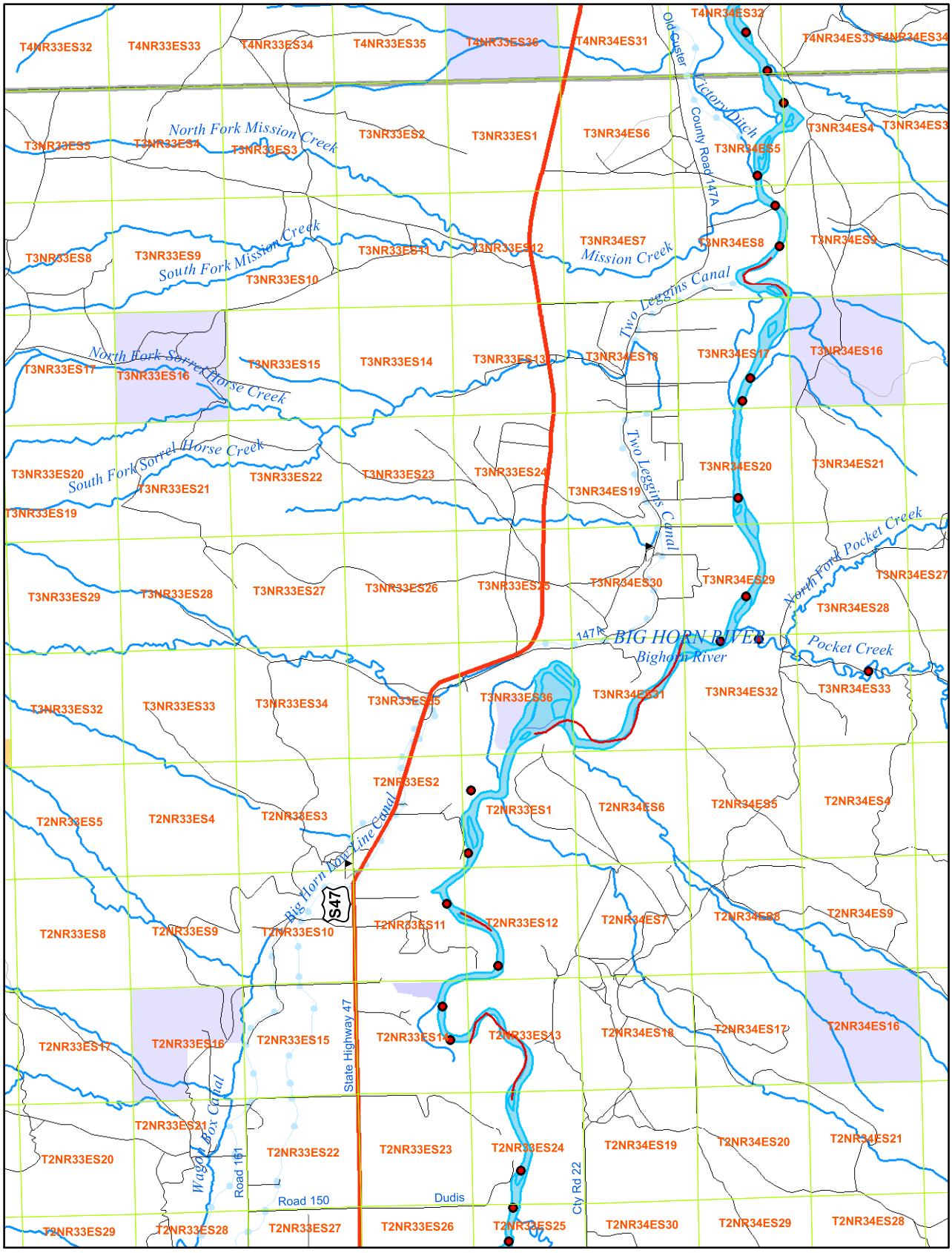
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T4NR33ES33
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T4NR34ES32
T4NR34ES33
T4NR34ES34
Old Custer
Tiffany Ditch
County Road 147A
North Fork Mission Creek
T3NR33ES1
T3NR33ES2
T3NR33ES3
T3NR33ES4
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Bighorn River
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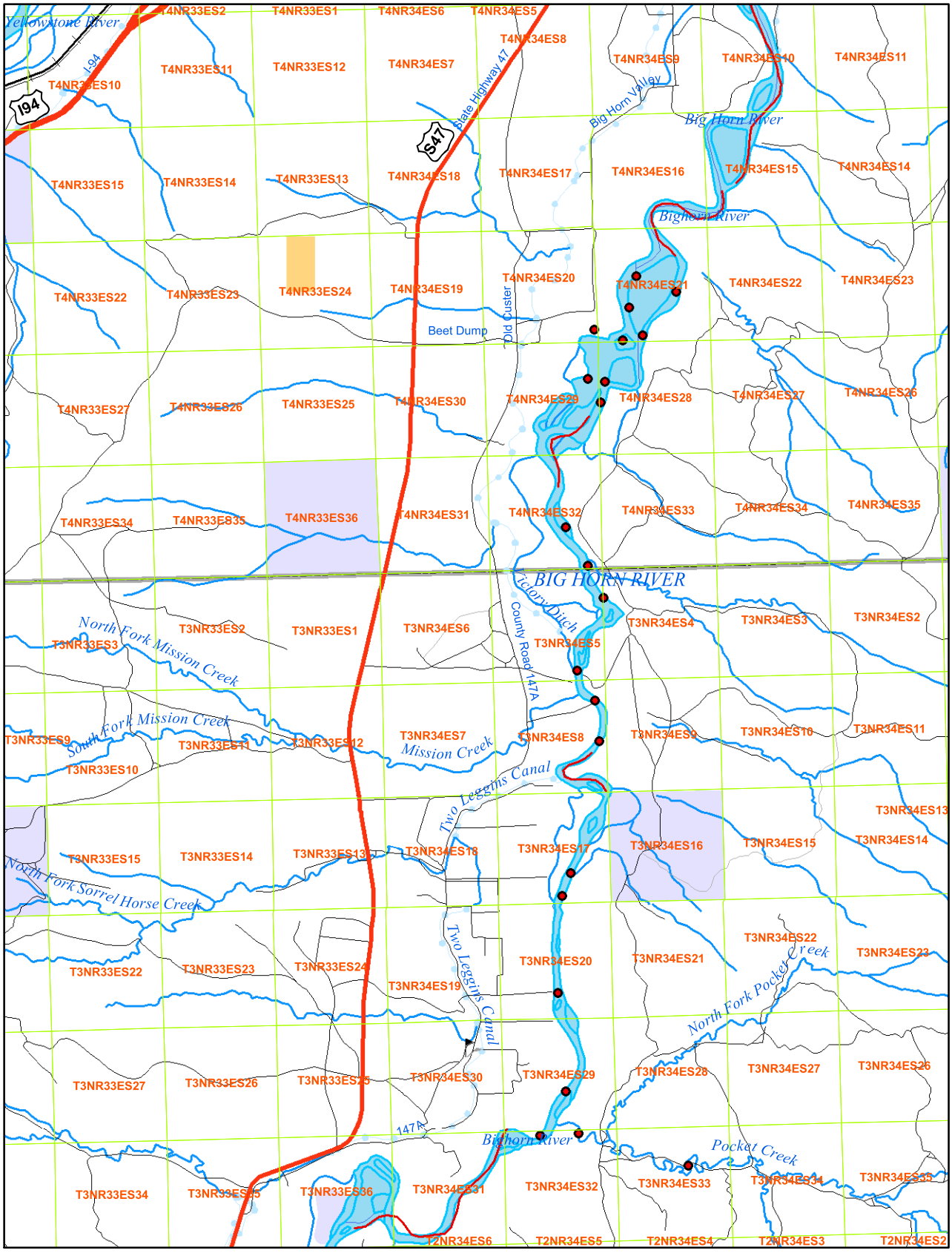
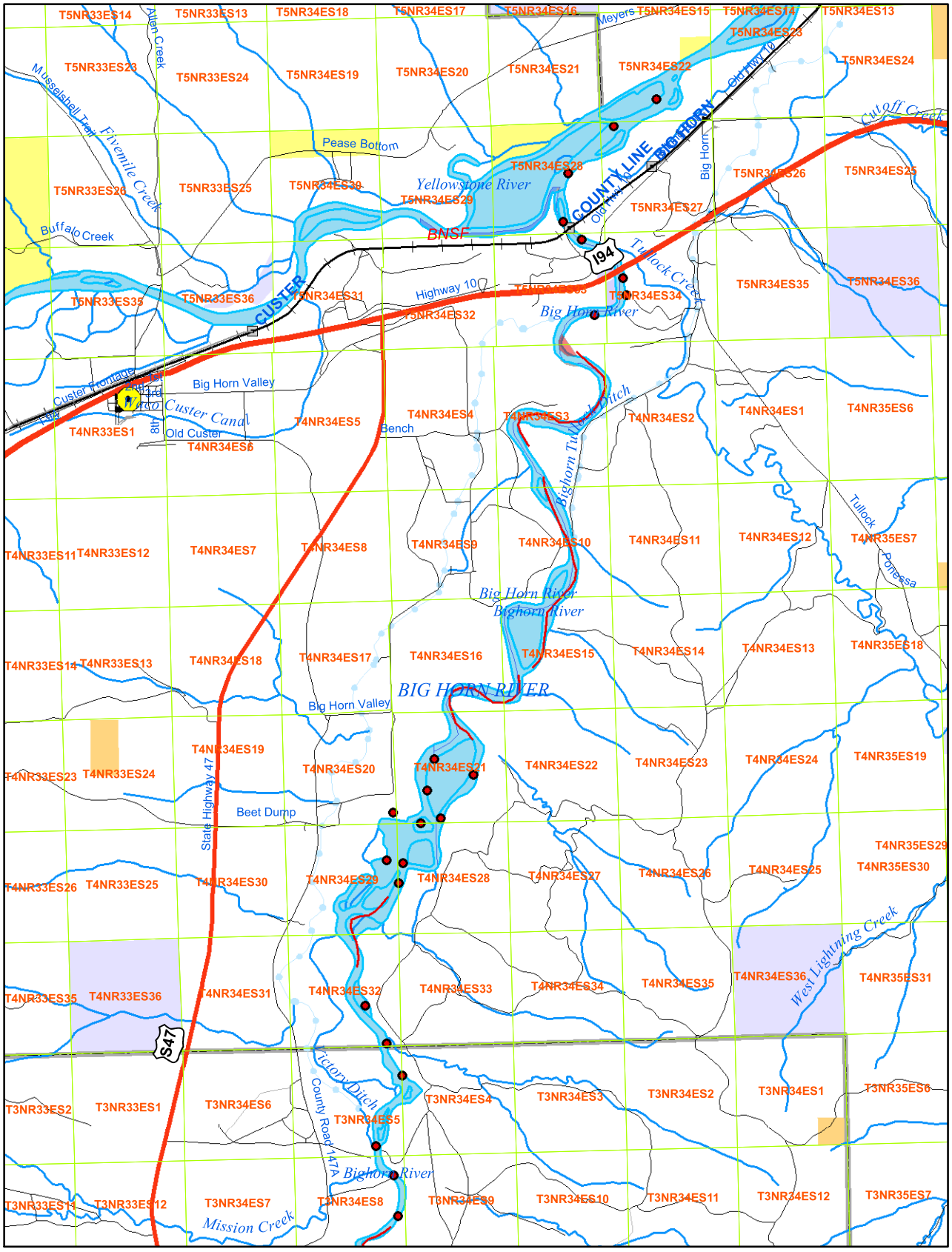


See Page 3

Hysham Enterprises

2000 & 2001 Helicopter
Noxious Weed
Inventory Projects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Fivemile Creek
Buffalo Creek
Pease Bottom
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Big Horn
Cutoff Creek
BNSF
I94
Tullock Creek
CUSTER
Highway 10
Big Horn River
Custer Frontage Rd
Big Horn Valley
Custer Canal
Old Custer
Bench
Bighorn Tullock Ditch
Tullock
Ponteesa
Big Horn River
Bighorn River
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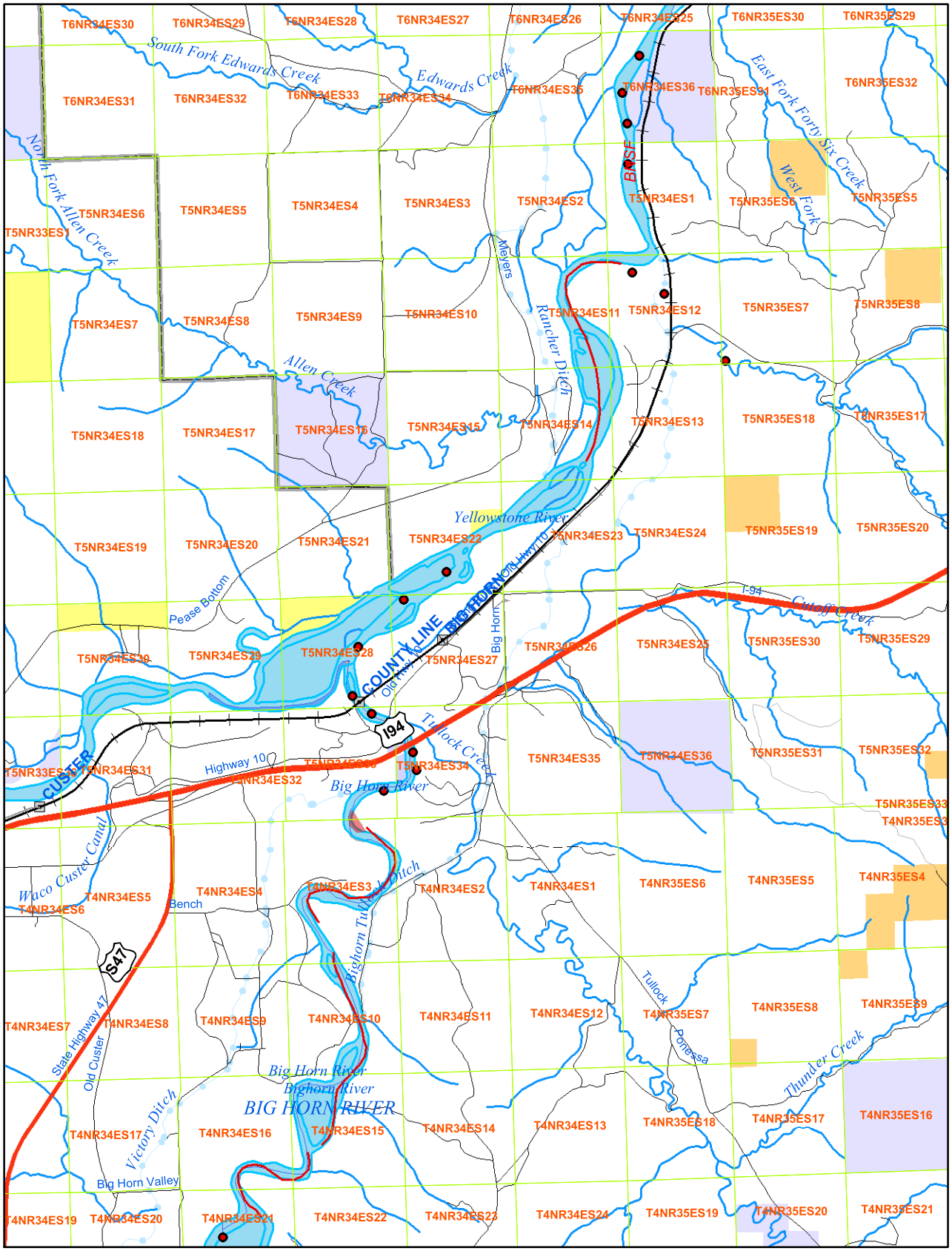
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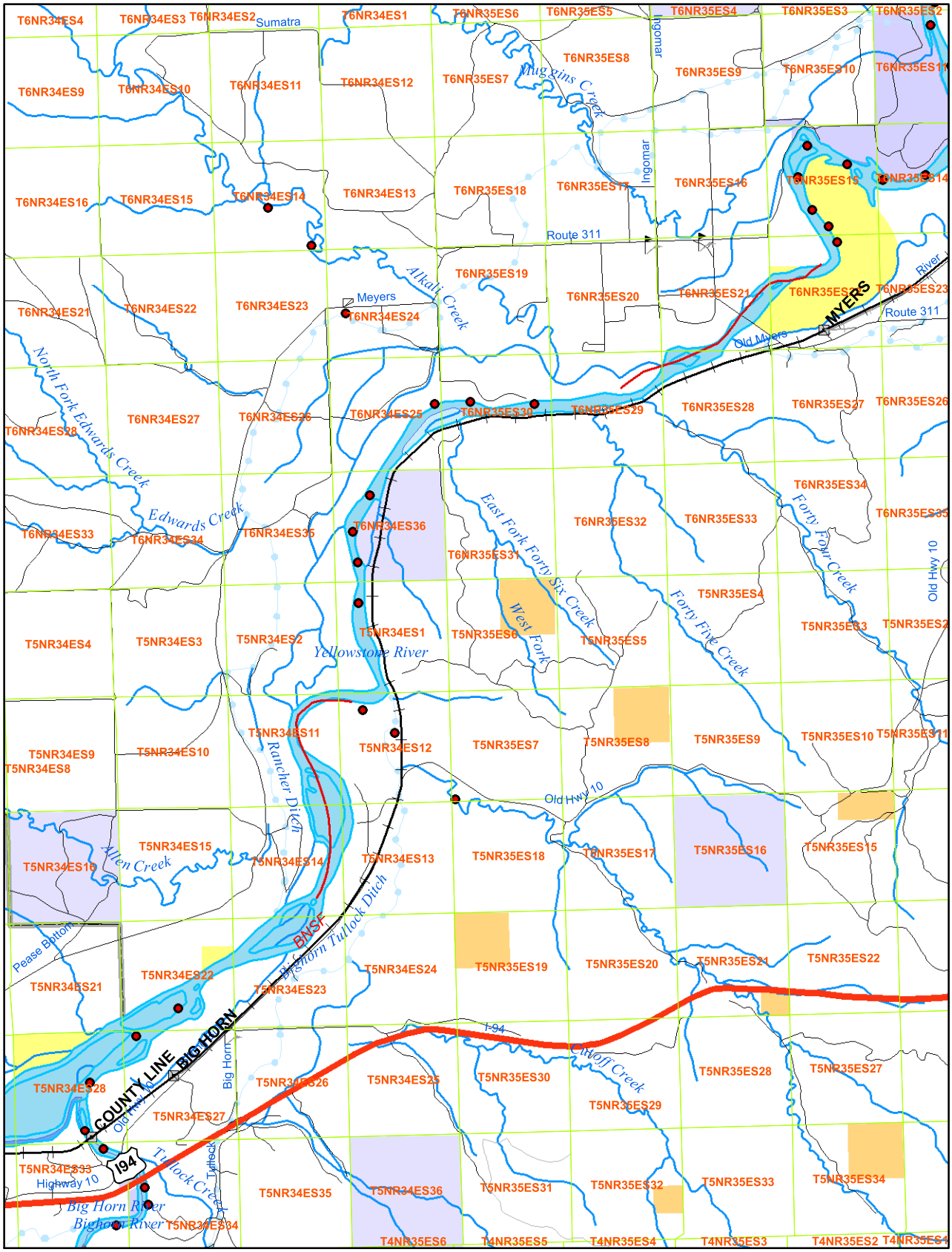
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Forty Four Creek
Forty Five Creek
Old Hwy 10
Yellowstone River
Rancher Ditch
Allen Creek
Pease Bottom
BNSF
Bighorn Tullock Ditch
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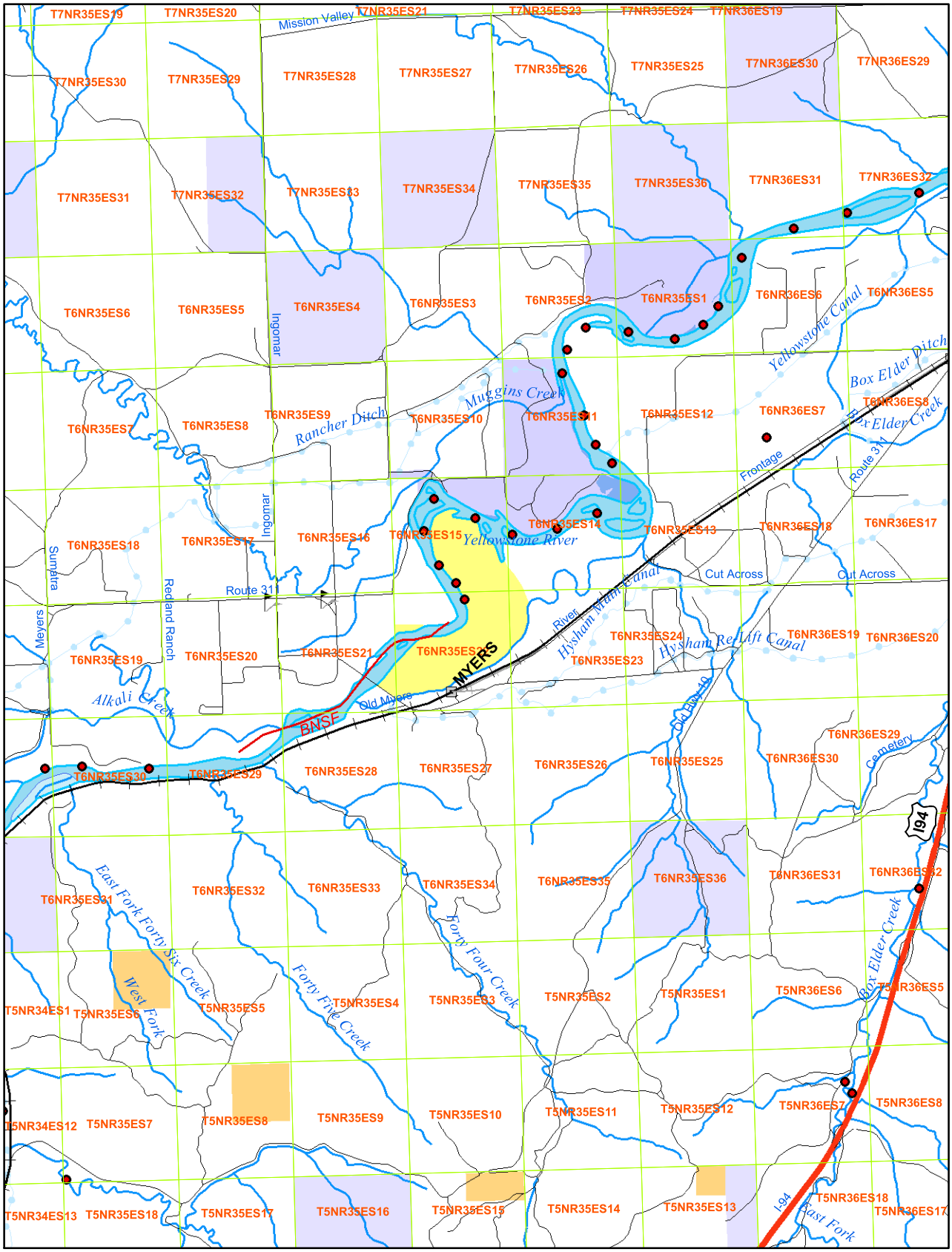
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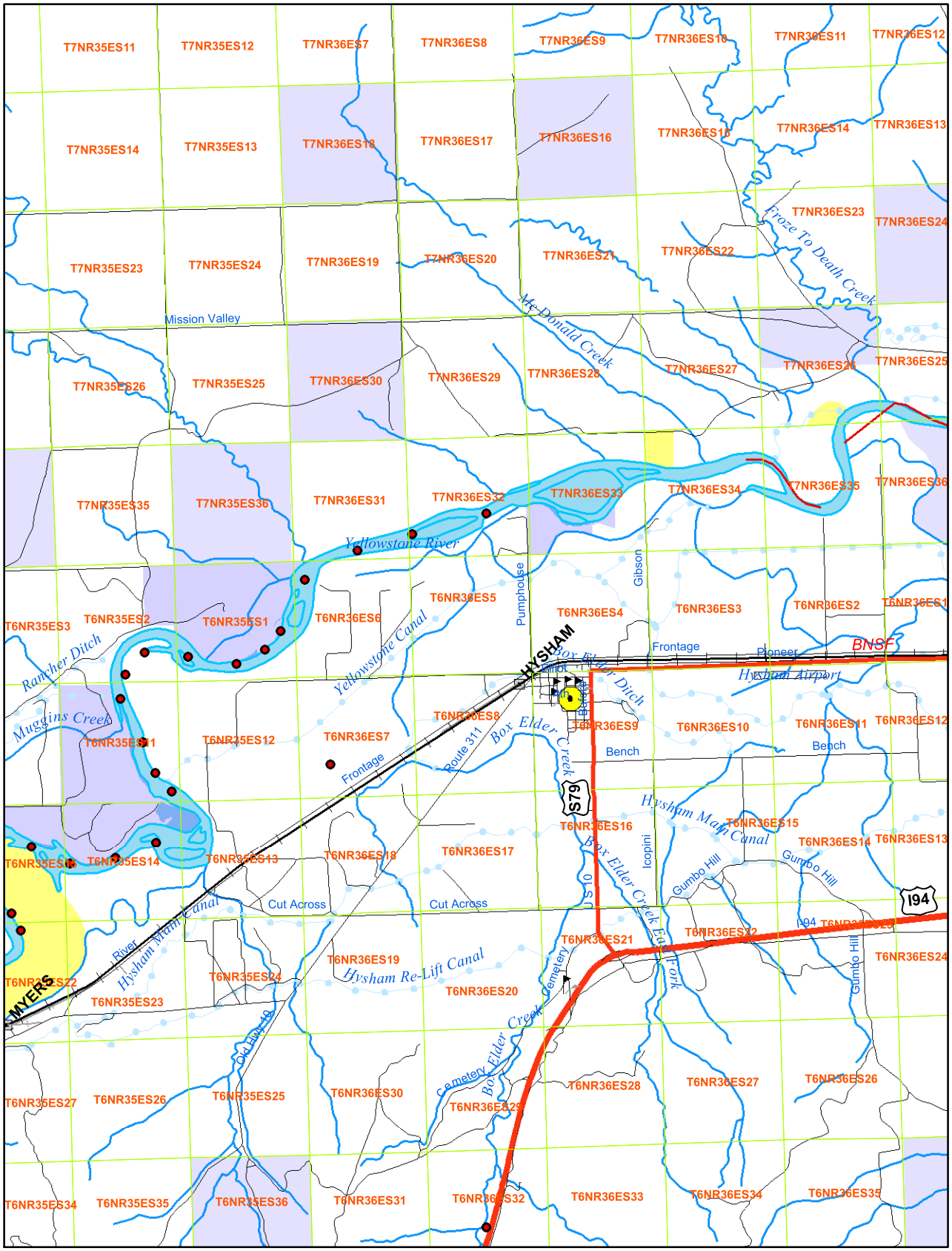
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Cut Across
S10
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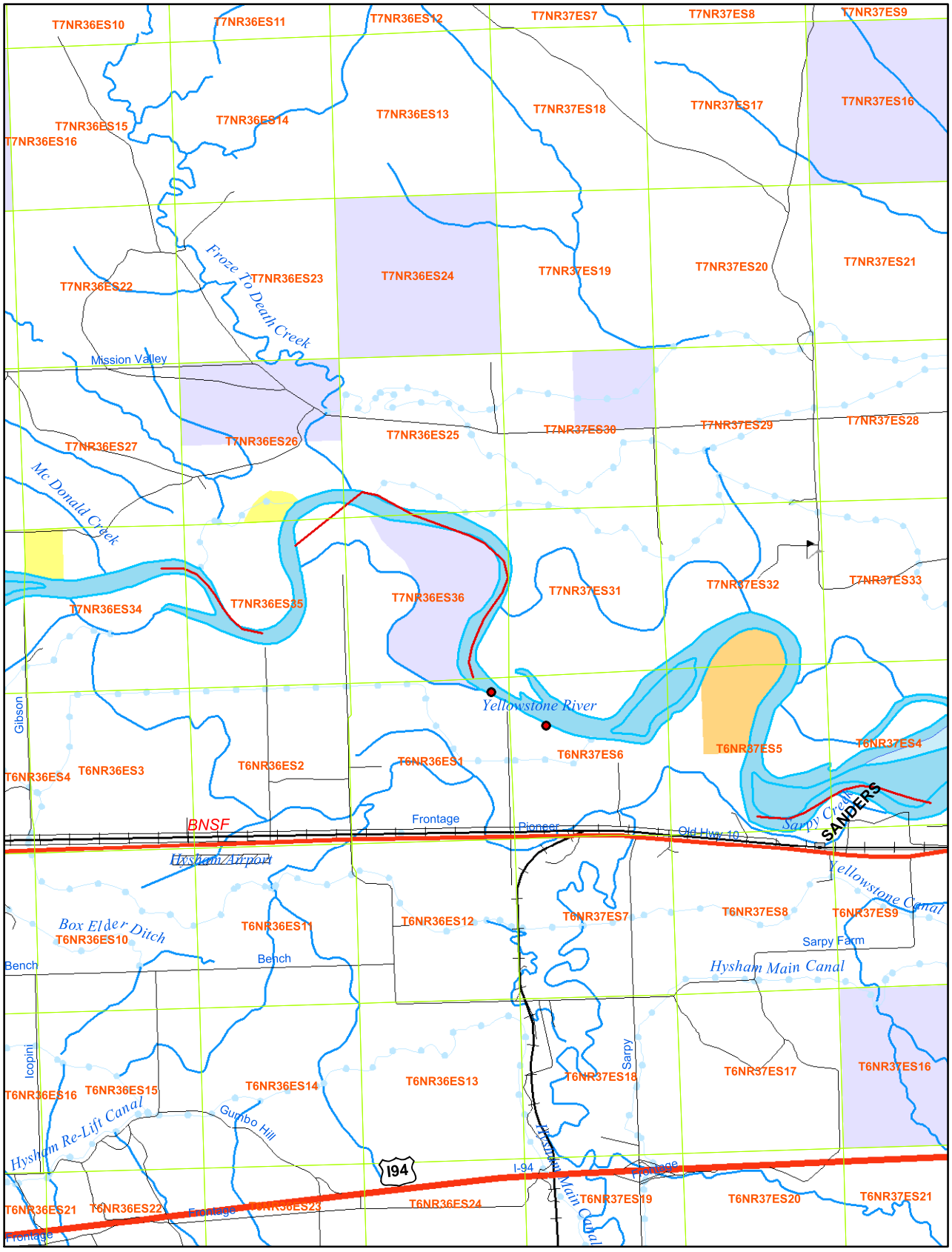
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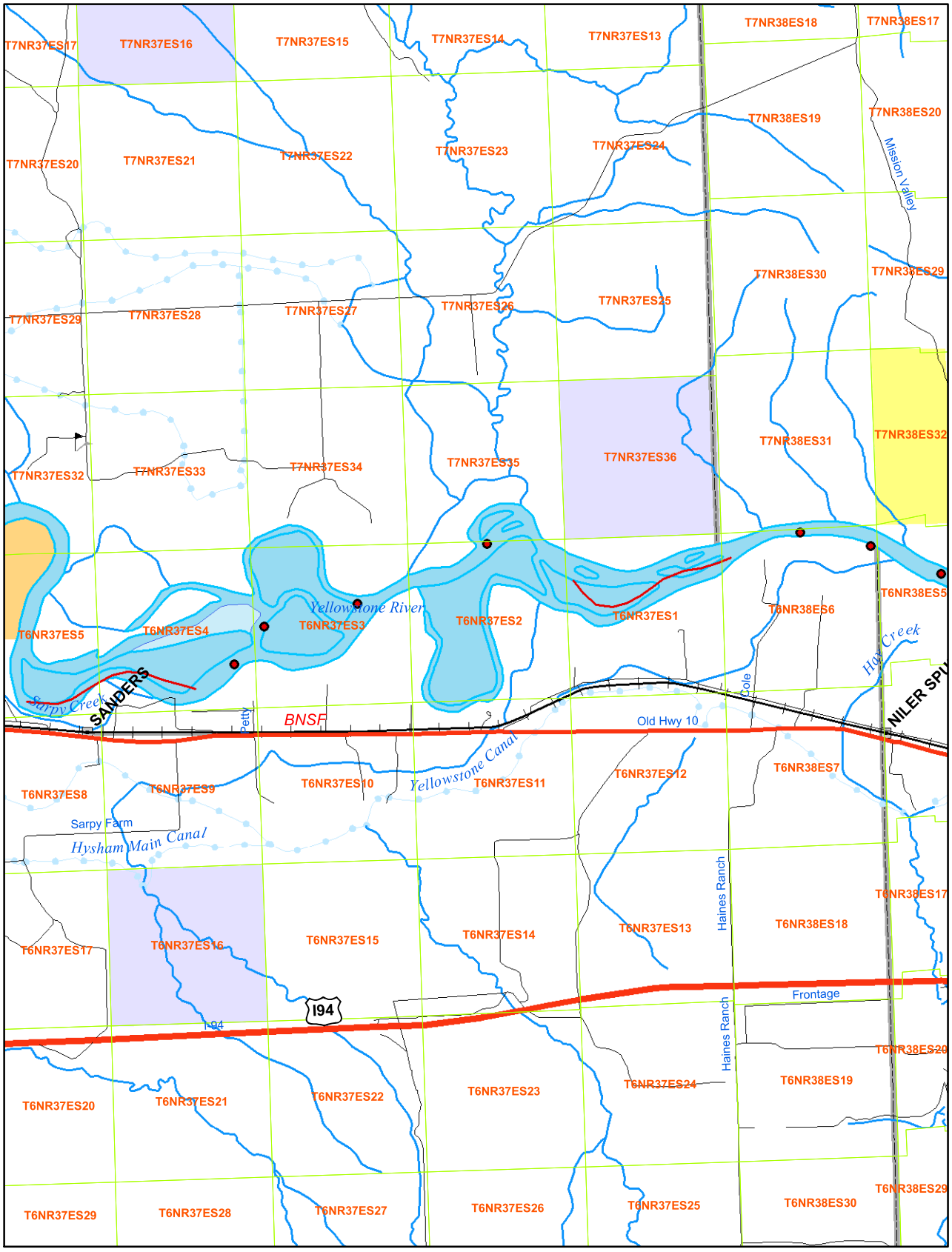
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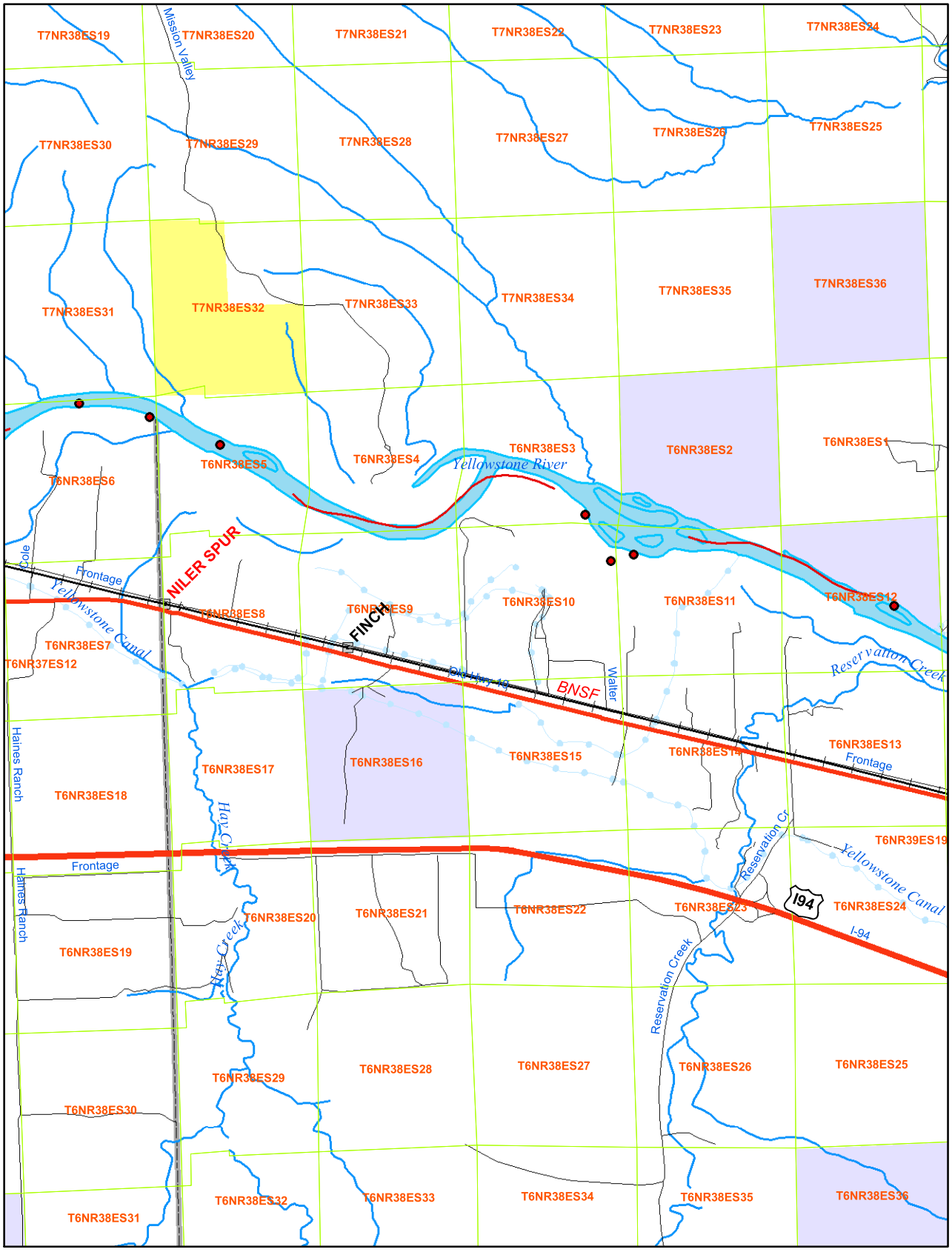
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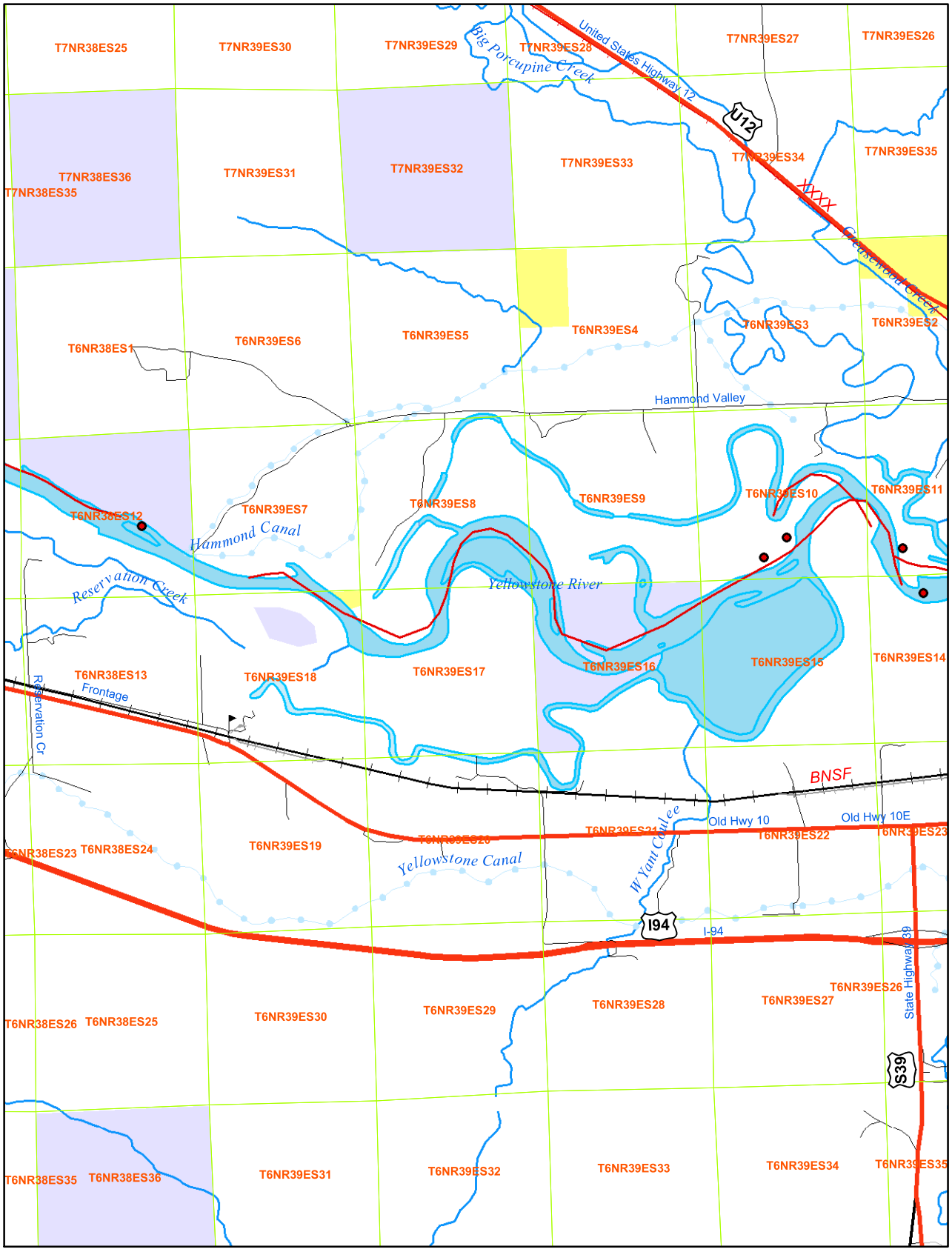
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Frontage
BNSF
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Old Hwy 10E
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State Highway 39
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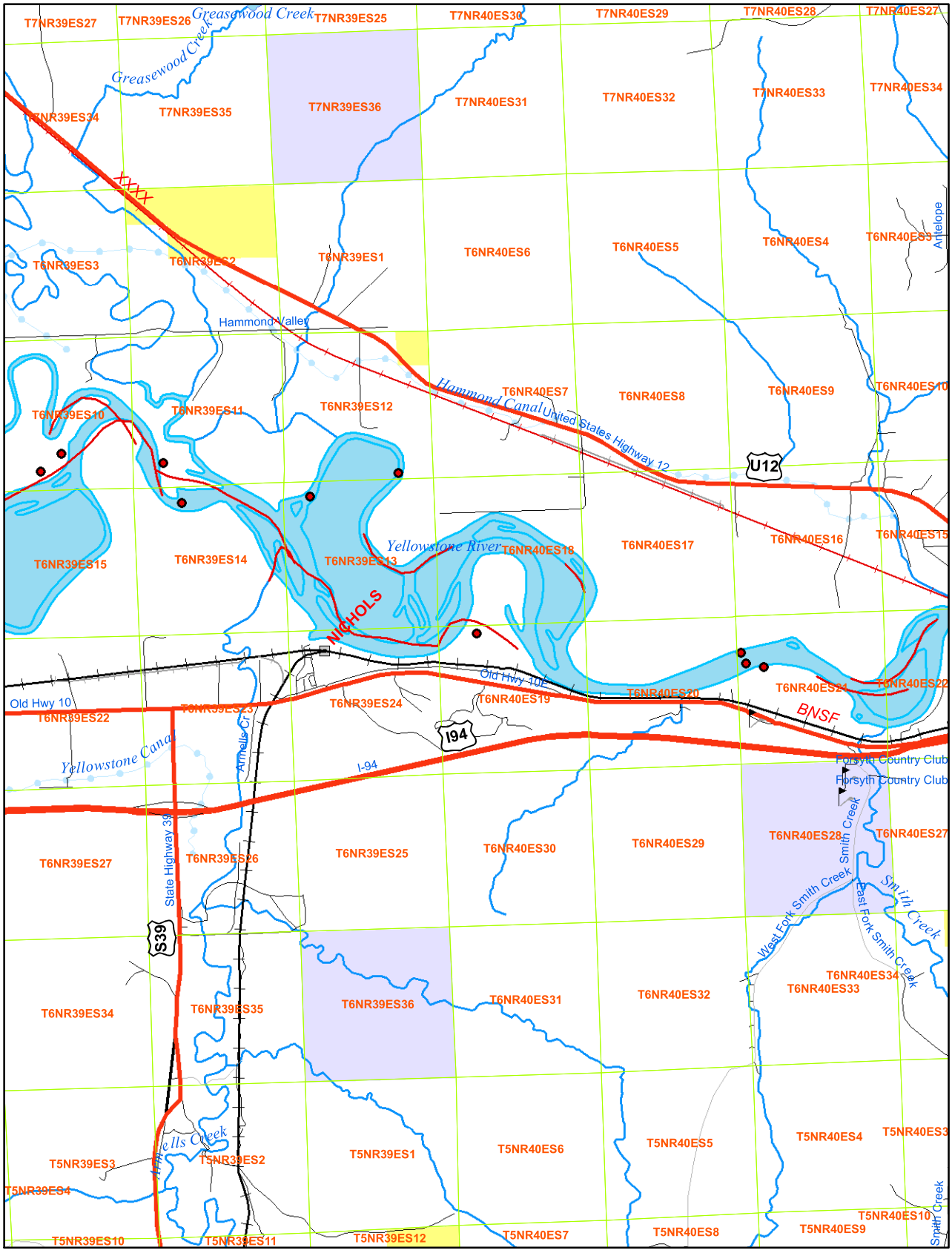
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Old Hwy 10E
Old Hwy 10
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BNSF
I94
Yellowstone Canal
Armells Cr
I-94
Forsyth Country Club
Forsyth Country Club
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West Fork Smith Creek
East Fork Smith Creek
Smith Creek
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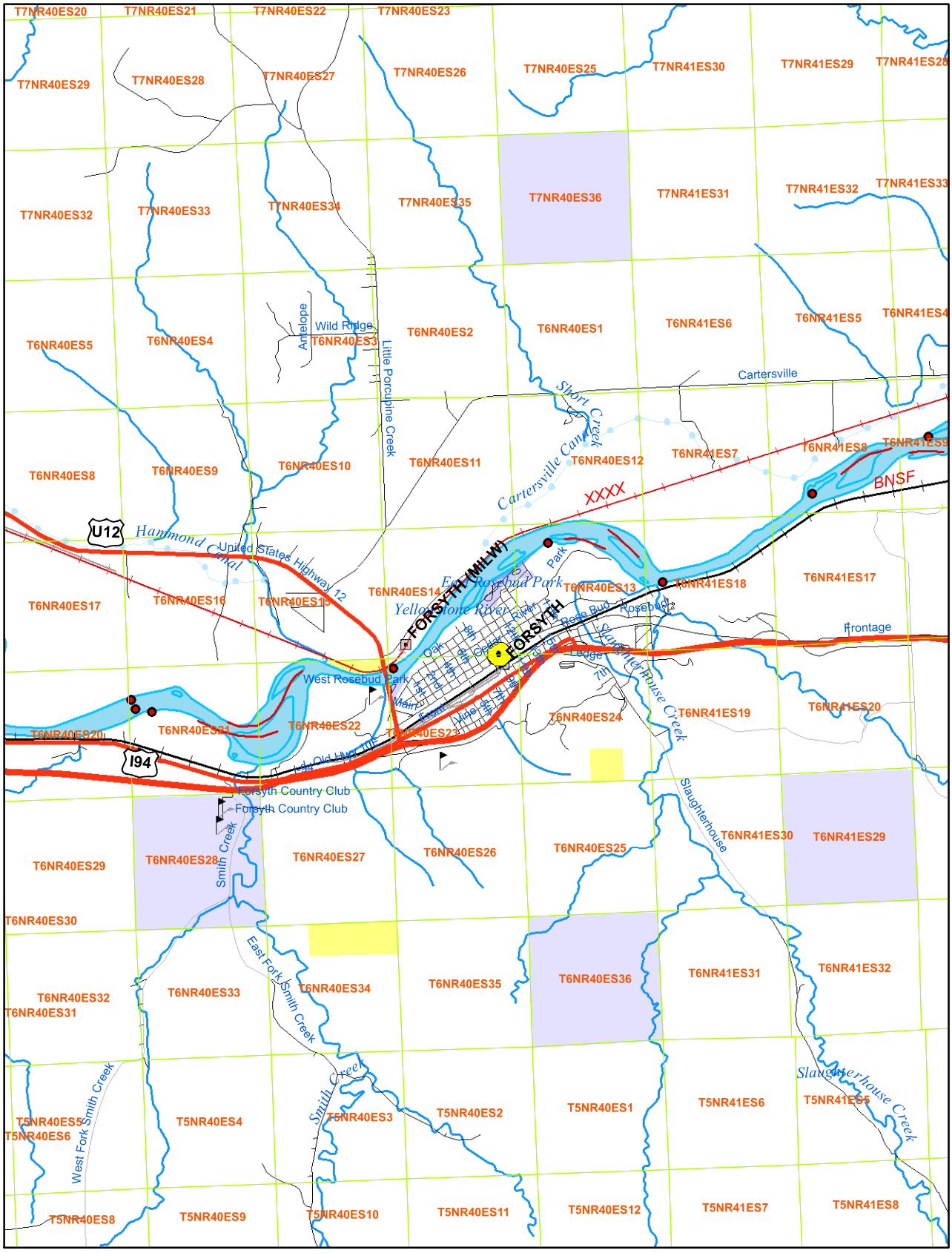
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Wild Ridge
Little Porcupine Creek
Short Creek
Cartersville
Cartersville Canal
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Yellowstone River
FORSYTH (MILW)
FORSYTH
Rose Bud
Rosebud Creek
Frontage
Oak
7th
Main
Pine
Ledge
Slaughterhouse Creek
West Rosebud Park
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Old Hwy 10E
Forsyth Country Club
Forsyth Country Club
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Smith Creek
Slaughterhouse
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Smith Creek
Slaughterhouse Creek
West Fork Smith Creek
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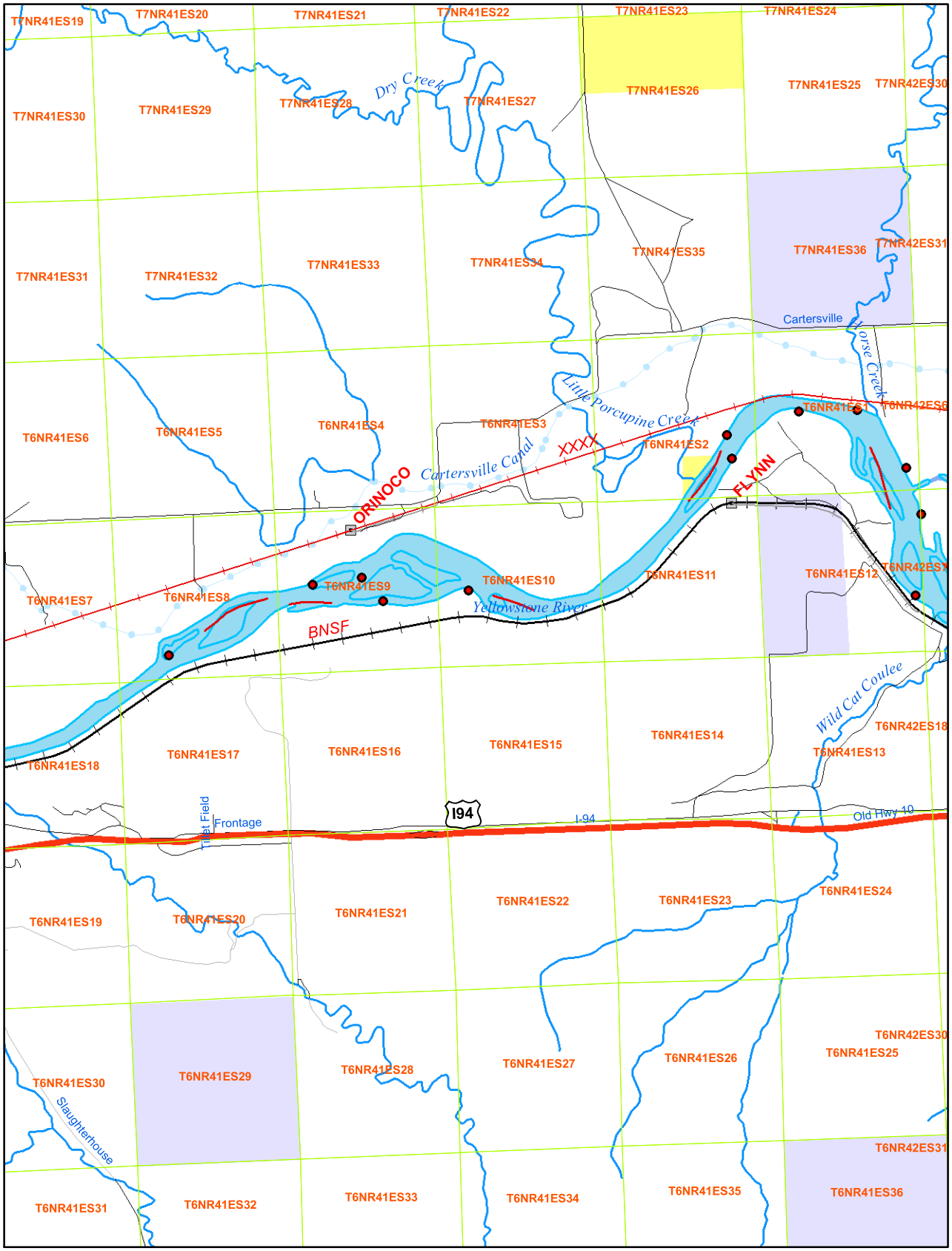
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BNSF
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I94
I-94
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Horse Creek
Old Cartersville
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Cartersville Canal
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Highway 446
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BNSF
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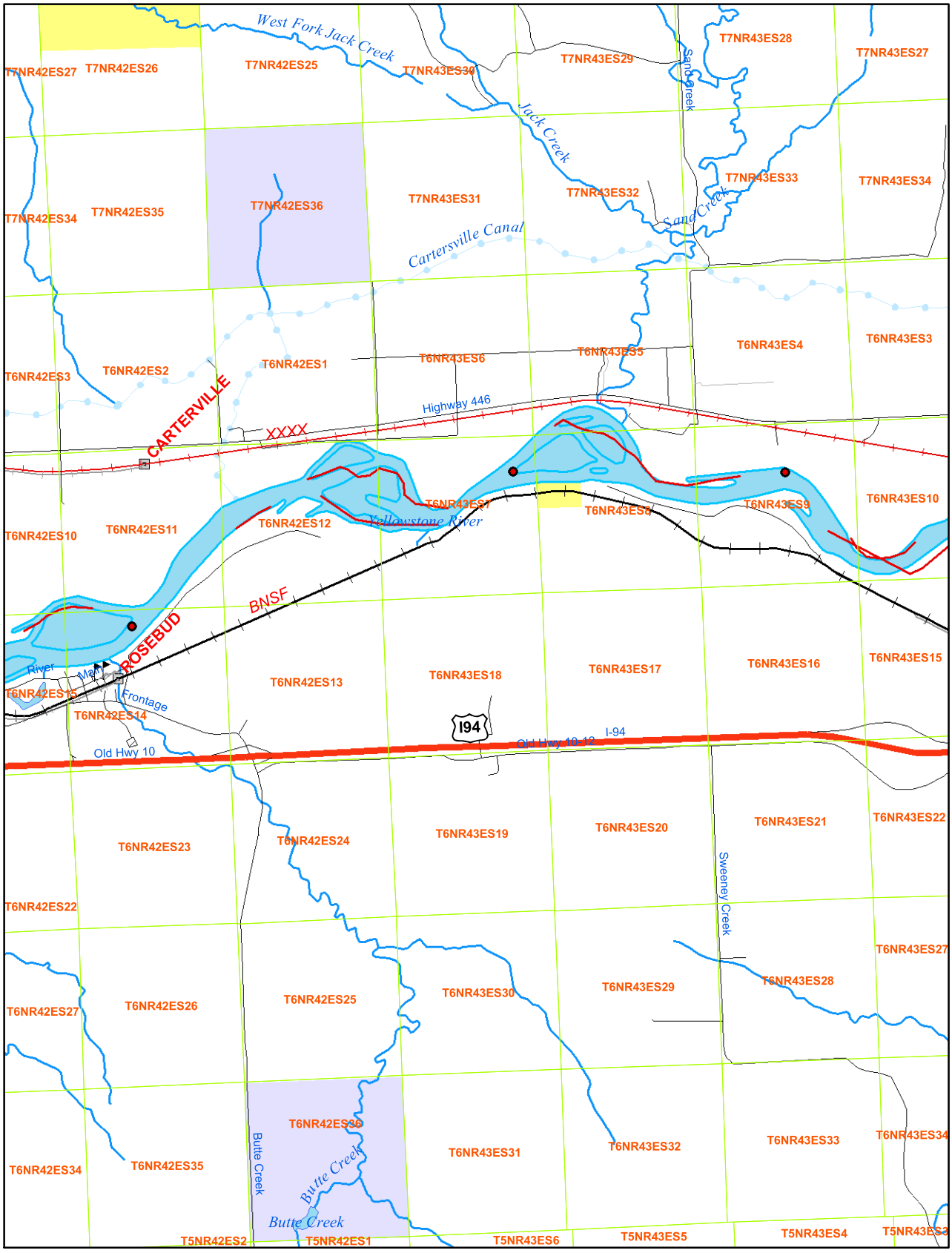
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Jack Creek
Sand Creek
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BNSF
Frontage
Old Hwy 10
I-94
Sweeney Creek
Butte Creek
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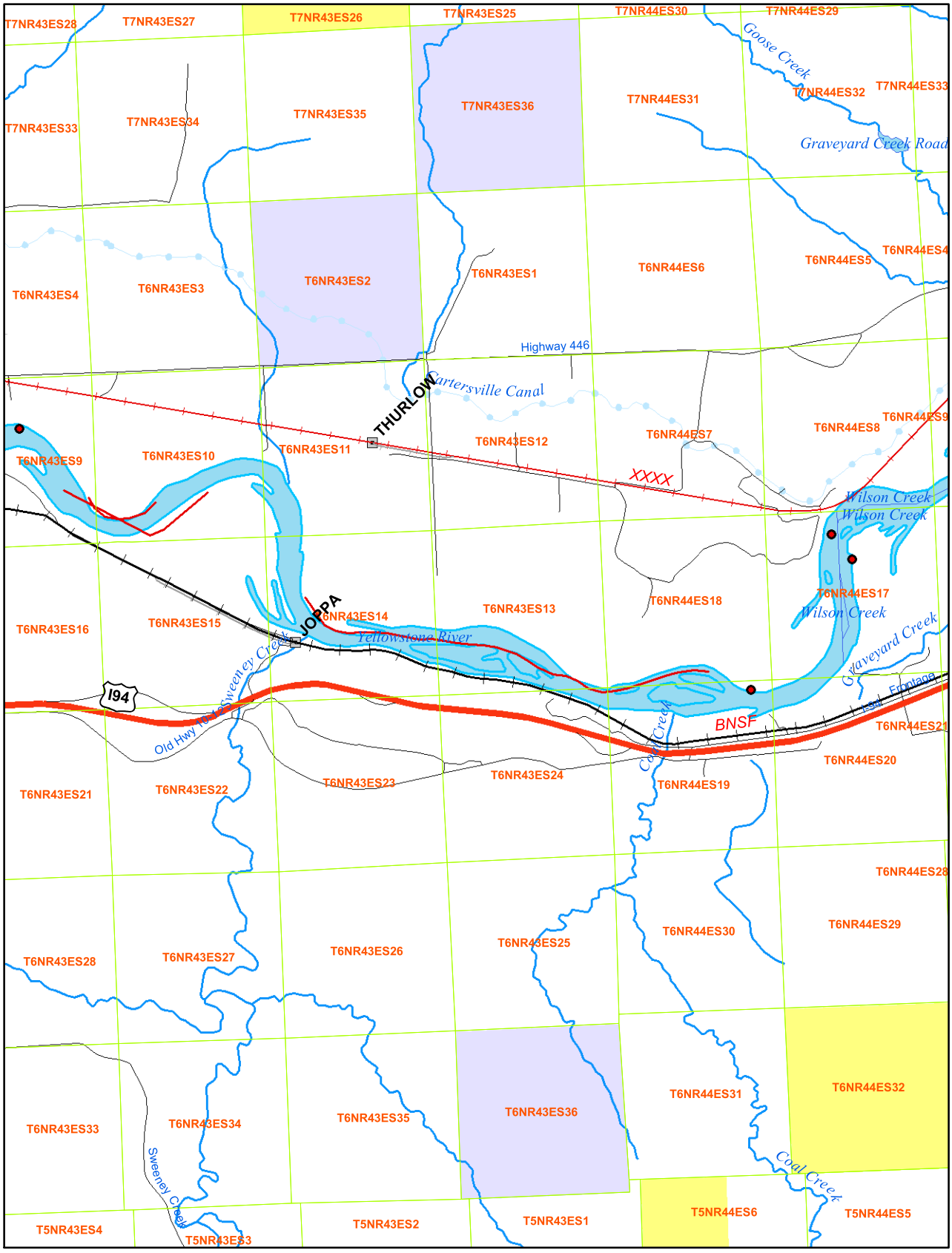
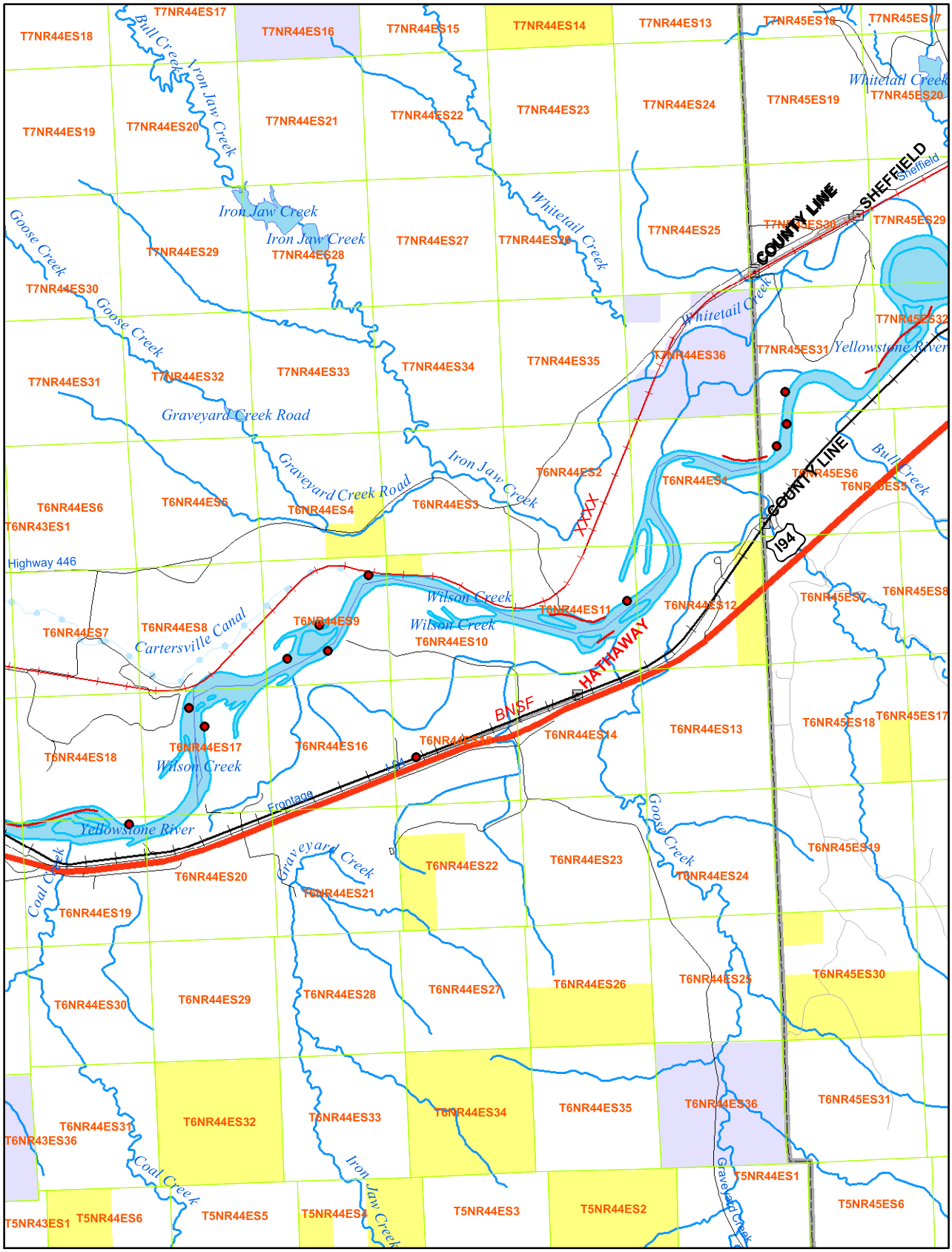


Hysham Enterprises

2000 & 2001 Helicopter
Noxious Weed
Inventory Projects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Iron Jaw Creek
Whitetail Creek
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SHEFFIELD
Sheffield
COUNTY LINE
Iron Jaw Creek
Goose Creek
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Whitetail Creek
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Graveyard Creek Road
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COUNTY LINE
Bull Creek
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Highway 446
194
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Wilson Creek
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Cartersville Canal
HATHAWAY
BNSF
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Wilson Creek
Frontage
Yellowstone River
Goose Creek
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Graveyard Creek
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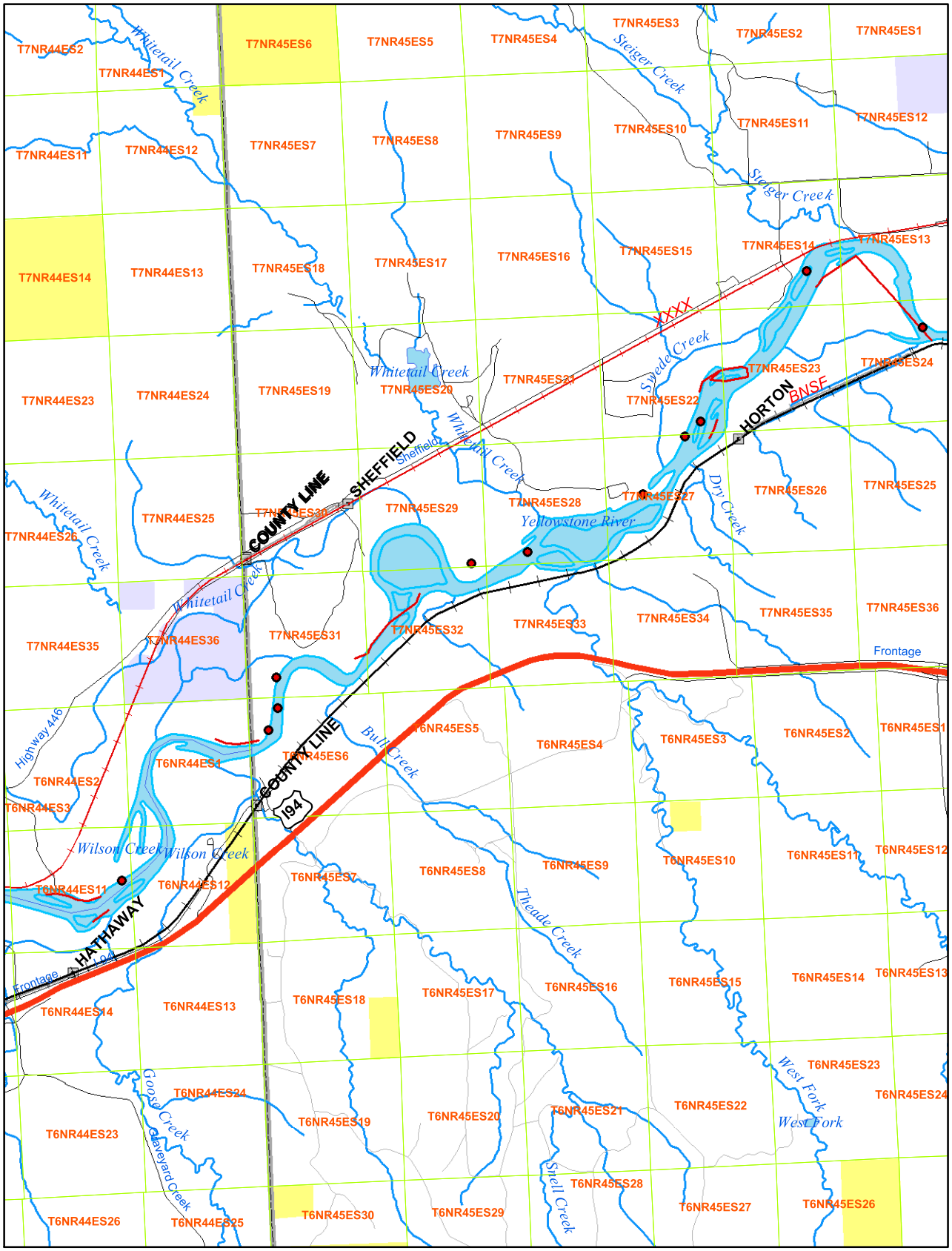
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HORTON
BNSF
SHEFFIELD
Sheffield
COUNTY LINE
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T6NR45ES6
Bull Creek
COUNTY LINE
194
Wilson Creek
Wilson Creek
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HATHAWAY
Frontage
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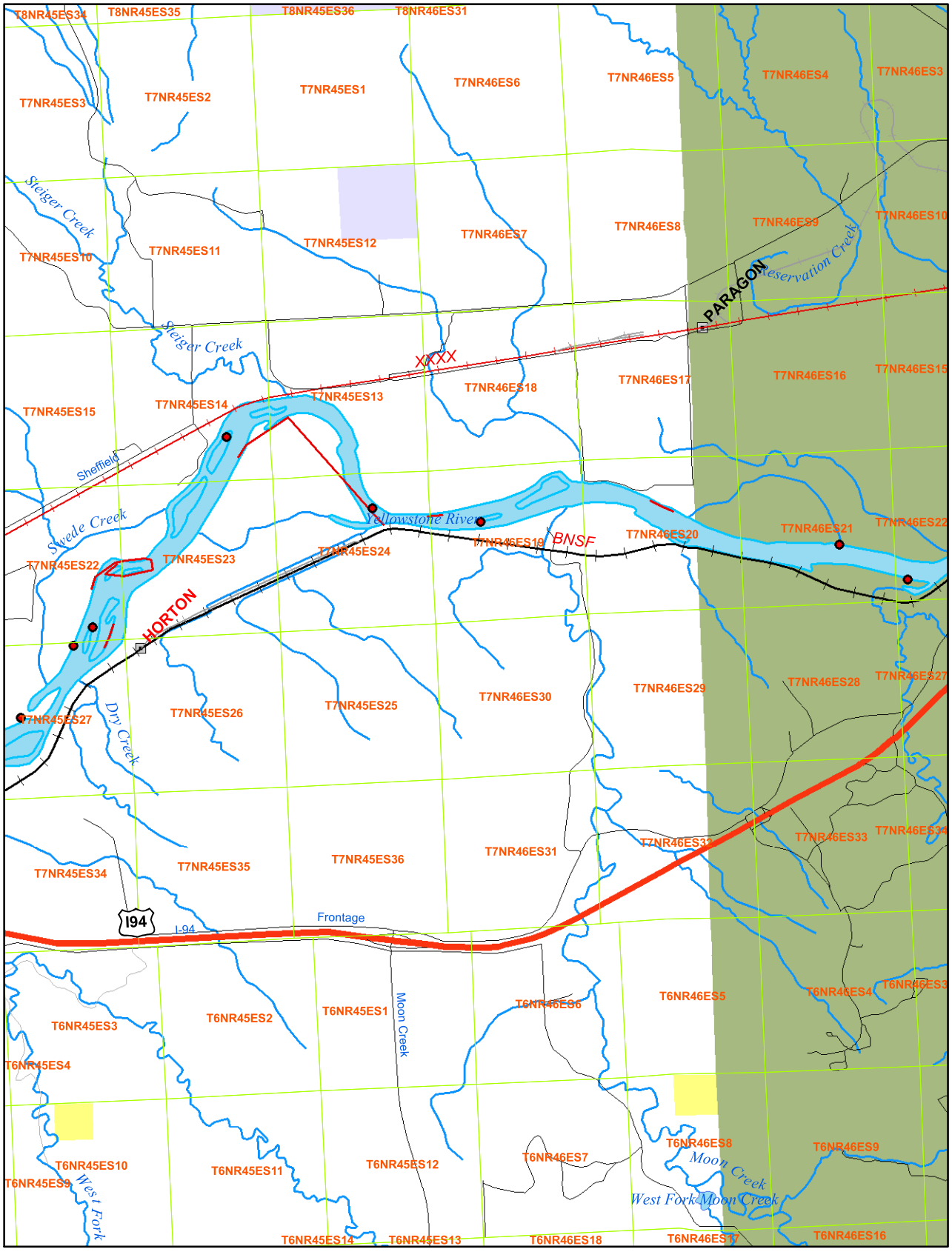
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Swede Creek
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I-94
Frontage
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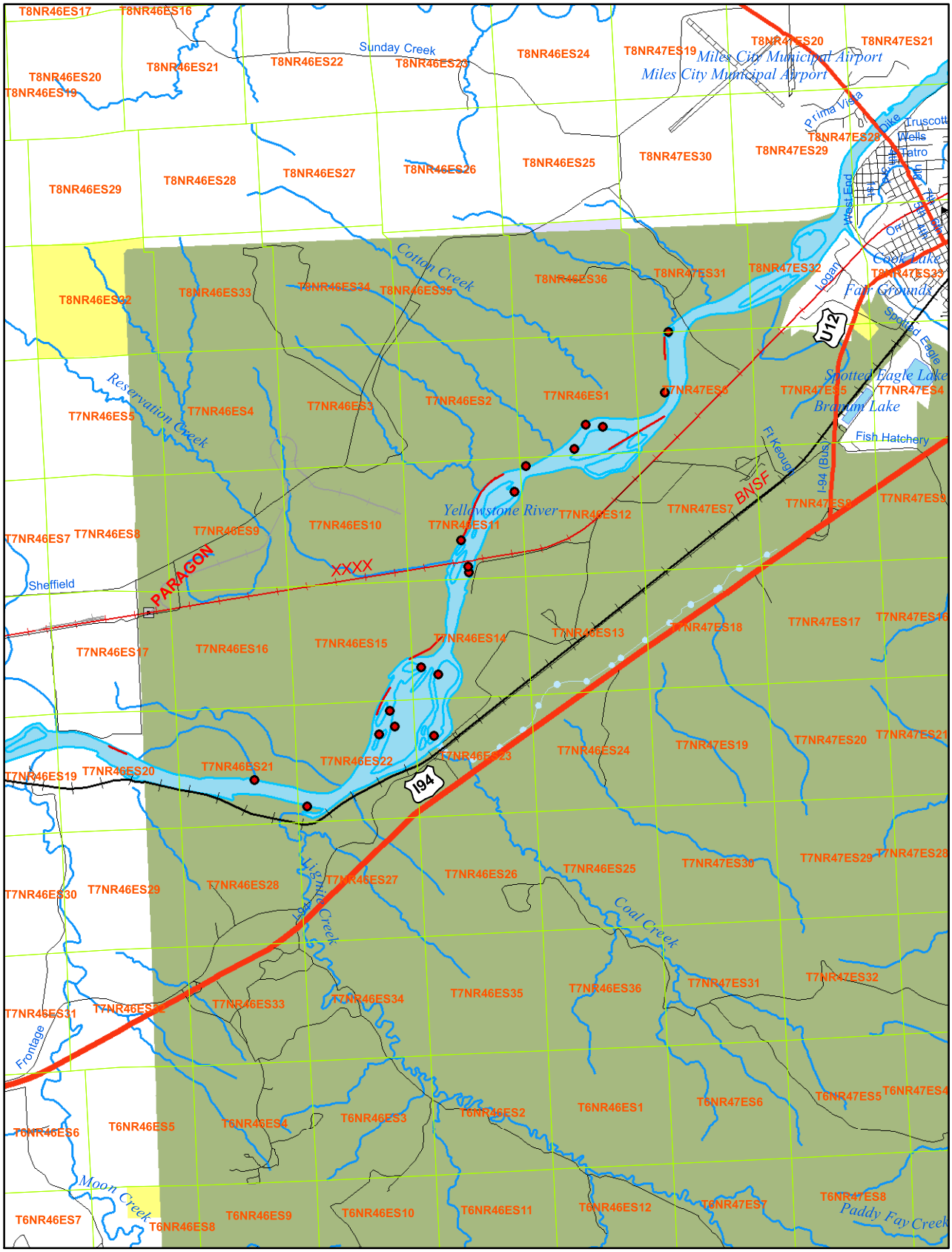
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Truscott
Wells
Patro
West End
Cook Lake
Logan
Fair Grounds
Spotted Eagle
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Braaten Lake
Fish Hatchery
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Ft Keough
I-94 (BUS)
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Coal Creek
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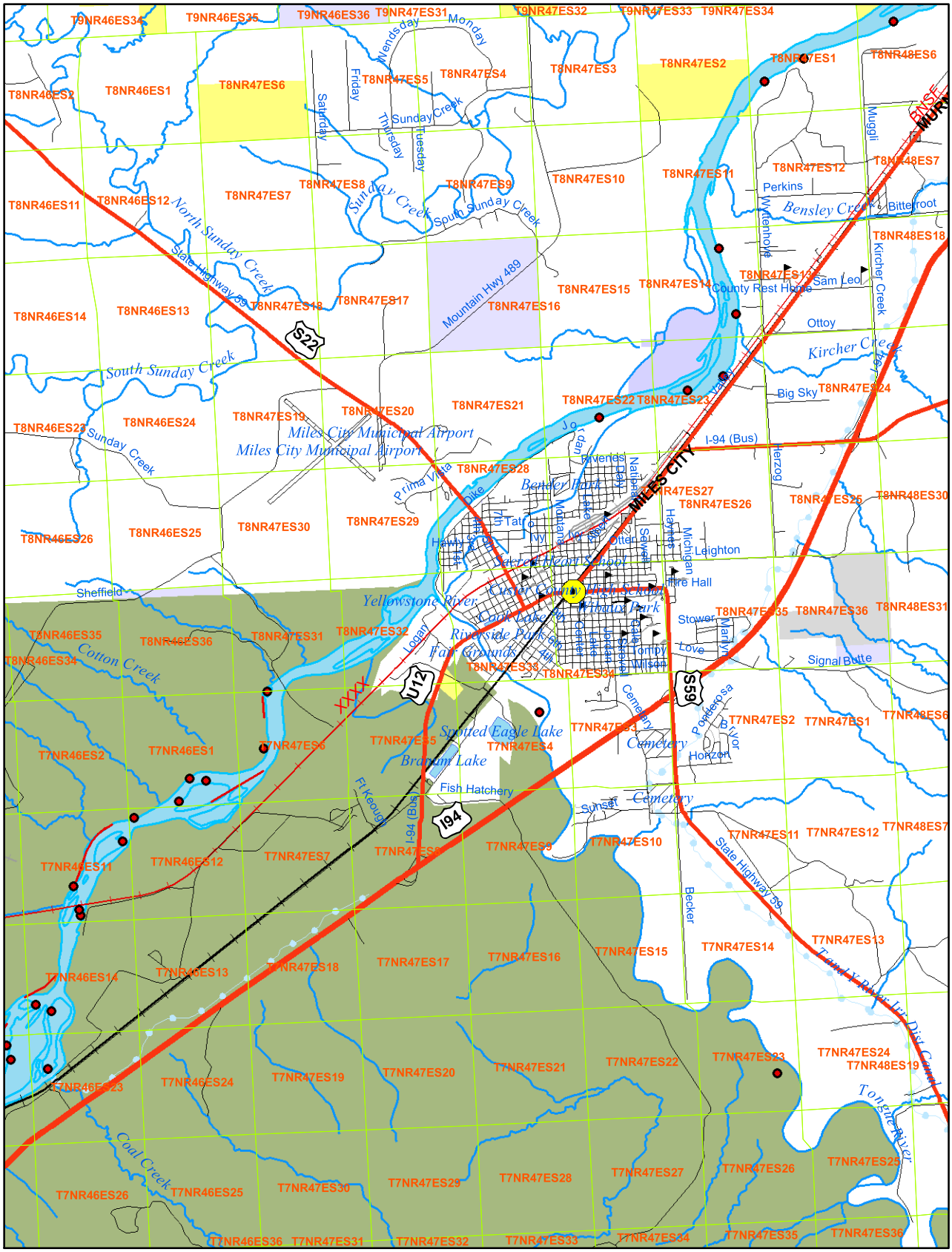
Paddy Fay Creek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Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday Creek
North Sunday Creek
South Sunday Creek
Mountain Hwy 489
State Highway 59
Miles City Municipal Airport
Prima Vista Dike
Bender Bend
MILES CITY
I-94 (Bus)
Yellowstone River
Cotton Creek
Coal Creek
Spotted Eagle Lake
Braham Lake
Fish Hatchery
Riverside Park
Fair Grounds
Cemetery
Sunset Cemetery
Leighton
Fire Hall
Signal Butte
Stower
Love
Perkins
Bensley Creek
Bitterroot
Muggli
Wittenholder
Sam Leo
County Rest Home
Ottoy
Kircher Creek
Big Sky
Herzog
Sheffield
Tongue River
Tongue River Irr Dist Canal
Becker
Horzen
Fi Keough
Logan
Poplar River
Mainline
Michigan
Haynes
Otter
Wilson
Pine
Ivy
Tatro
Jordan
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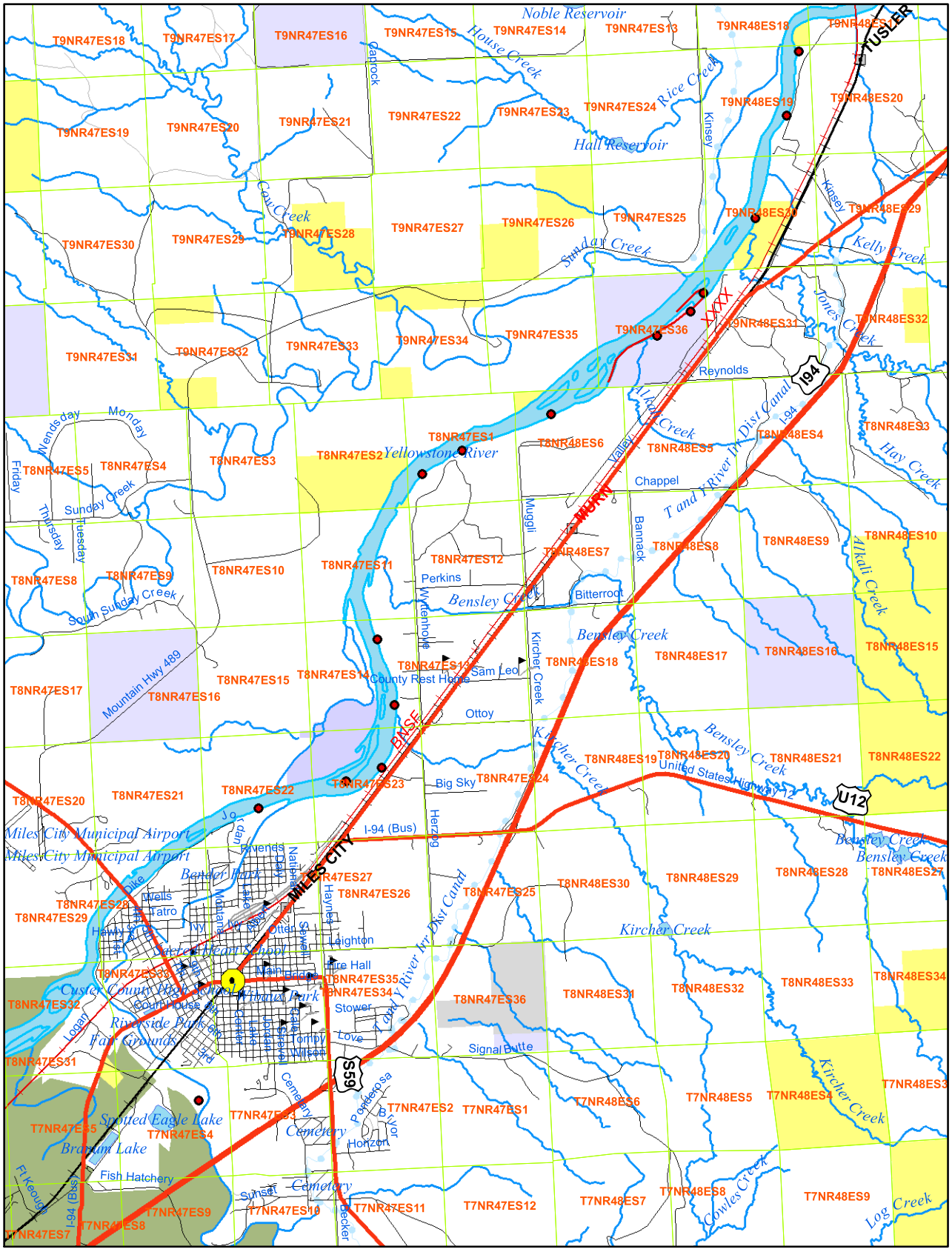
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Rice Creek
Kinsey
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Cow Creek
Sunday Creek
Kelly Creek
Jones Creek
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T and Y River Irr Dist Canal
Hay Creek
Yellowstone River
Valley
MURN
Chappel
Muggli
Bannack
Perkins
Bensley Creek
Bitterroot
Wyrtenhole
Kircher Creek
Sam Leo
County Rest Home
Ottoy
BNSF
Big Sky
United States Highway 12
U12
Herzog
I-94 (Bus)
MILES CITY
Miles City Municipal Airport
Bender Park
Riverside Park
Fair Grounds
Custer County Pioneer Museum
Custer County Art Center
Fire Hall
Stower
Love
Signal Butte
Haynes
Leighton
Otter
Spotted Eagle Lake
Braaten Lake
Fish Hatchery
Cemetery
Horizon
Sunset
Ft Keough
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Cowles Creek
Becker
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Big Dry
S59
TUSLER
XXX
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South Sunday Creek
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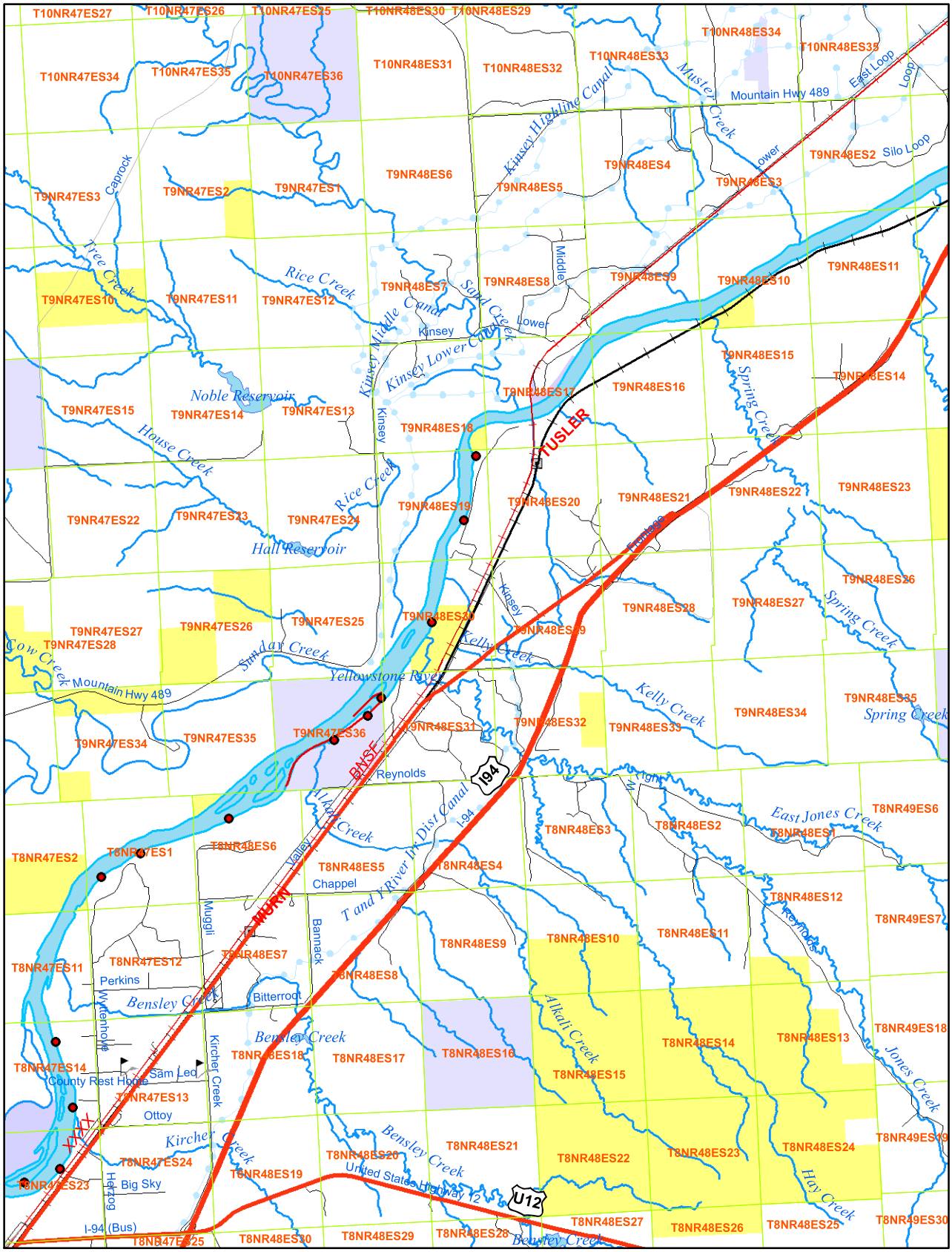
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Muster Creek
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Loop
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Lower
Tree Creek
Rice Creek
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Lower
Kinsey Middle Canal
Kinsey Lower Canal
Kinsey
Noble Reservoir
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House Creek
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TUSLER
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I94
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Valley
T and Y River Irr. Dist Canal
I-94
East Jones Creek
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Herrog
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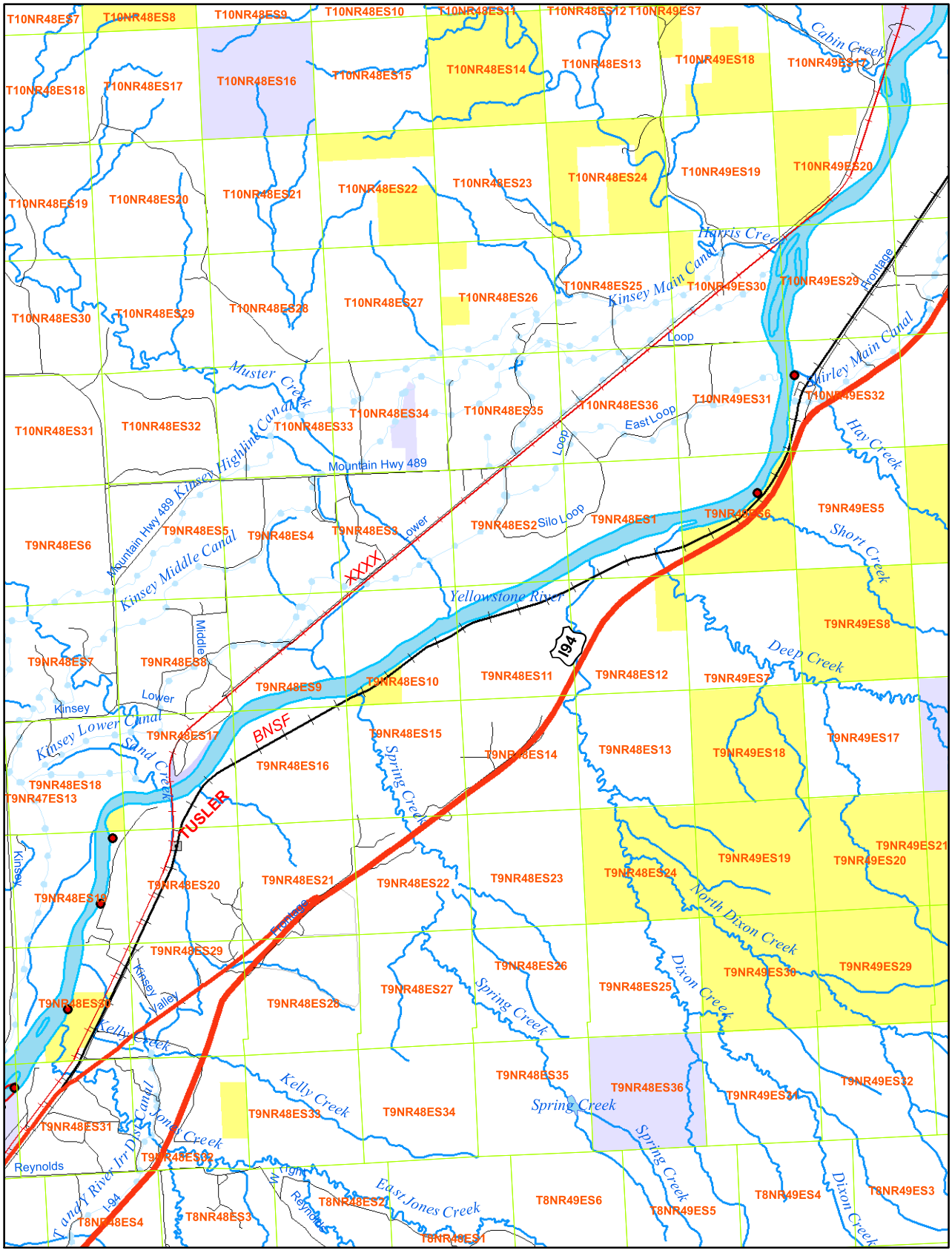
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Harris Creek
Kinsey Main Canal
Loop
Frontage
Shirley Main Canal
Muster Creek
Kinsey Highline Canal
Mountain Hwy 489
East Loop
Hay Creek
Kinsey Middle Canal
Lower
Silo Loop
Short Creek
Yellowstone River
Middle
Deep Creek
Kinsey
Kinsey Lower Canal
Sand Creek
BNSF
TUSLER
Spring Creek
Kinsey
Frontage
North Dixon Creek
Dixon Creek
Kinsey Valley
Kelly Creek
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Jones Creek
Reynolds
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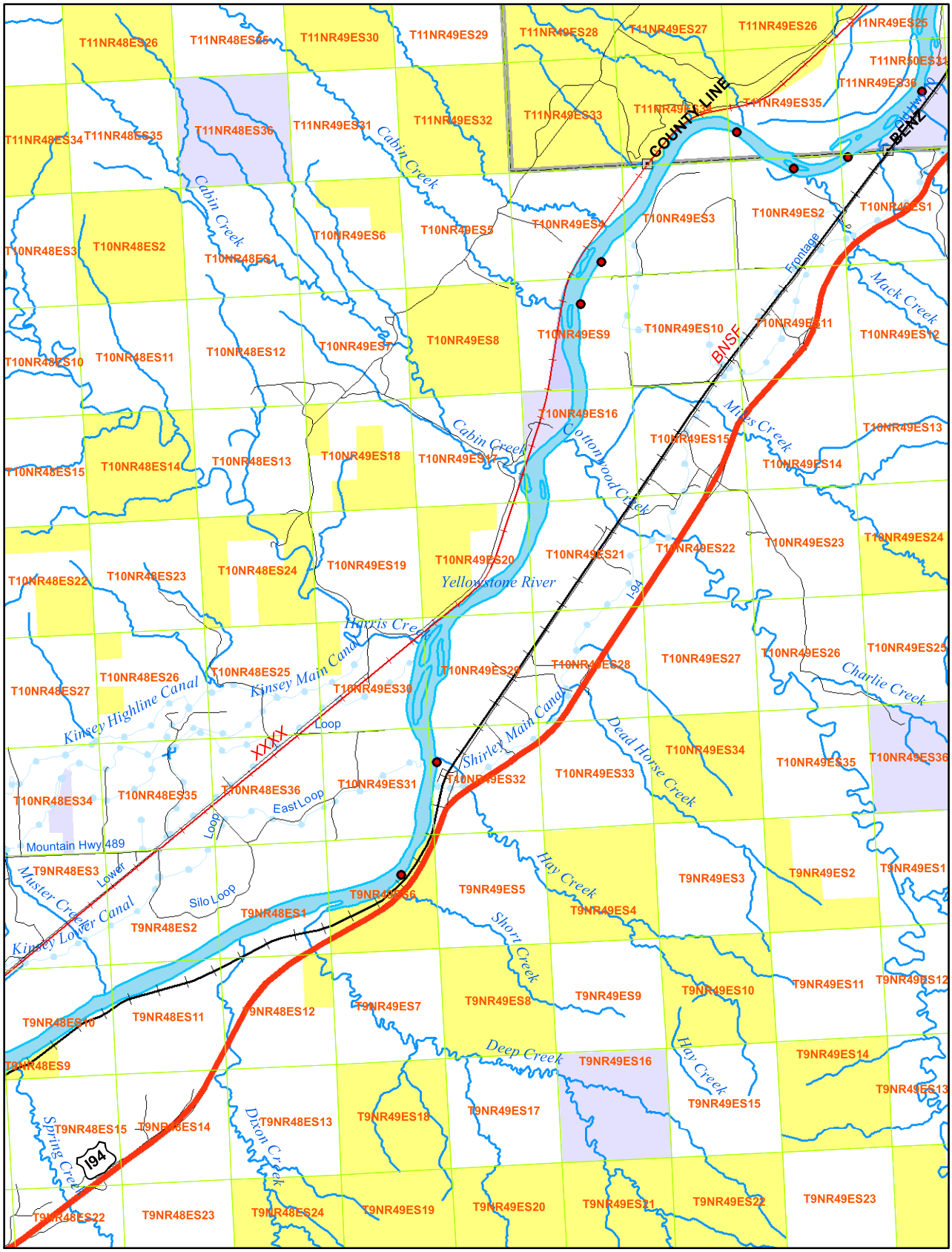
East Jones Creek
I-94
94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Kinsey Highline Canal
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Master Creek
Kinsey Lower Canal
Silo Loop
Hay Creek
Short Creek
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Dixon Creek
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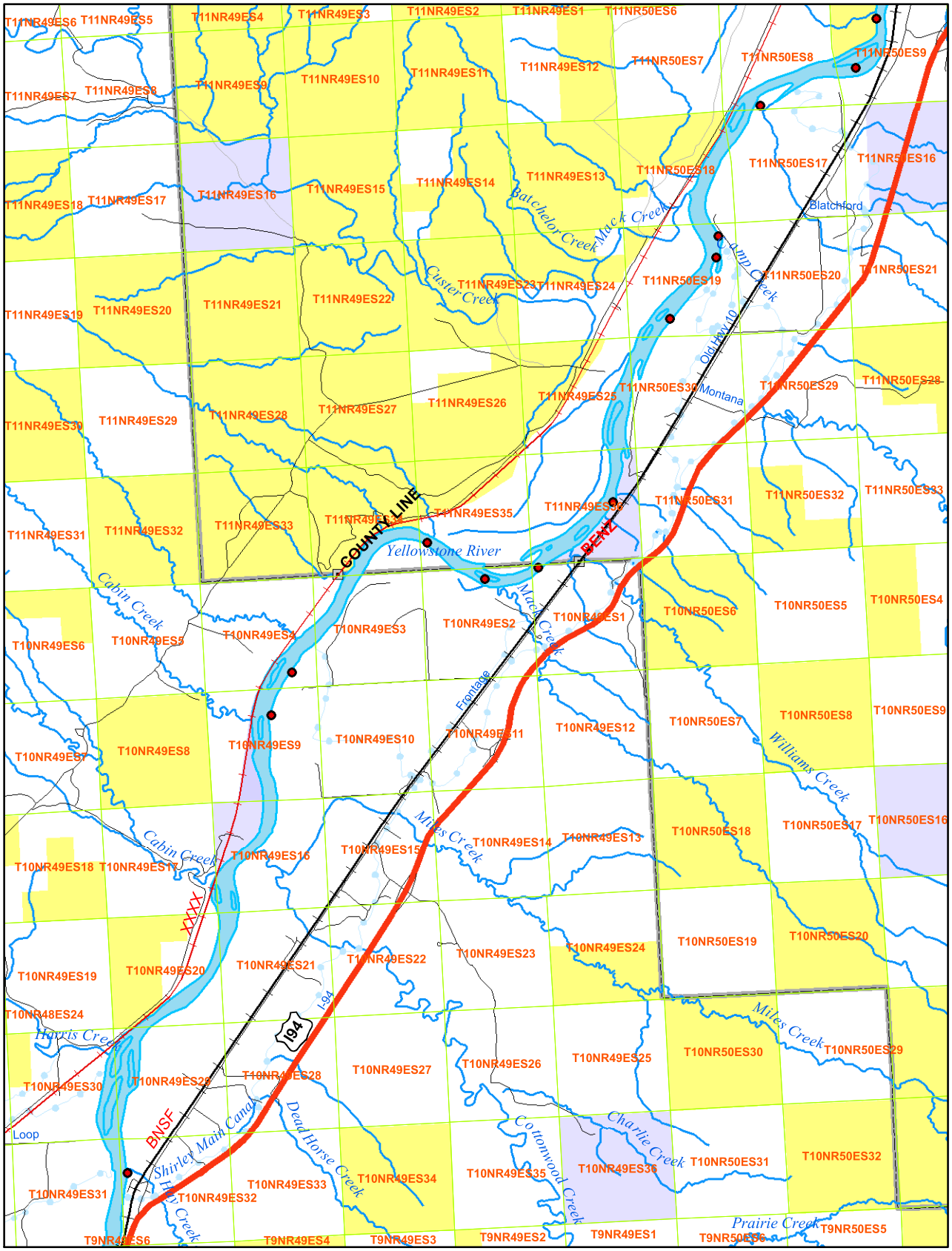
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I-94
194
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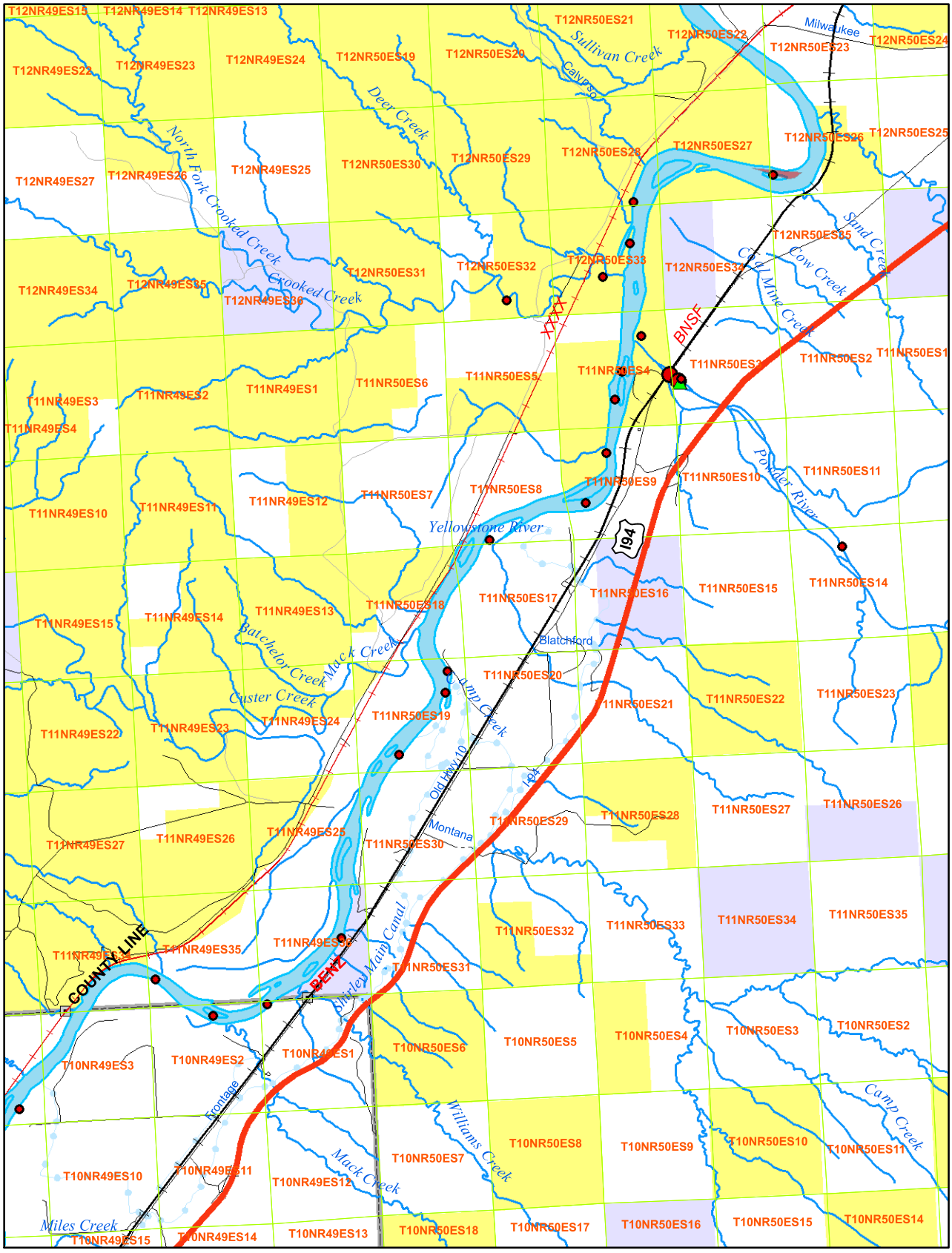
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North Fork Crooked Creek
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Yellowstone River
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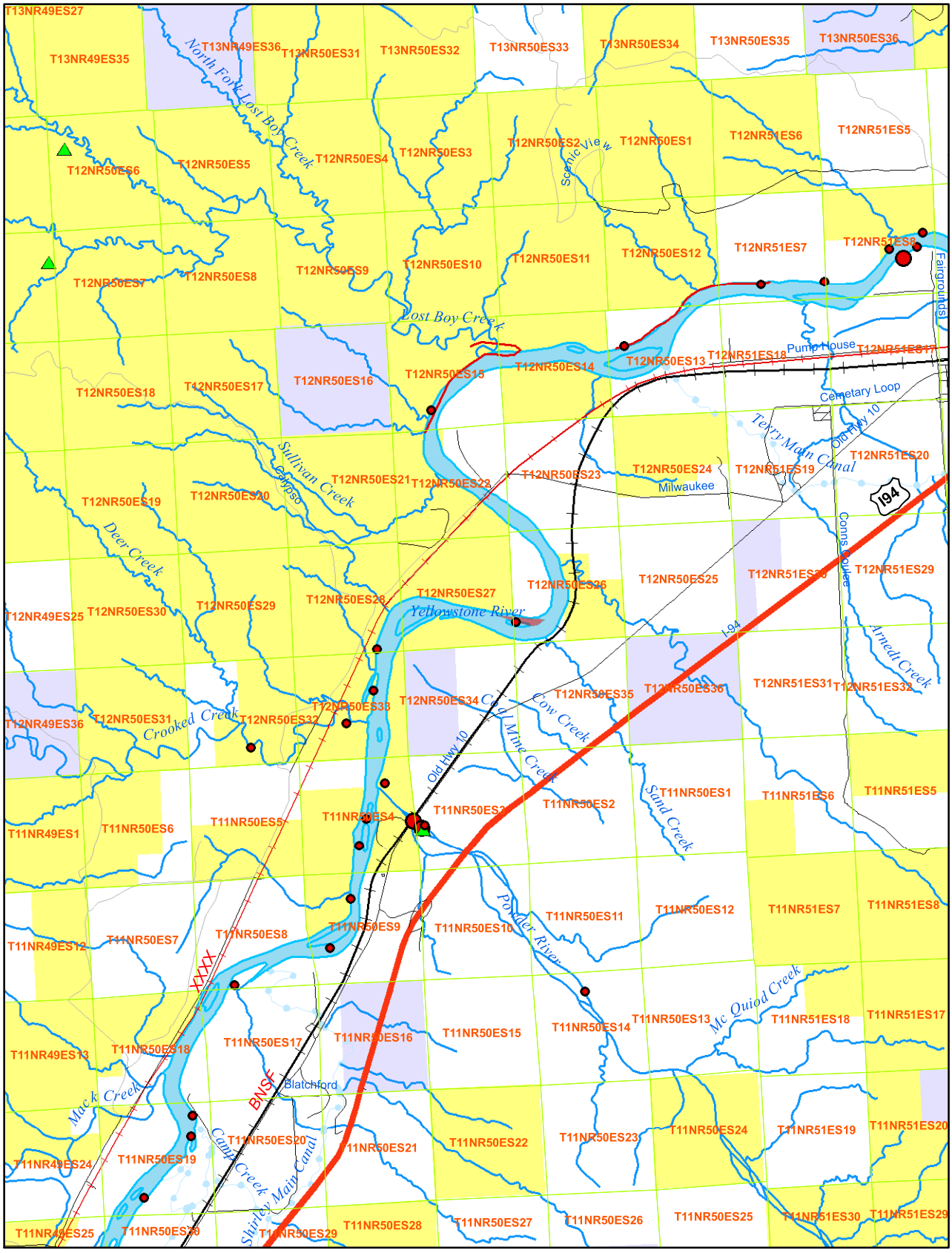
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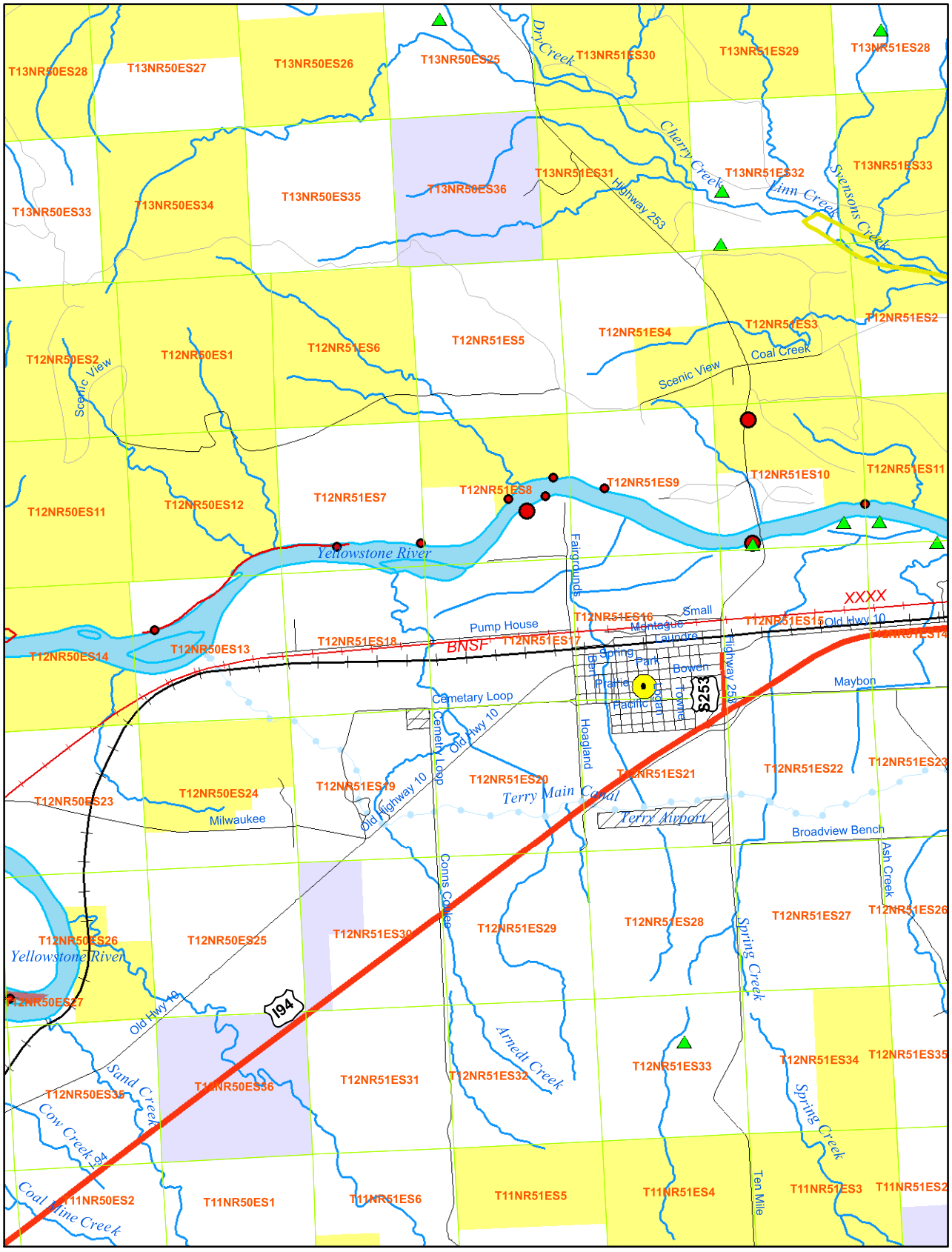
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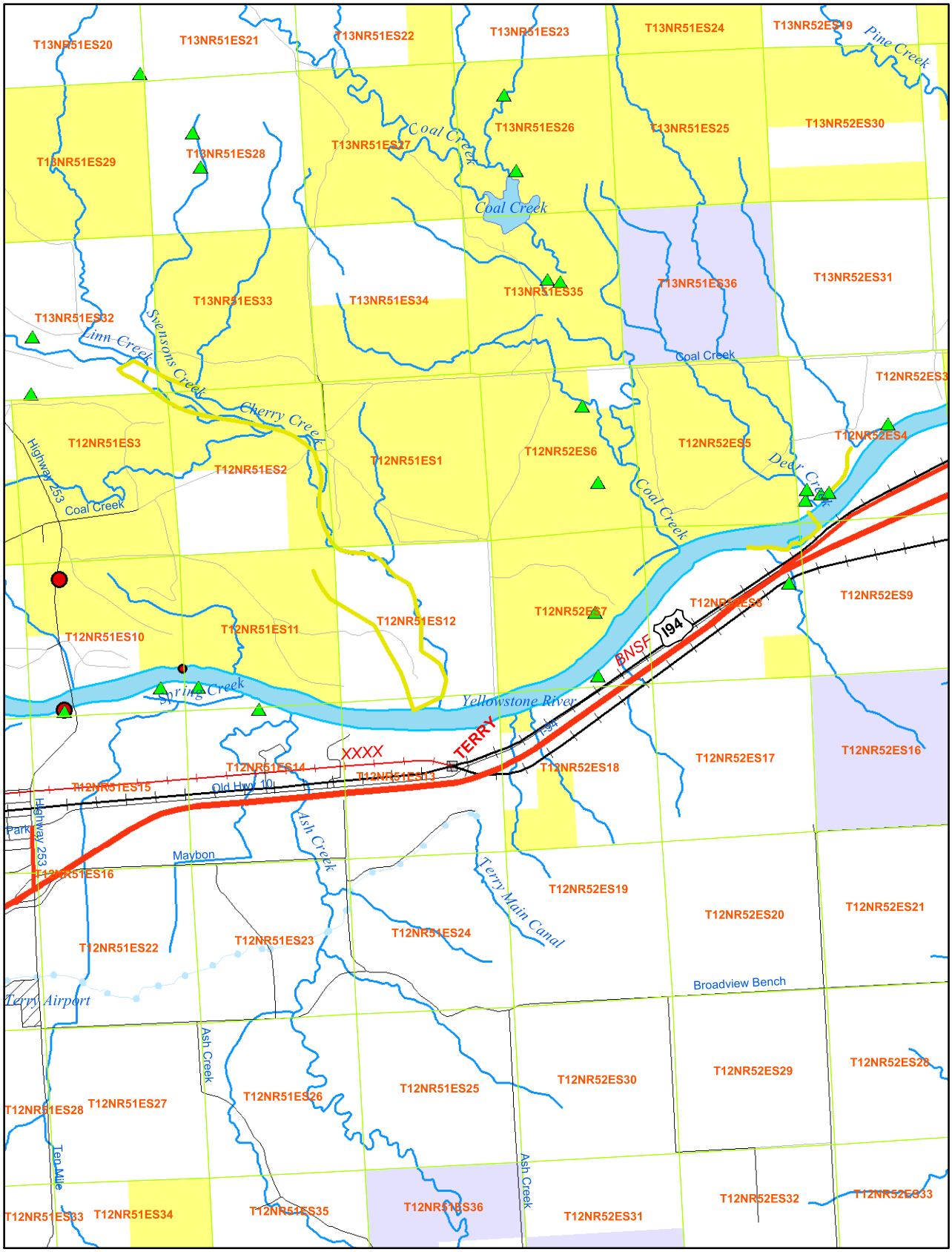
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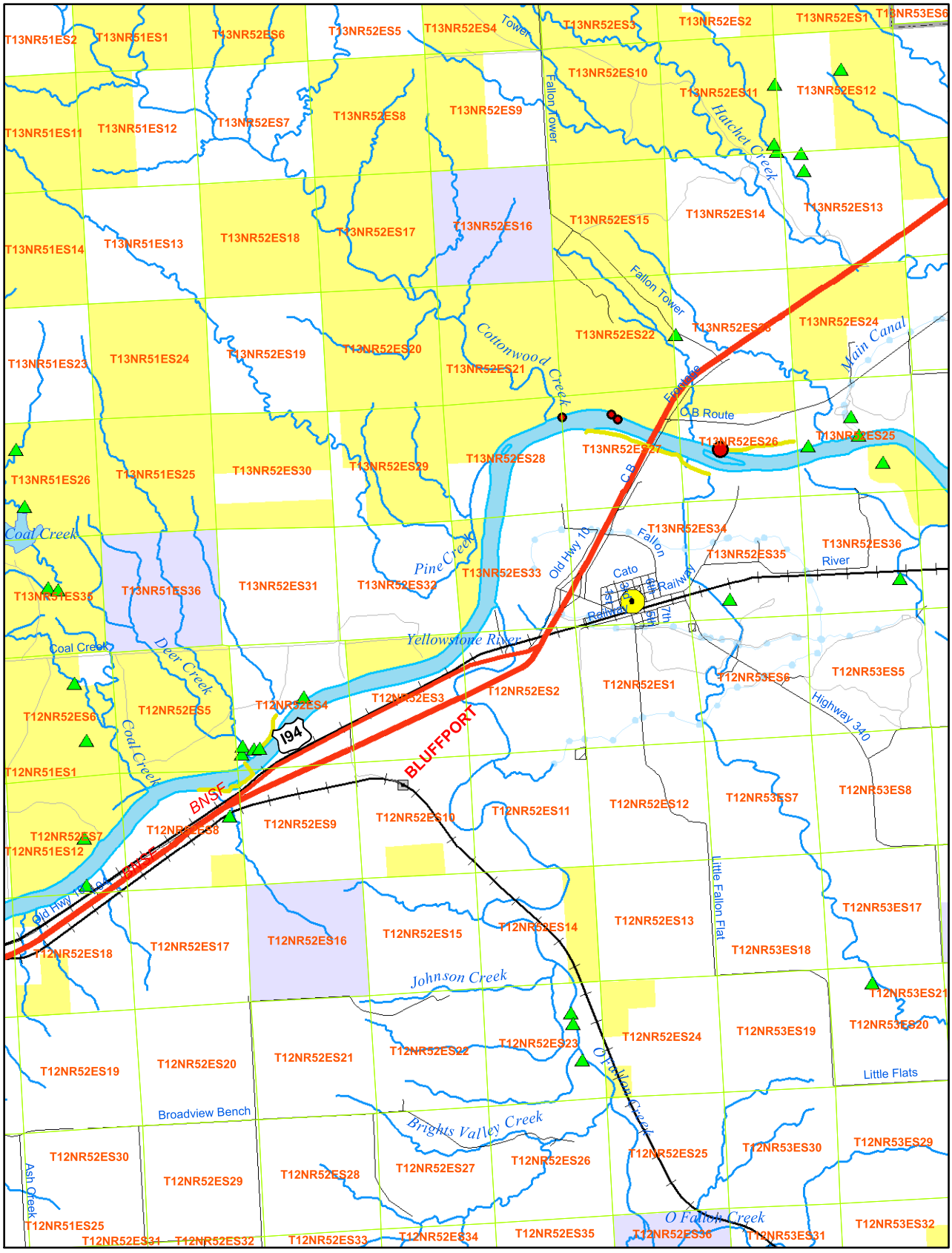
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Cato
Railway
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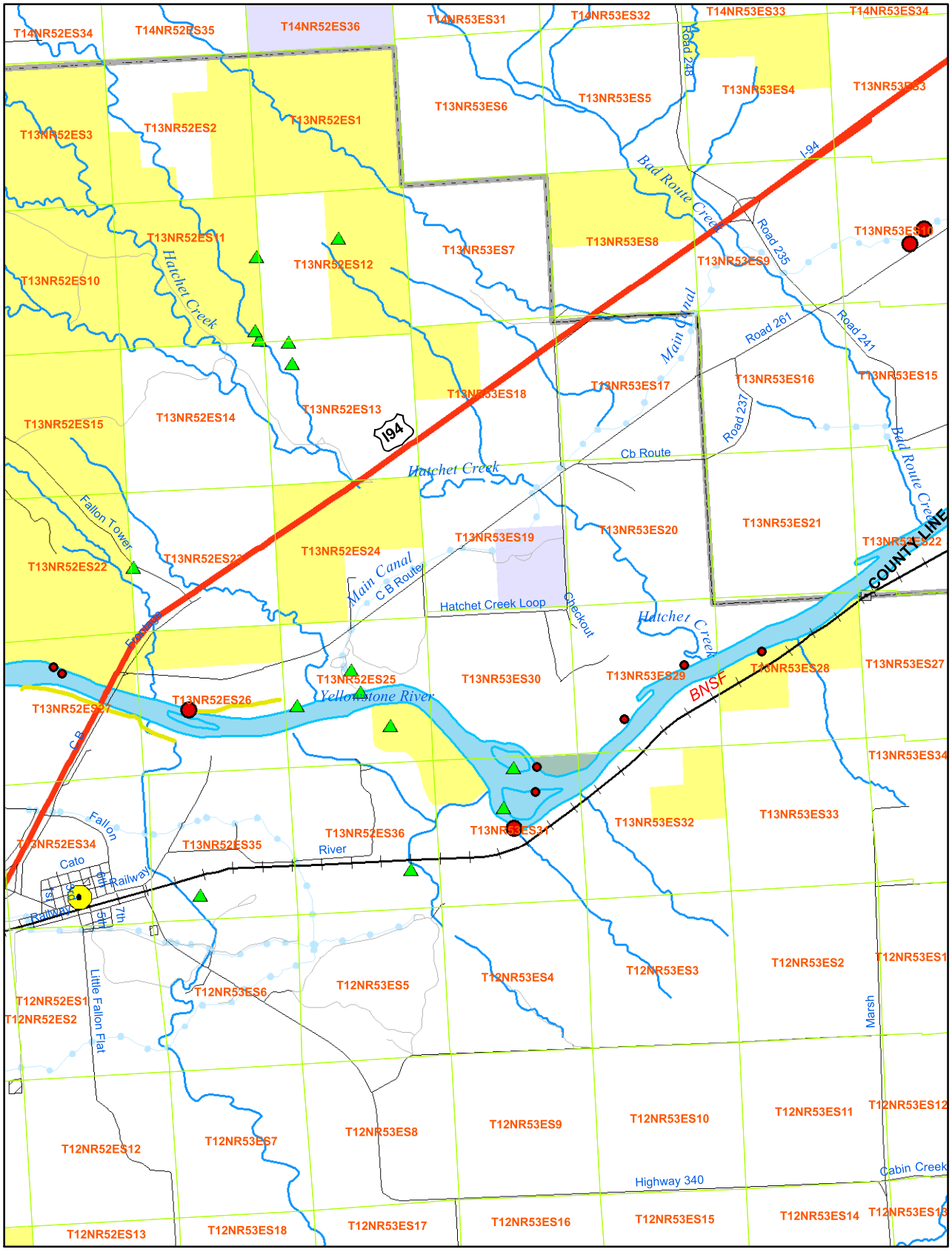
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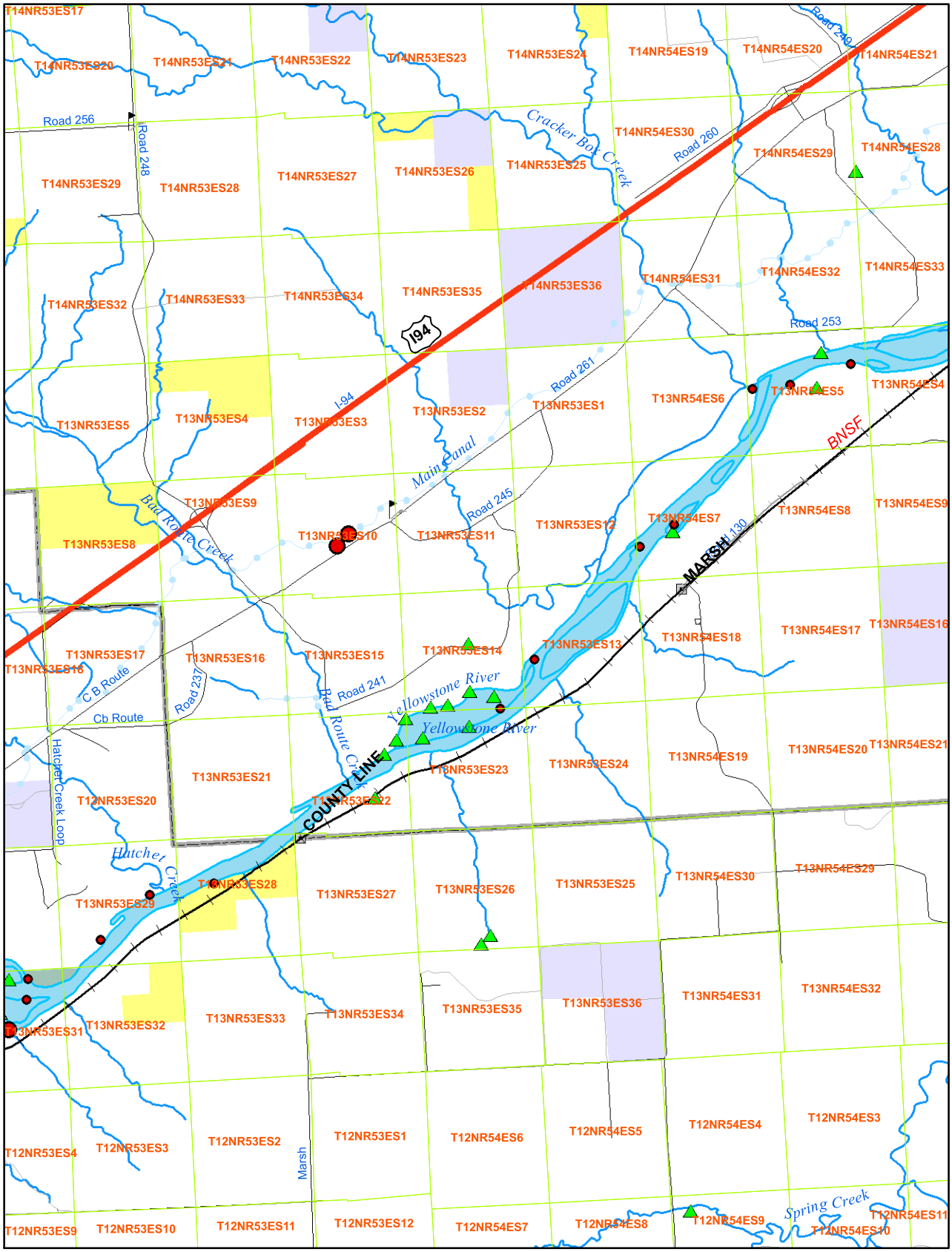
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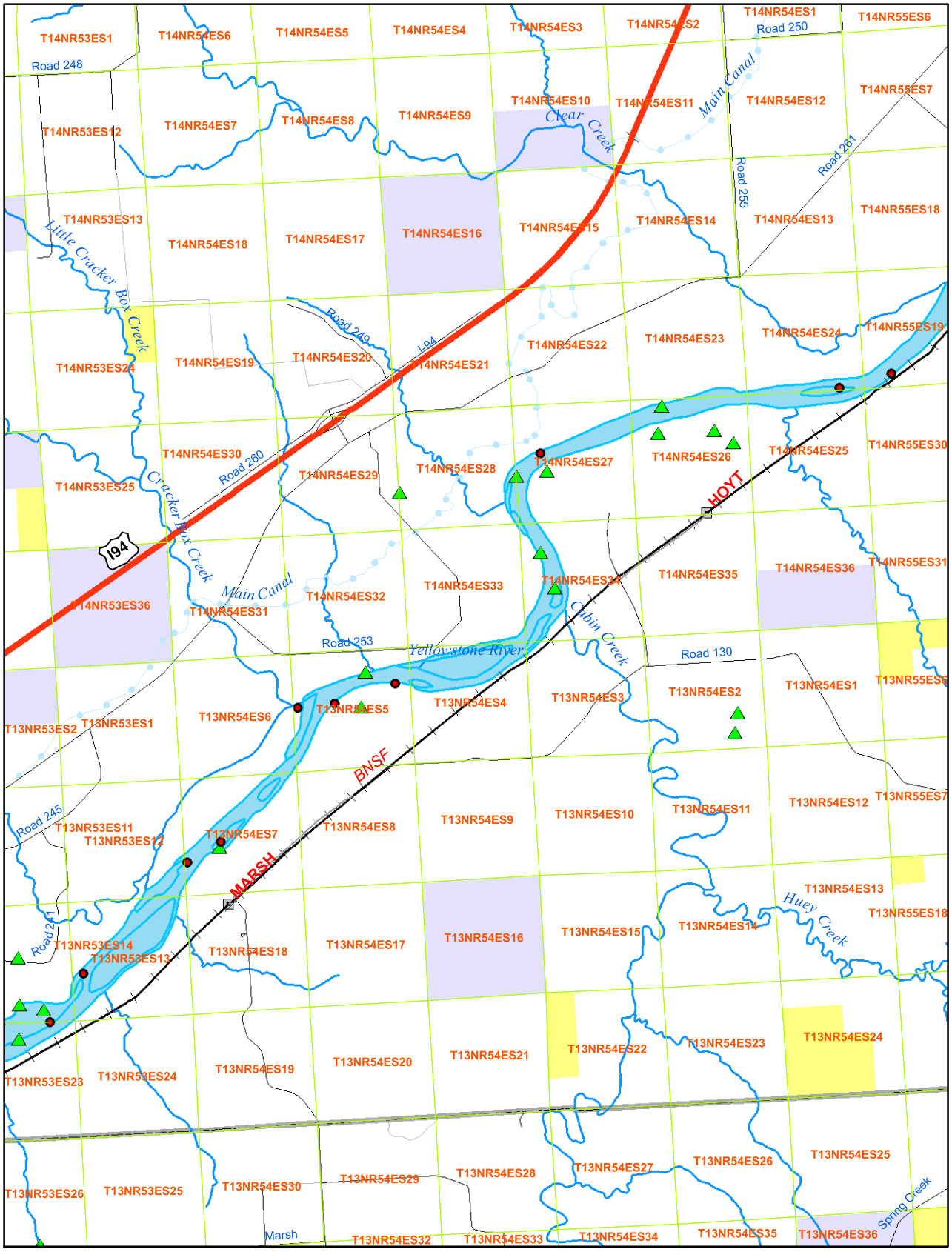
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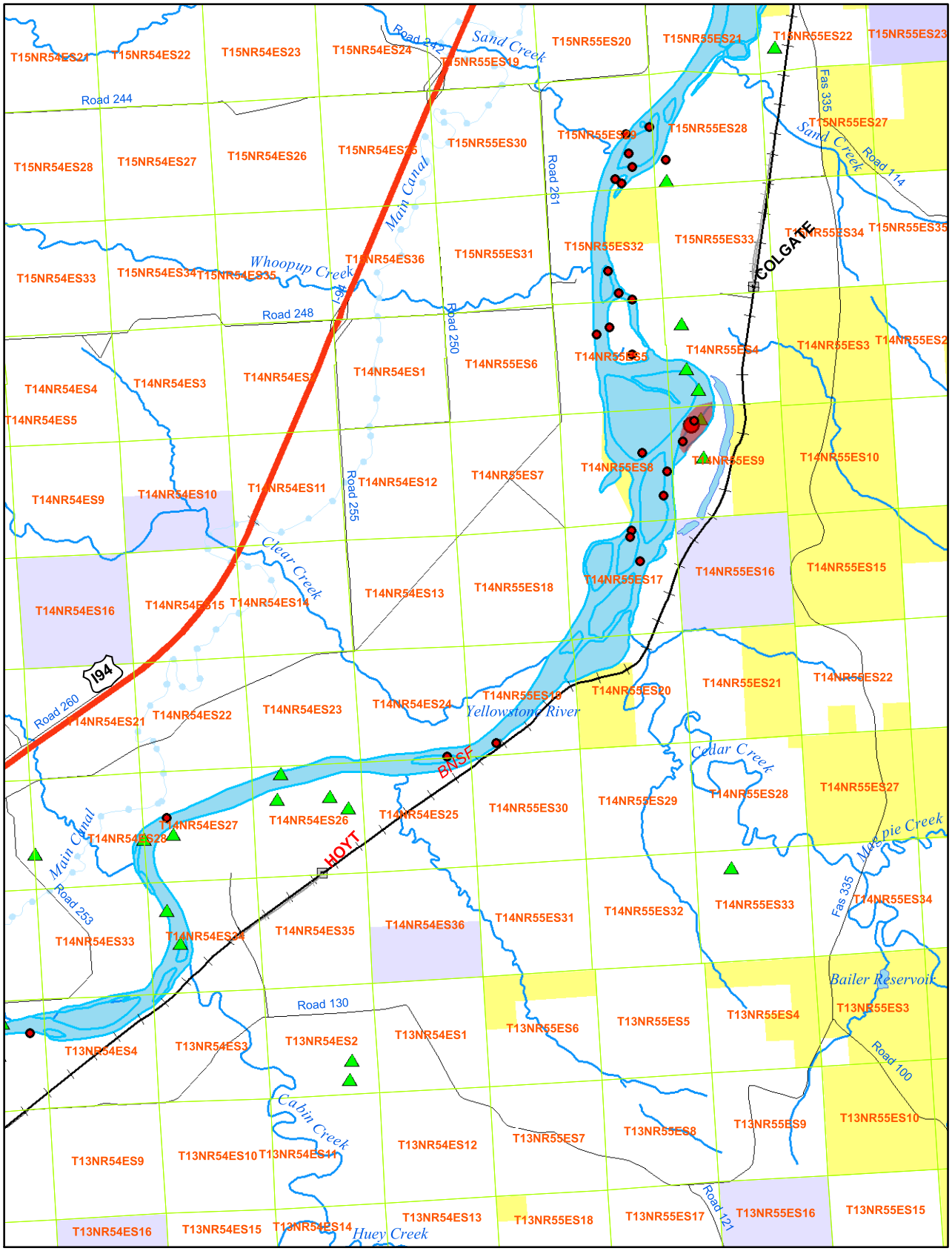
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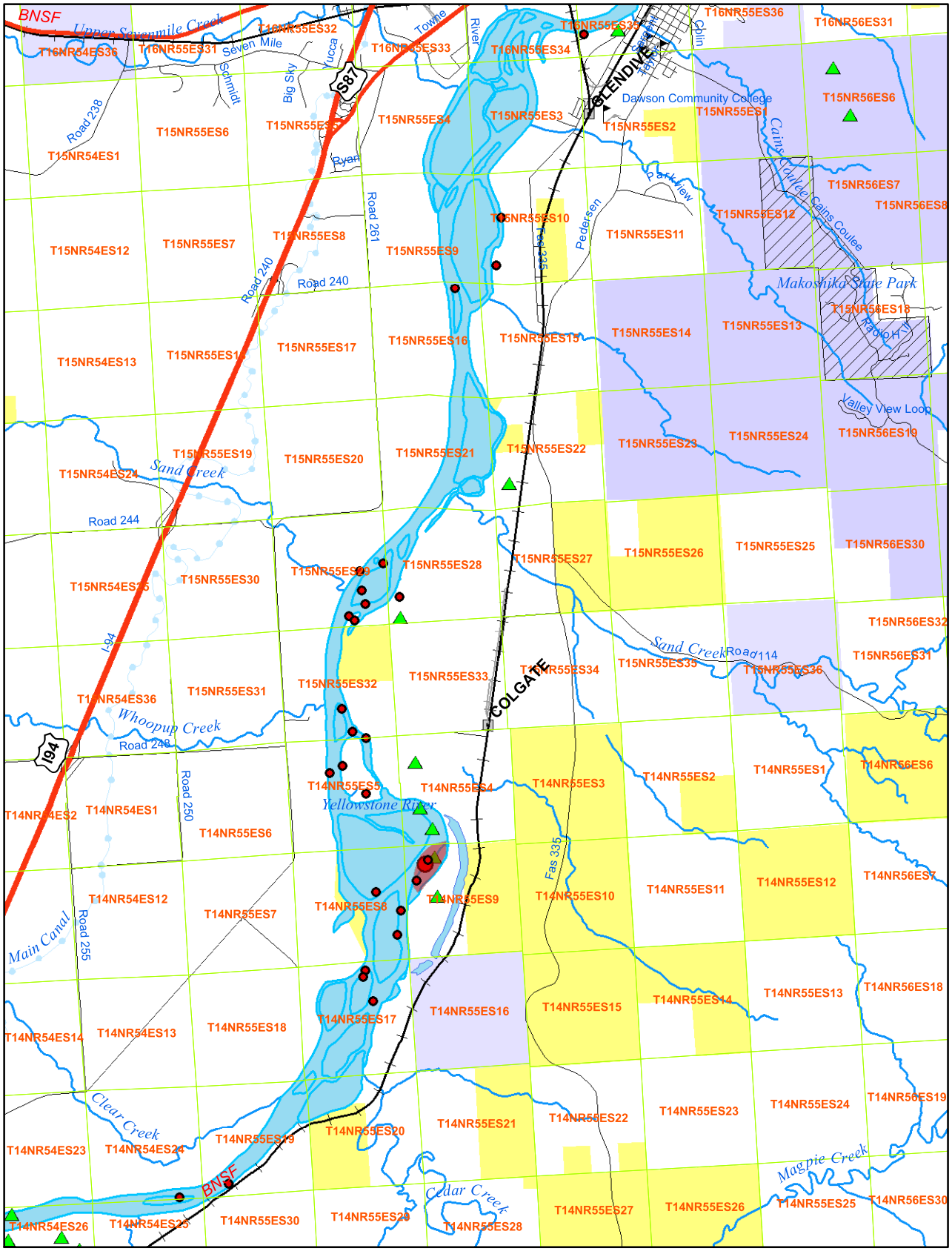
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Dawson Community College
Makoshika State Park
Yellowstone River
Sand Creek
Whoopup Creek
Clear Creek
Cedar Creek
Magpie Creek
Main Canal
Seven Mile
Upper Sevenmile Creek
Cains Coulee
Valley View Loop
Road 240
Road 244
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Road 250
Road 255
Road 261
Road 238
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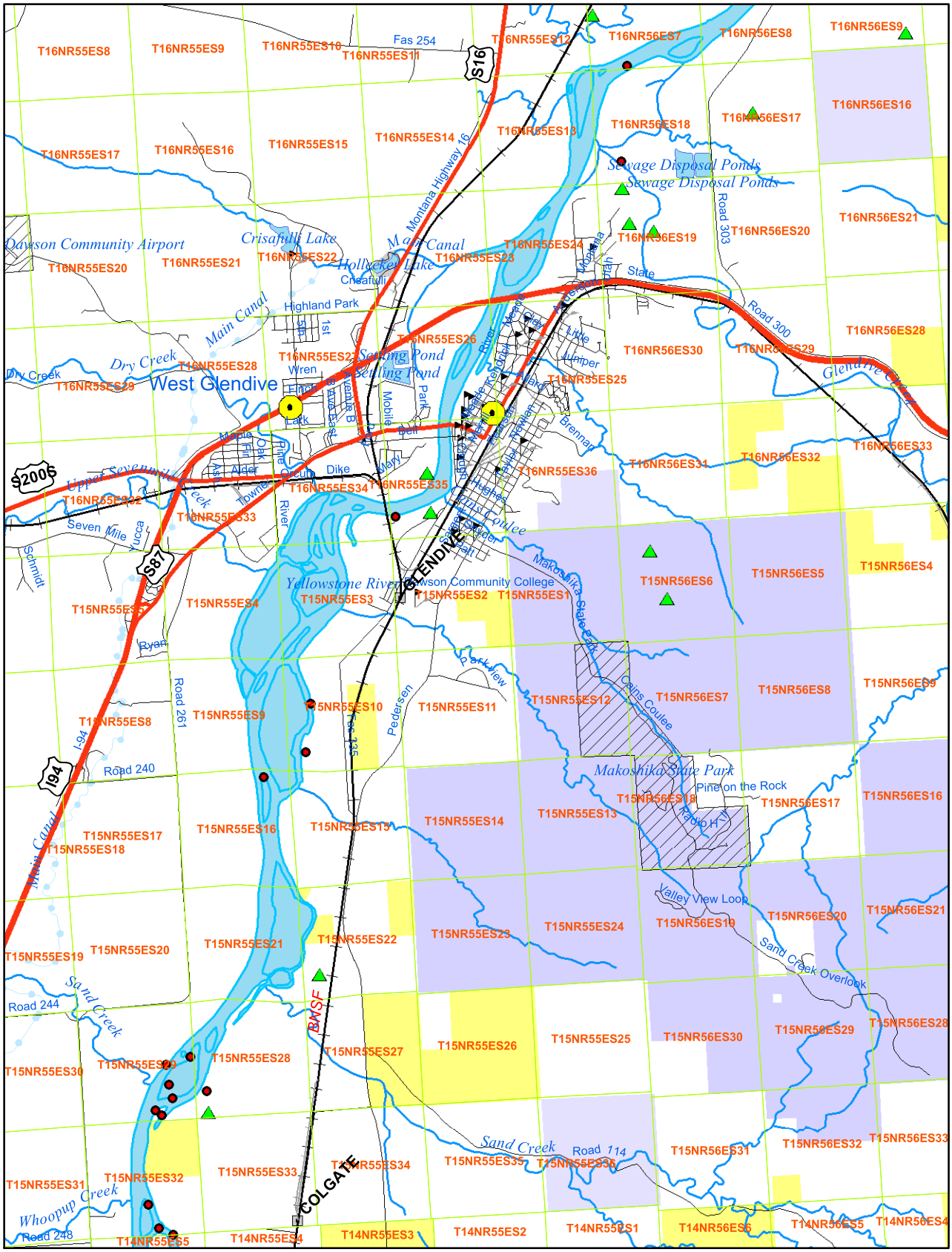
I-94
S87
BNSF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Sewage Disposal Ponds
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High
State
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1st
Main Canal
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Wren
Lane
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Mobile
Bell
Lake
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Oak
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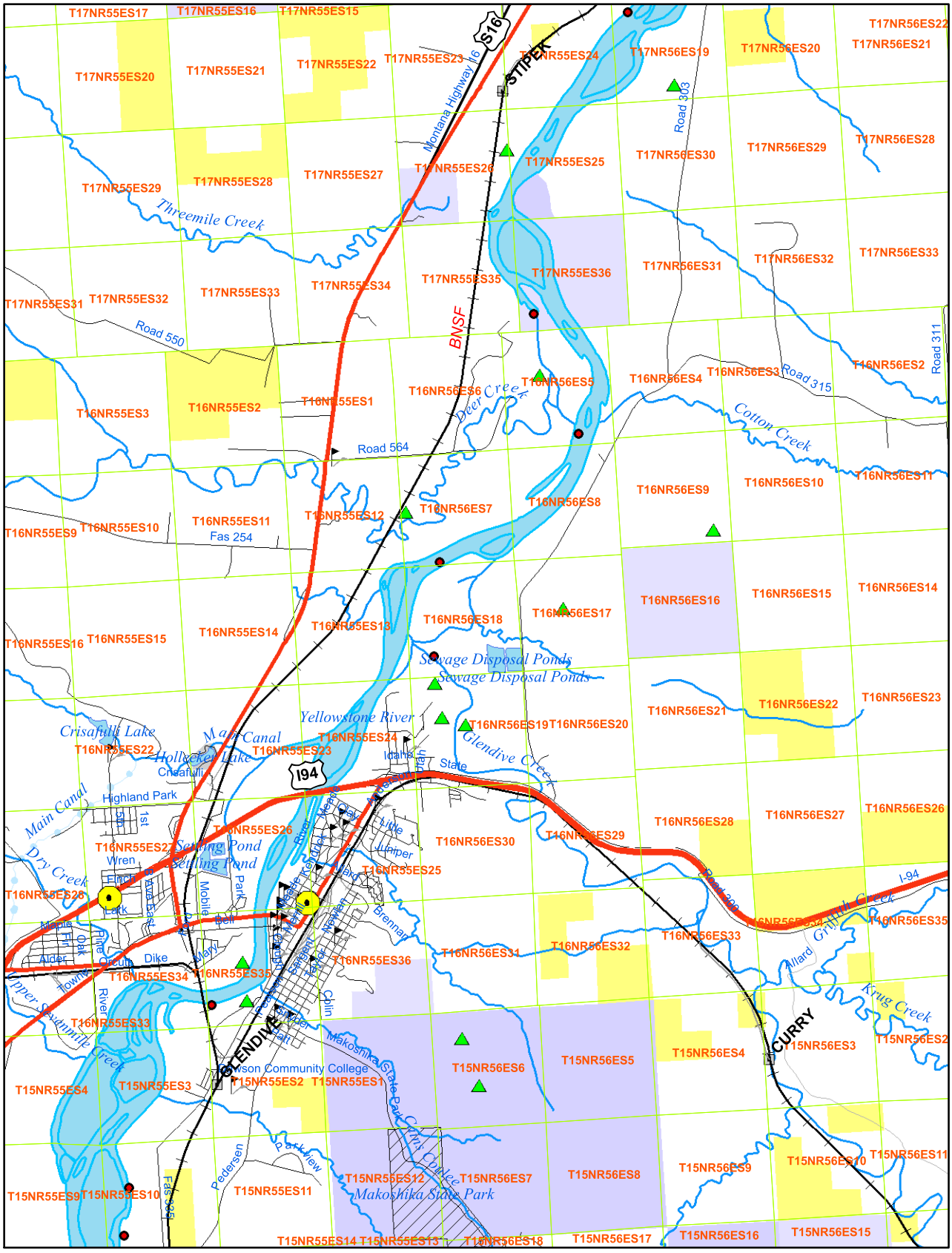
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Road 564
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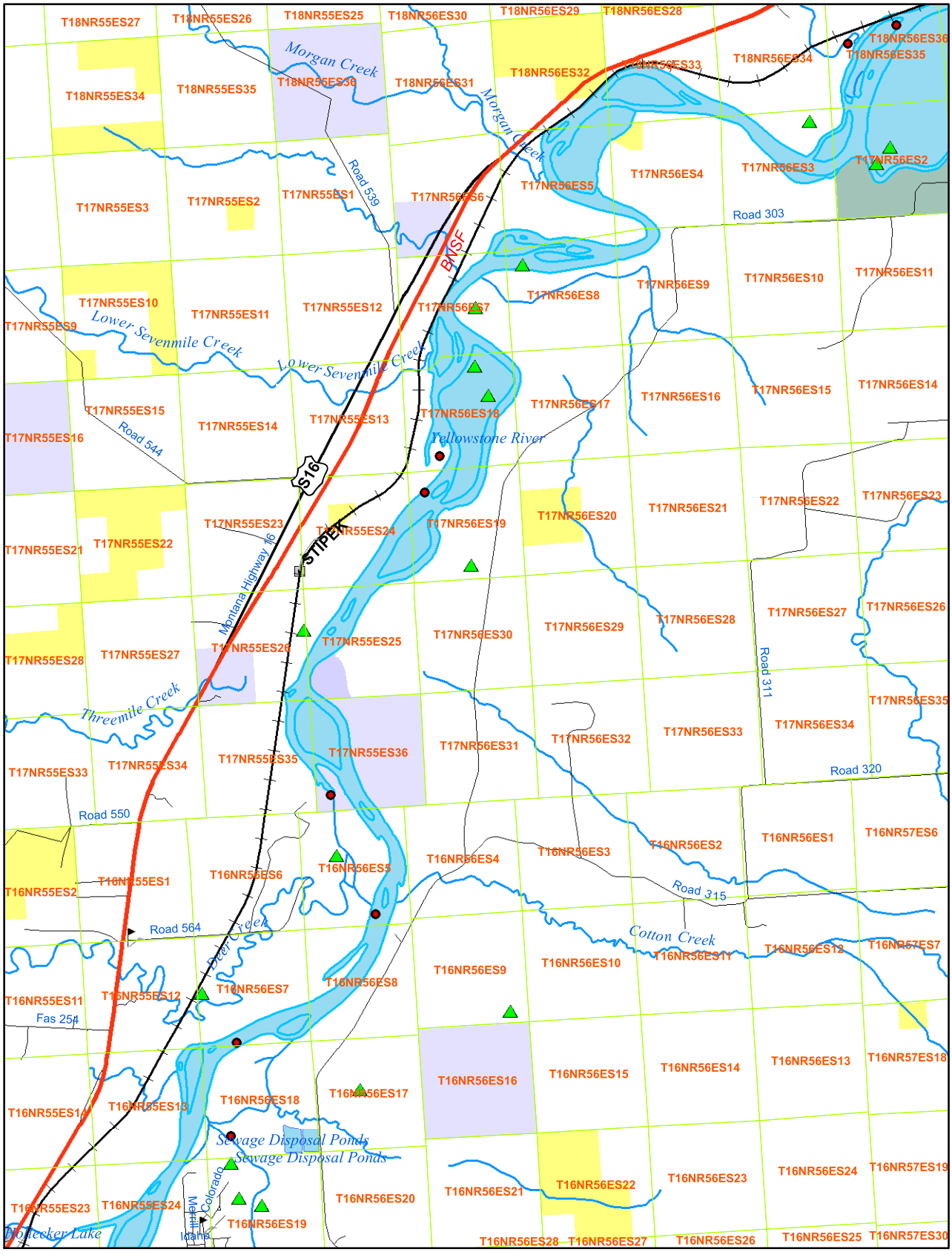
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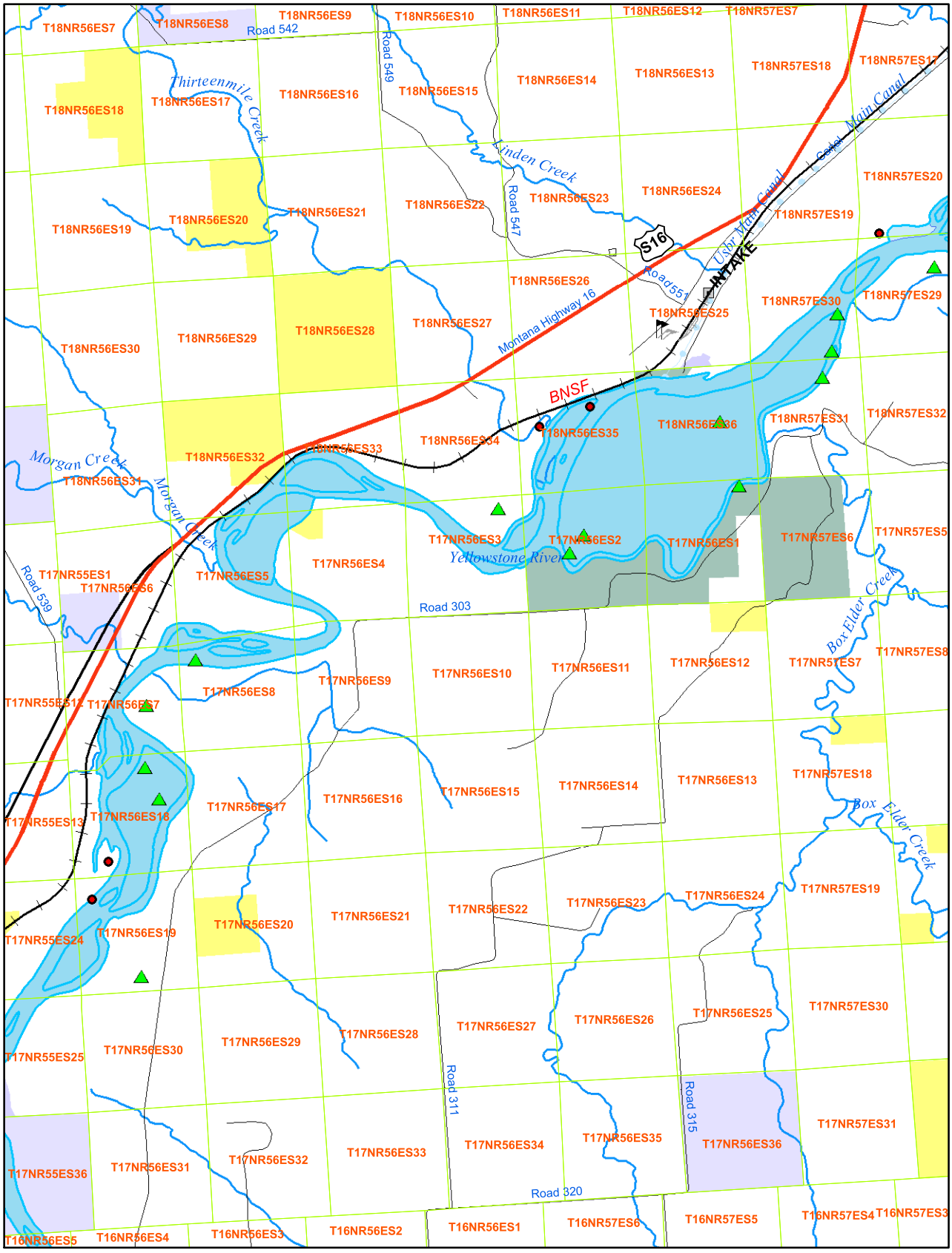
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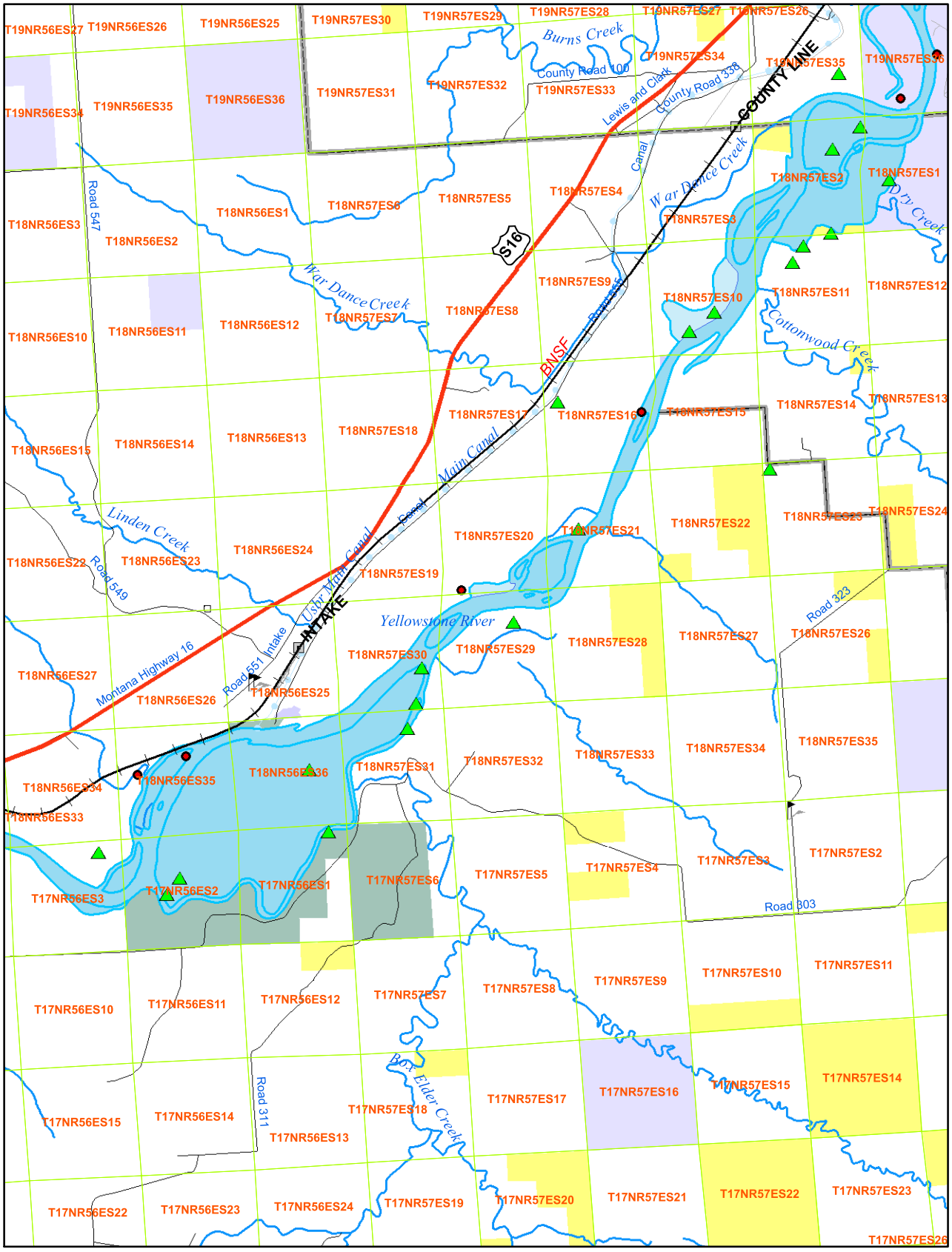
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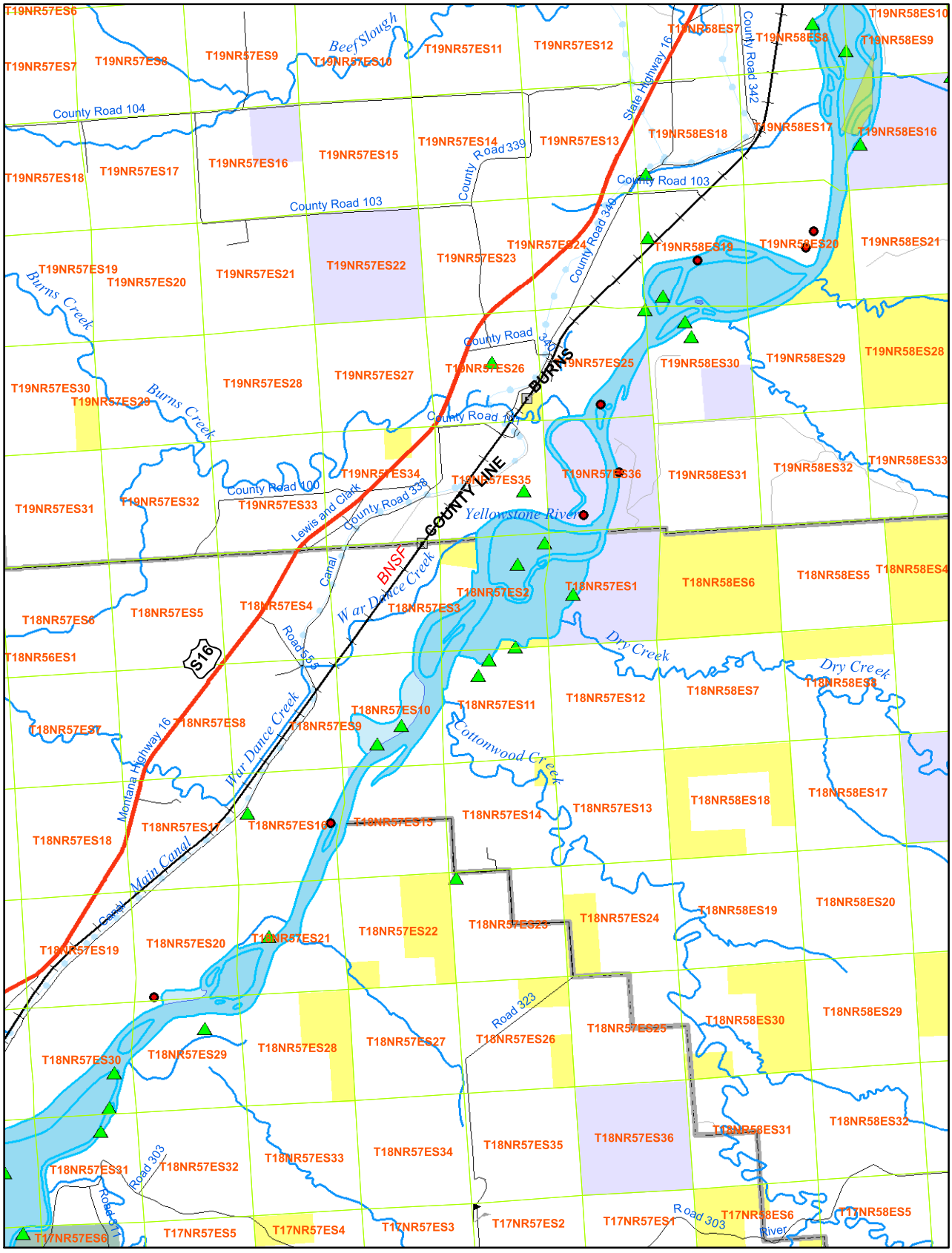
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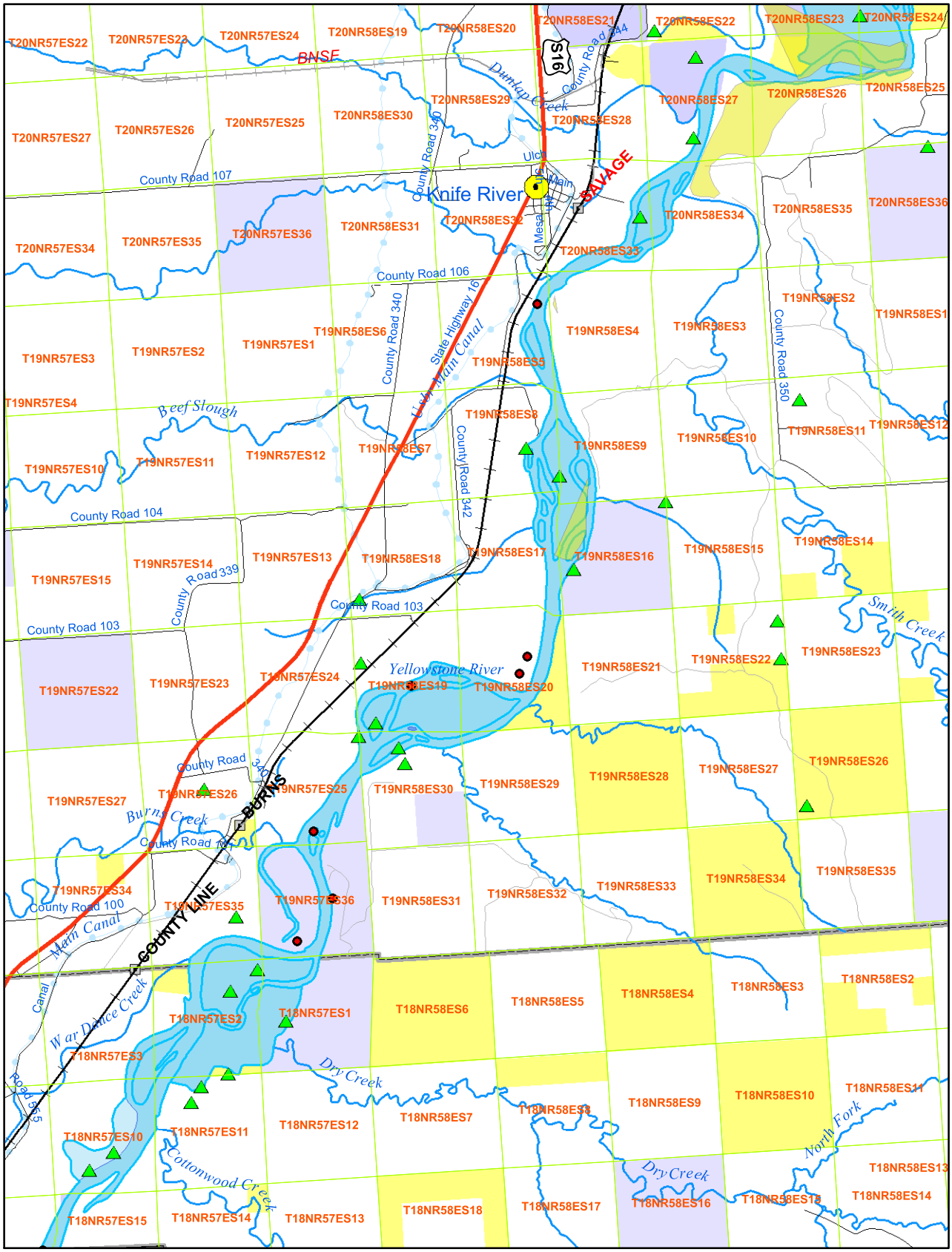
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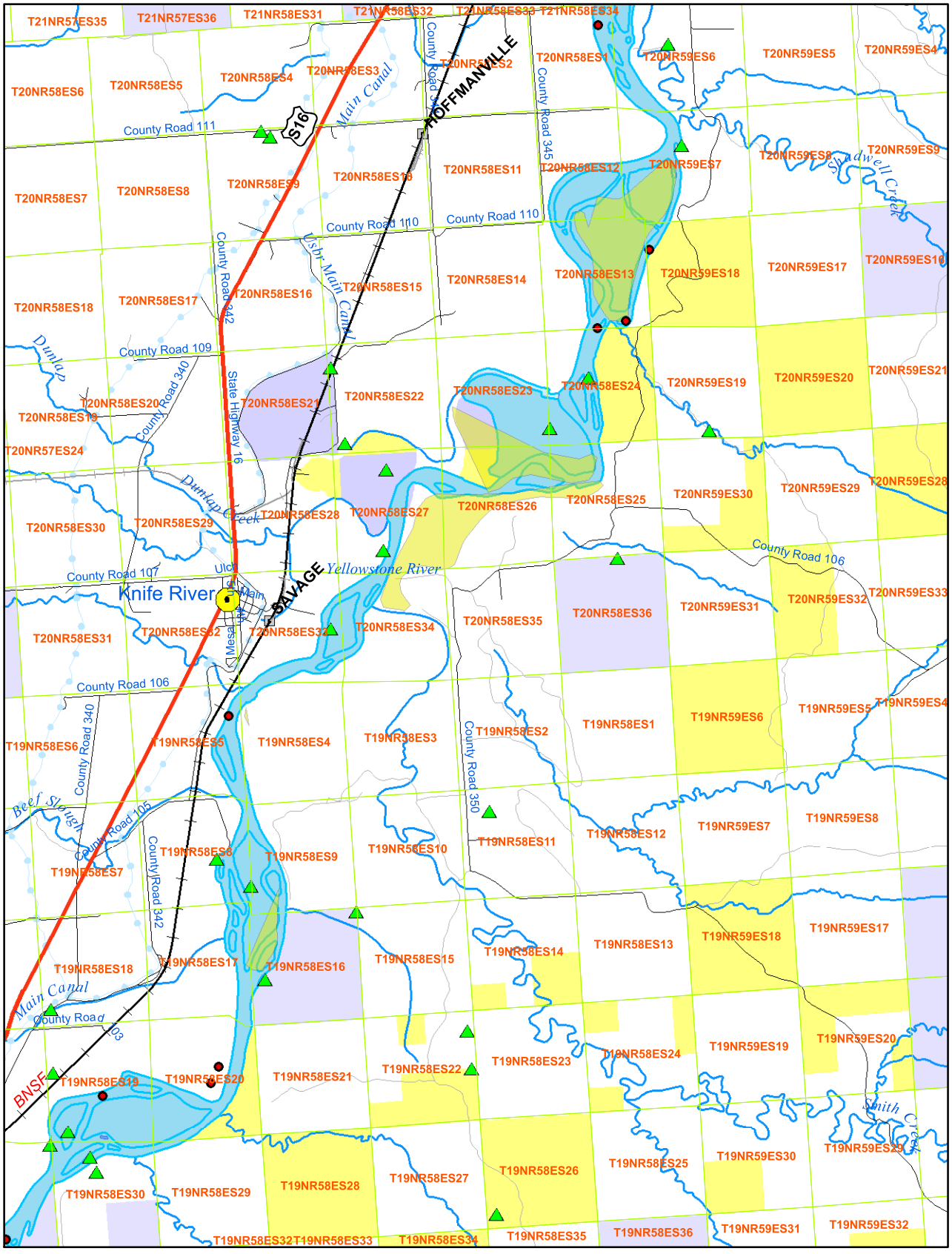
BURNS
S16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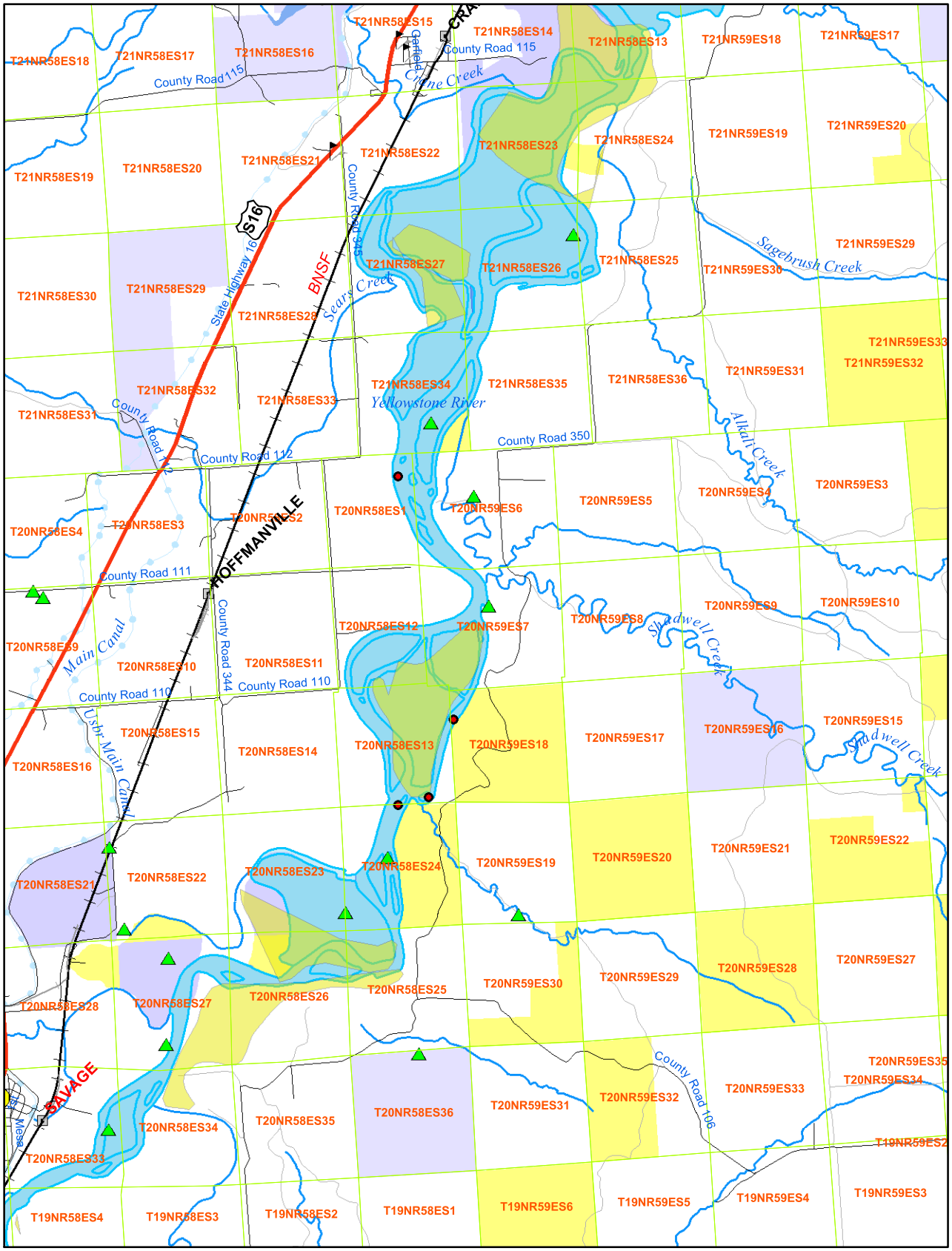
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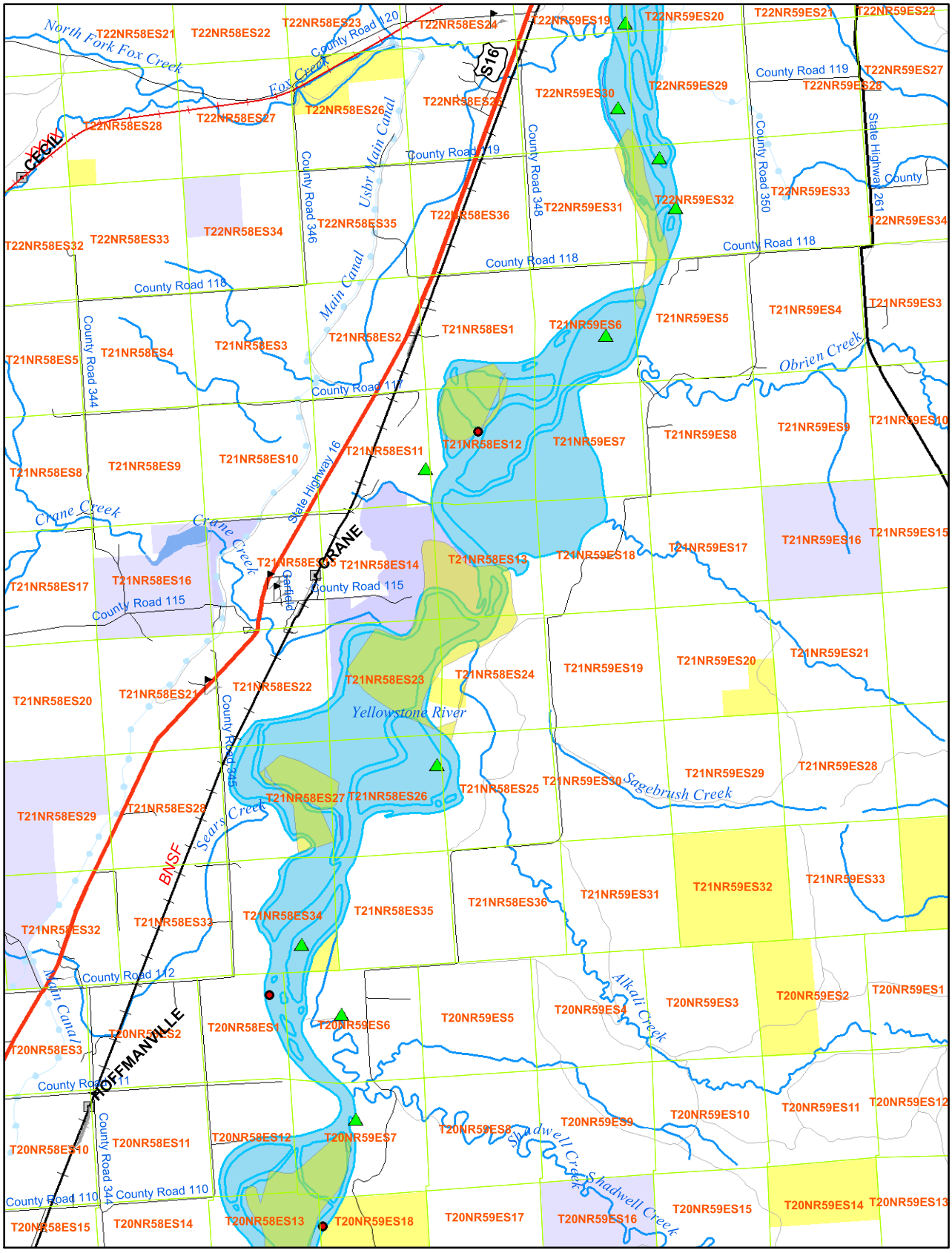
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Usbr Main Canal
County Road 348
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County Road 118
County Road 344
Obrien Creek
State Highway 16
Crane Creek
CRANE
Garfield
County Road 115
Yellowstone River
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Sagebrush Creek
Sears Creek
BNSF
Alkali Creek
HOFFMANVILLE
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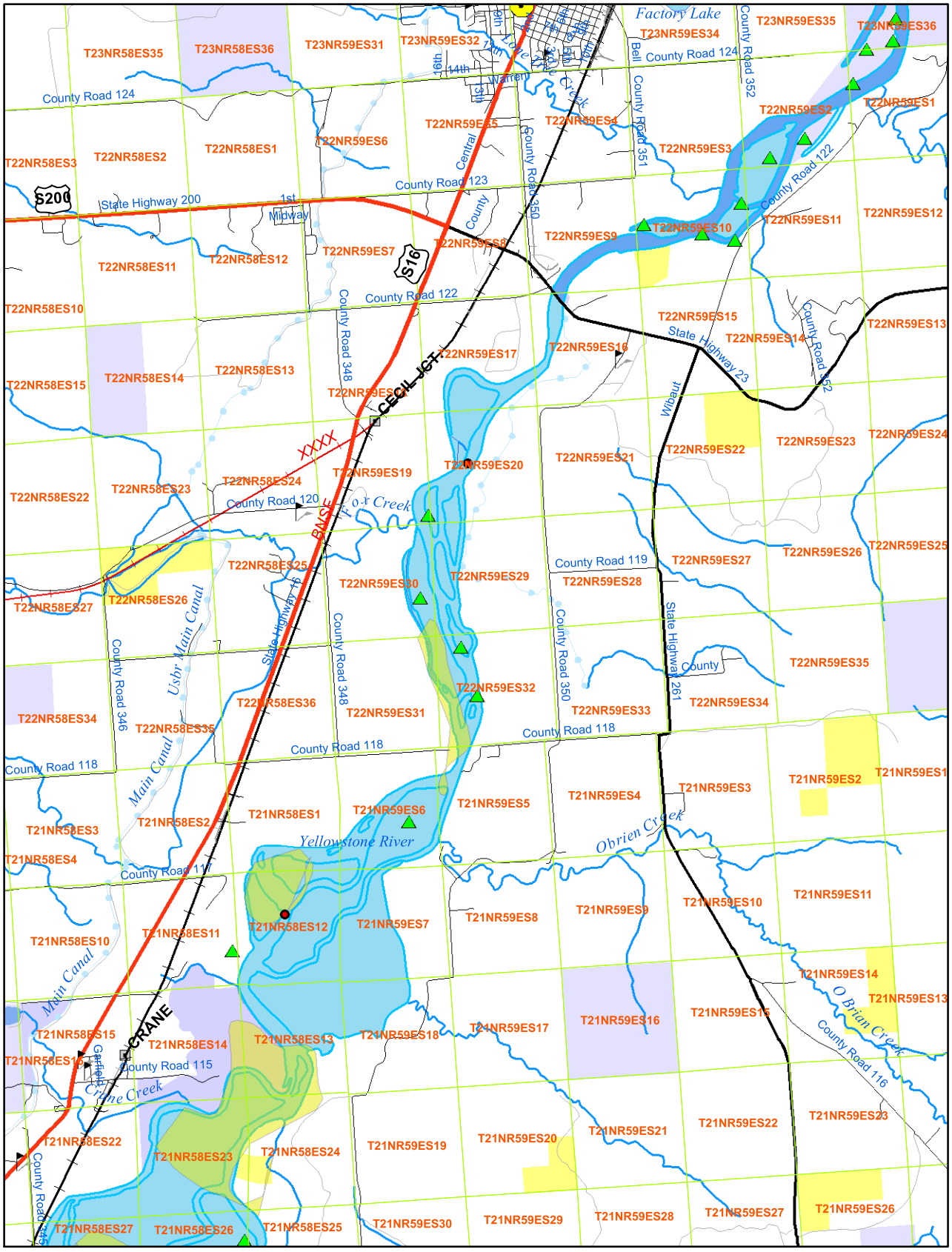
County Road 111
Shadwell Creek
County Road 110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Bell
Midway
Warren
Central
Wibaux
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Main Canal
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County Road 123
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County Road 120
County Road 119
County Road 118
County Road 117
County Road 115
County Road 116
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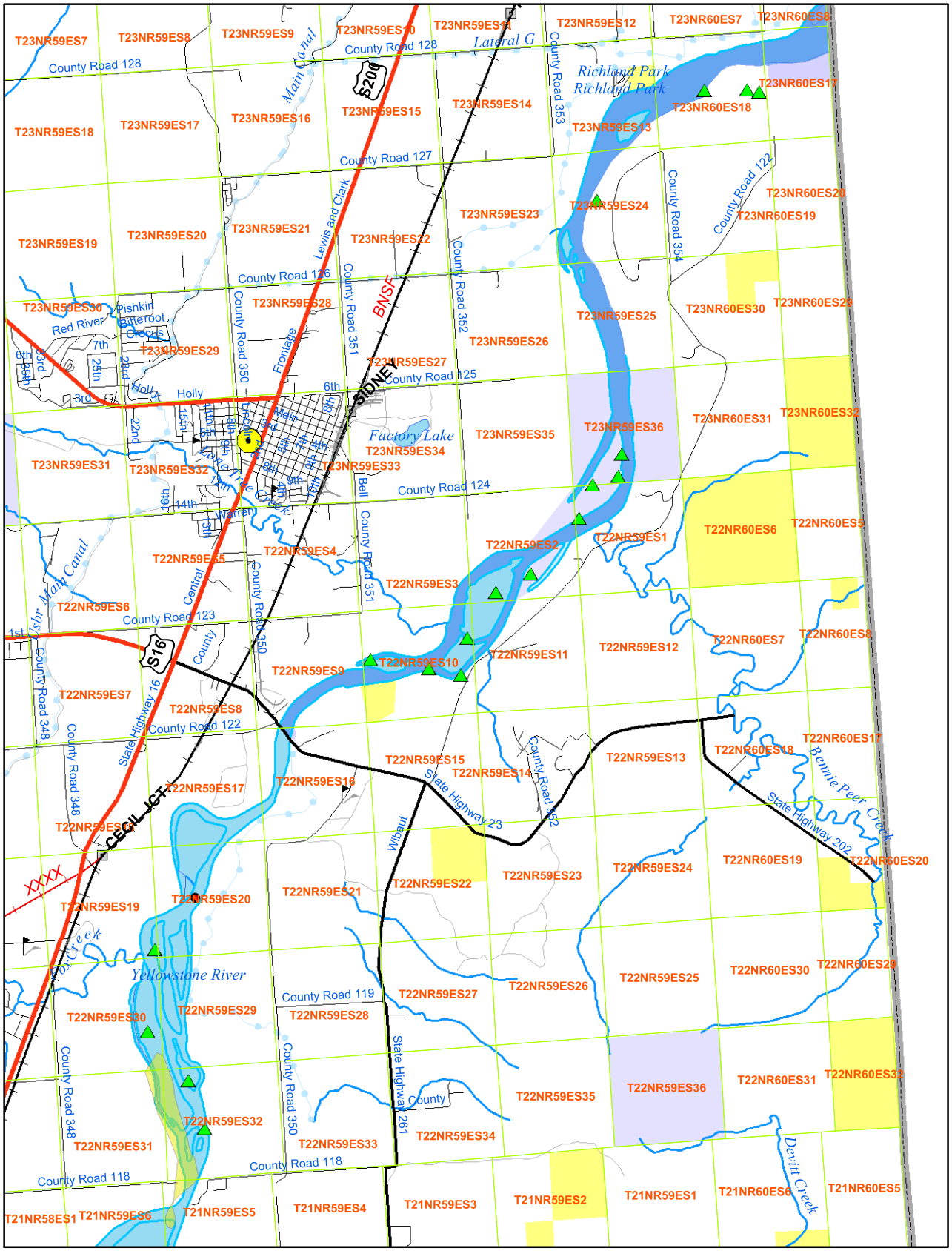
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Bitteroot
Crocus
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Frontage
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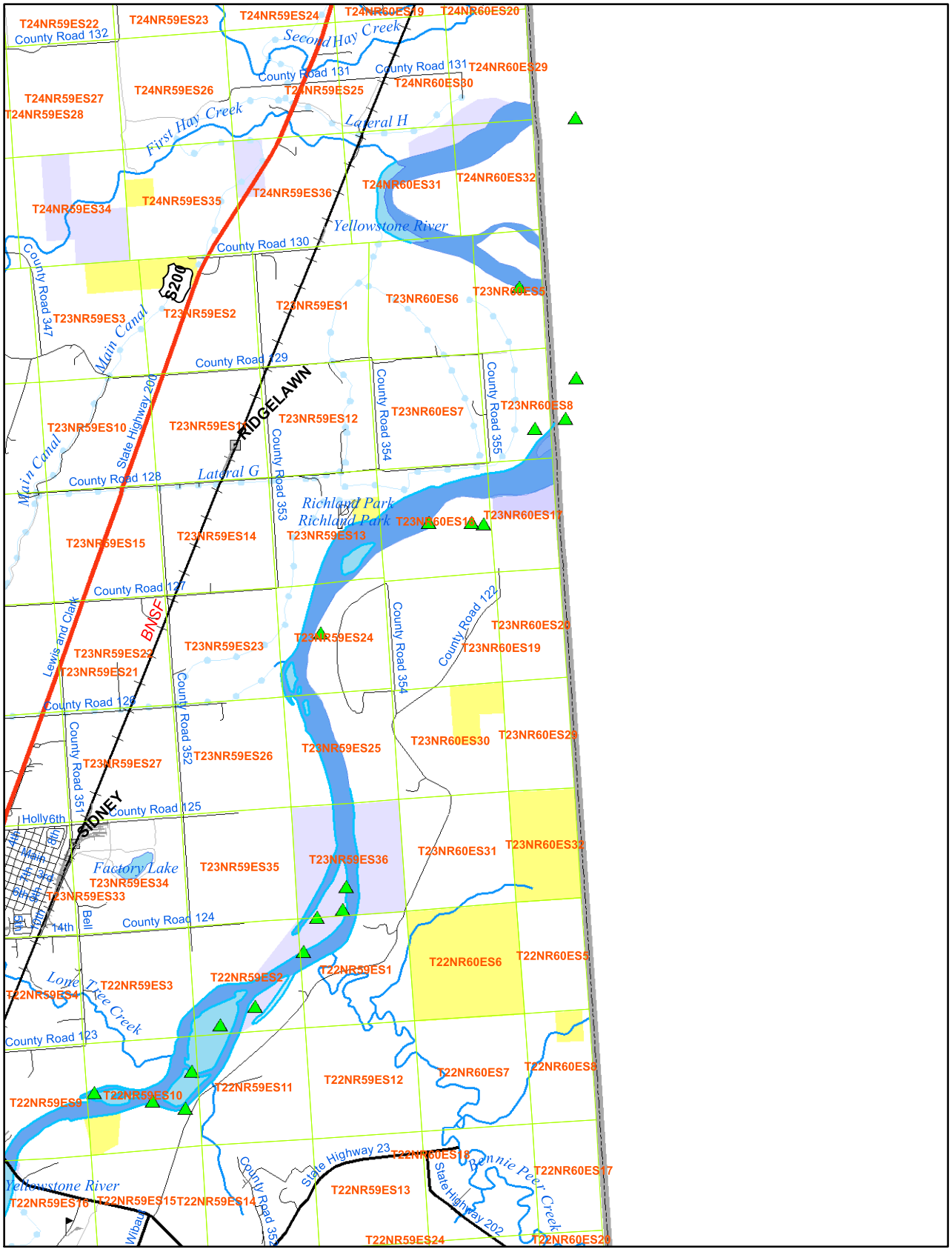
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County Road 122
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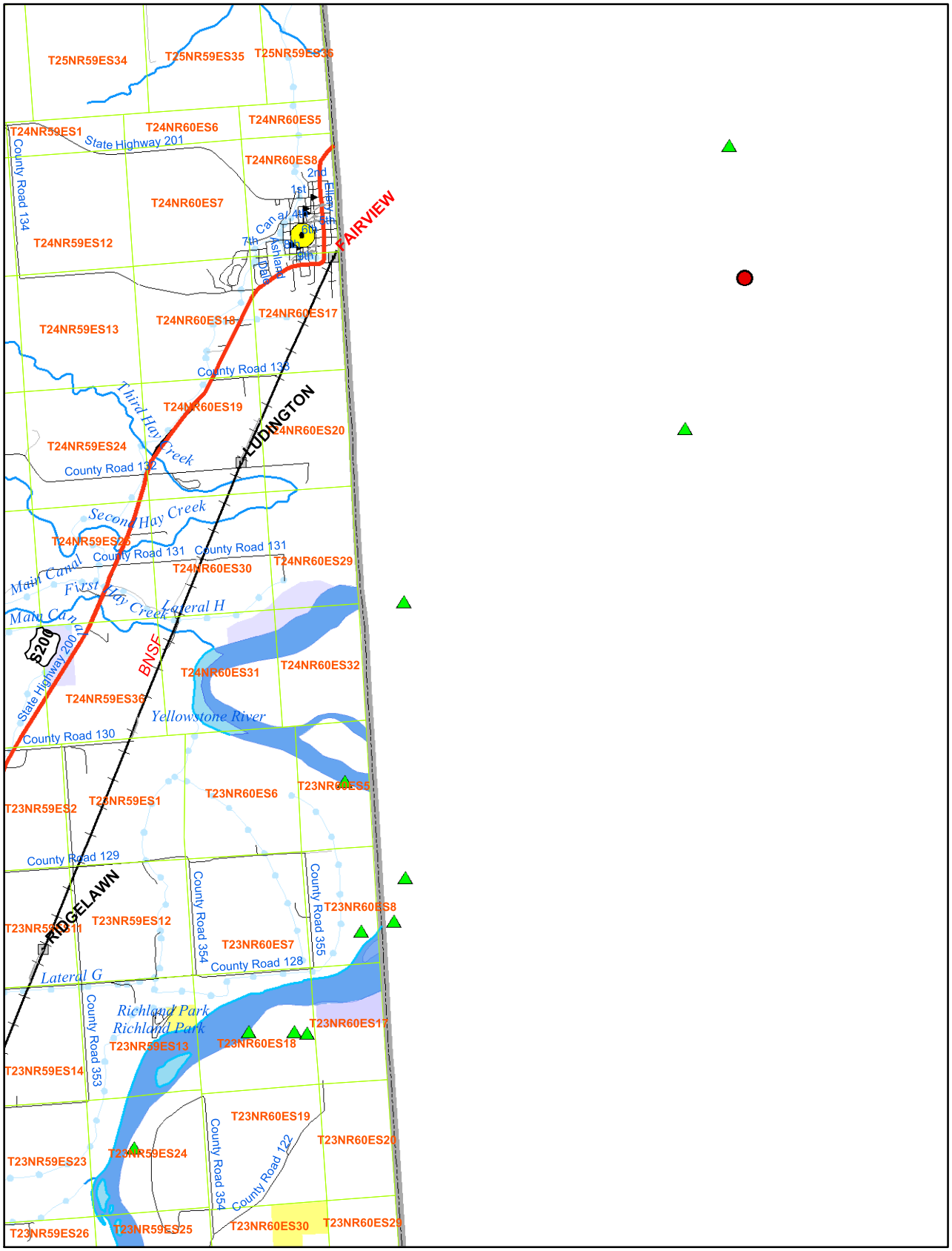
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1st
Ellery St
T24NR60ES7
Can al
4th
5th
7th
Ashland St
Dale St
FAIRVIEW
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T24NR59ES13
T24NR60ES18
T24NR60ES17
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LUDINGTON
T24NR60ES20
T24NR59ES24
County Road 132
Second Hay Creek
T24NR59ES25
County Road 131
County Road 131
T24NR60ES30
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Main Canal
First Hay Creek
Lateral H
Main Can
S209
State Highway 200 N
BNSF
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County Road 130
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County Road 129
RIDGELAWN
County Road 354
County Road 355
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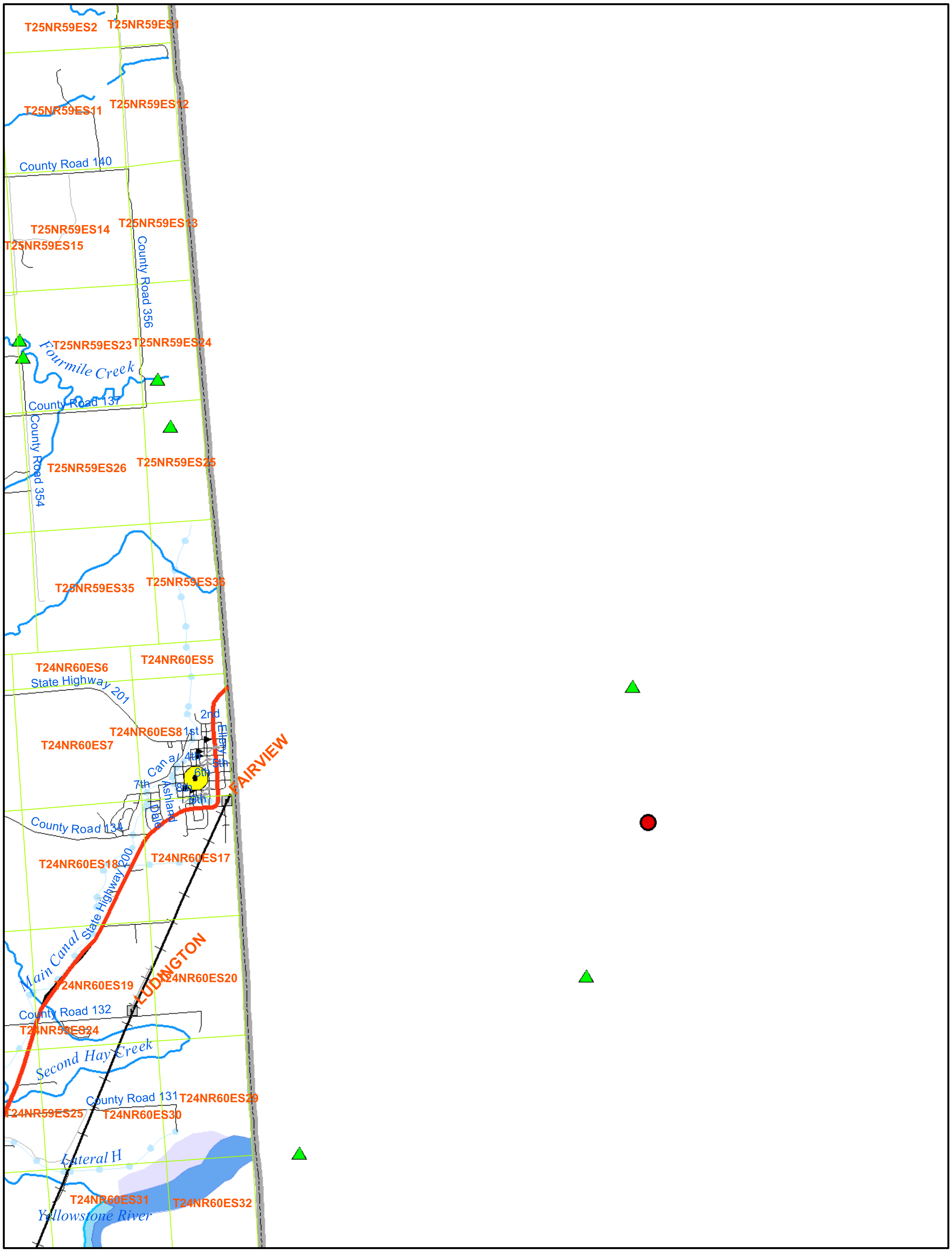
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County Road 354
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Canal
FAIRVIEW
7th
Ashland
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LUDINGTON
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County Road 132
Second Hay Creek
County Road 131
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Yellowstone River

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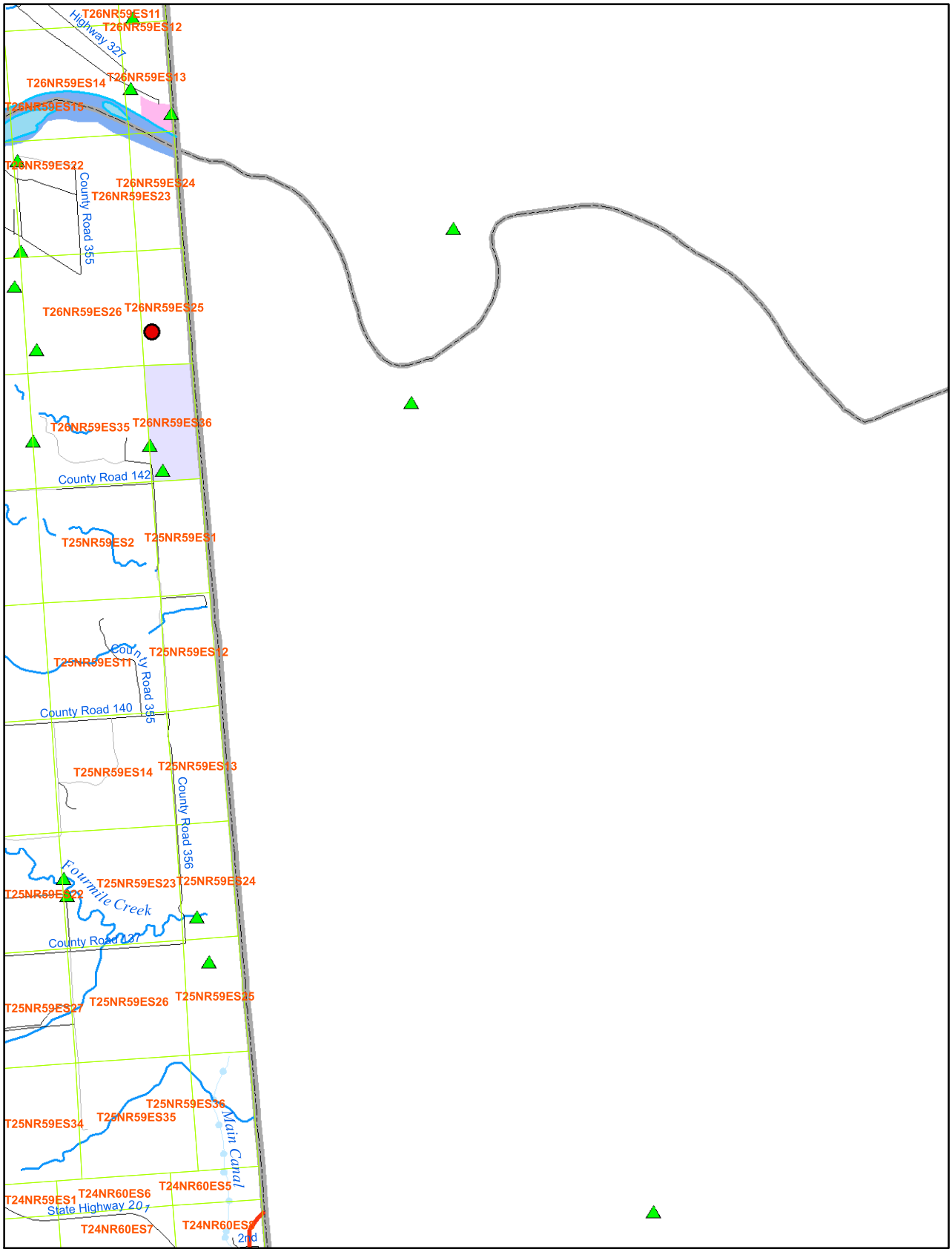
2000 & 2001 Helicopter
Noxious Weed
Inventory Projects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County Road 142
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T25NR59ES1
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County Road 355
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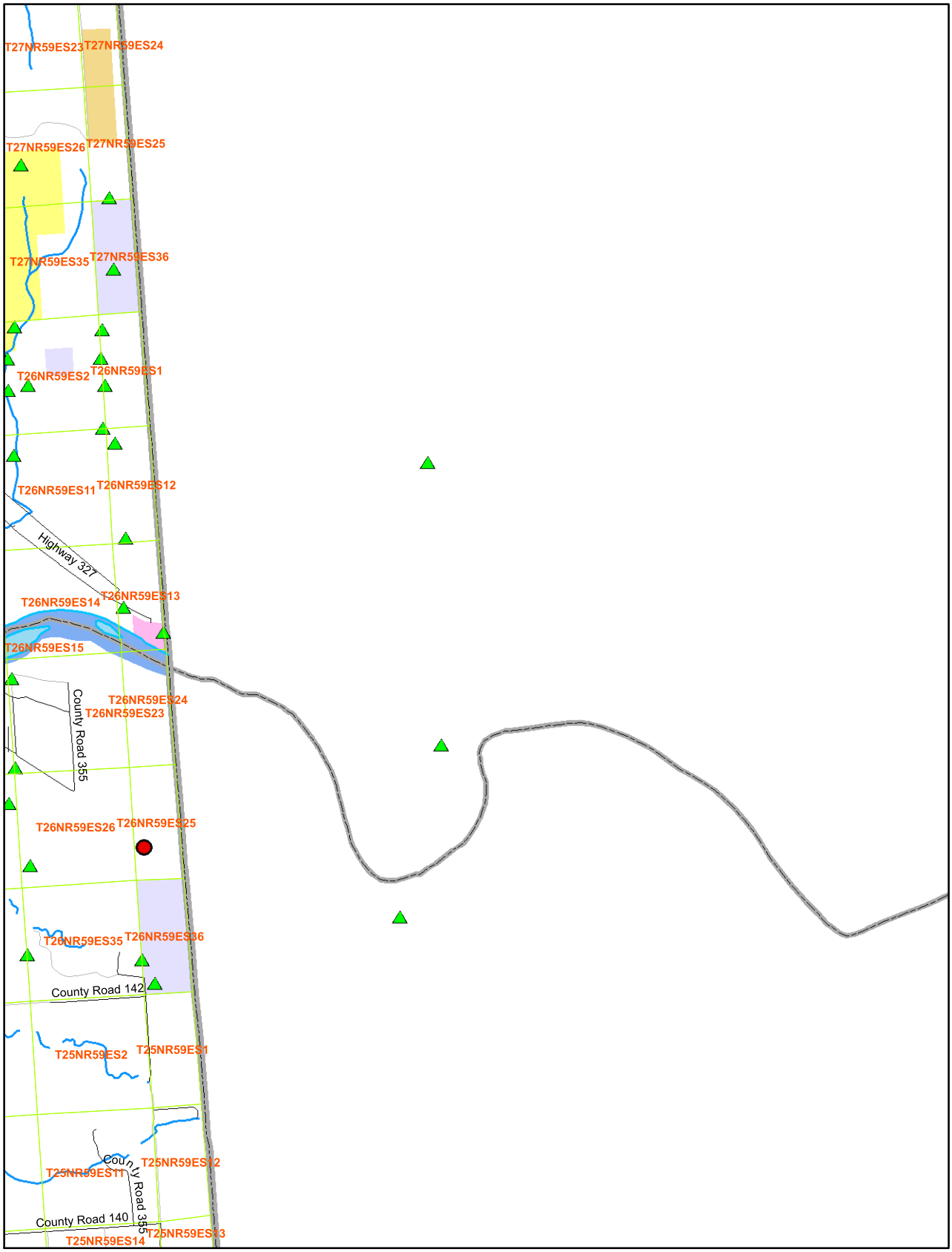
2nd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County Road 142
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County Road 355
County Road 140
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T25NR59ES13

Appendix F

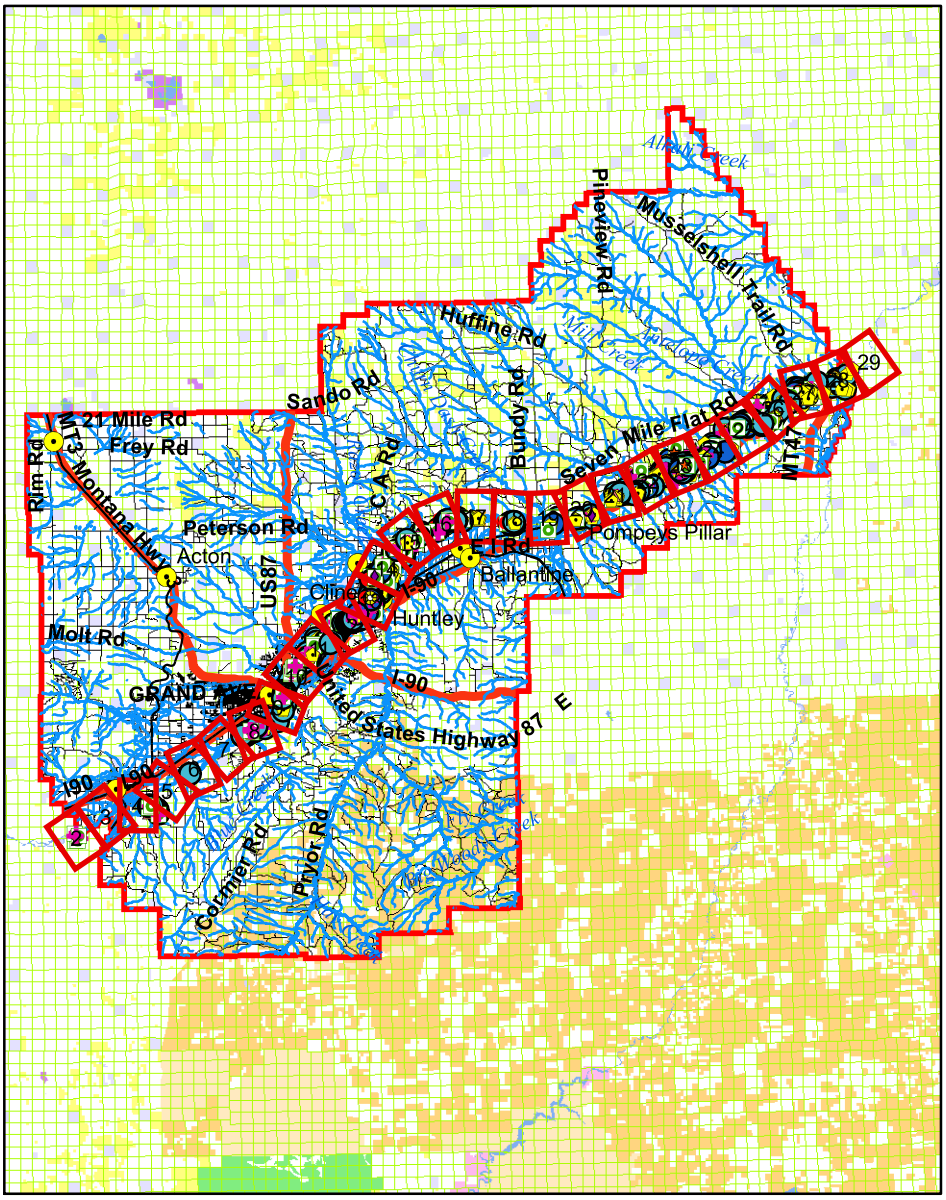
Yellowstone County, Montana

2002 – 2003

Yellowstone River Corridor

Noxious Weed Inventory Project Atlas Insert

Yellowstone County
2002 - 2003
Yellowstone River Corridor
Noxious Weed Inventory



Legend

Weed Points 1

SPECIES

- Blackhenbane
- Canada thistle
- Common burdock
- Common crupina
- Common mullein
- Field bindweed
- Houndstongue
- Leafy spurge
- Musk thistle
- Poison hemlock
- Russian knapweed
- Salt Cedar
- Scotch thistle
- Spotted knapweed
- Whitetop/Hoary cress
- Towns
- Railroad
- Streams
- Rivers
- Highways
- Lakes
- County Line
- Roads

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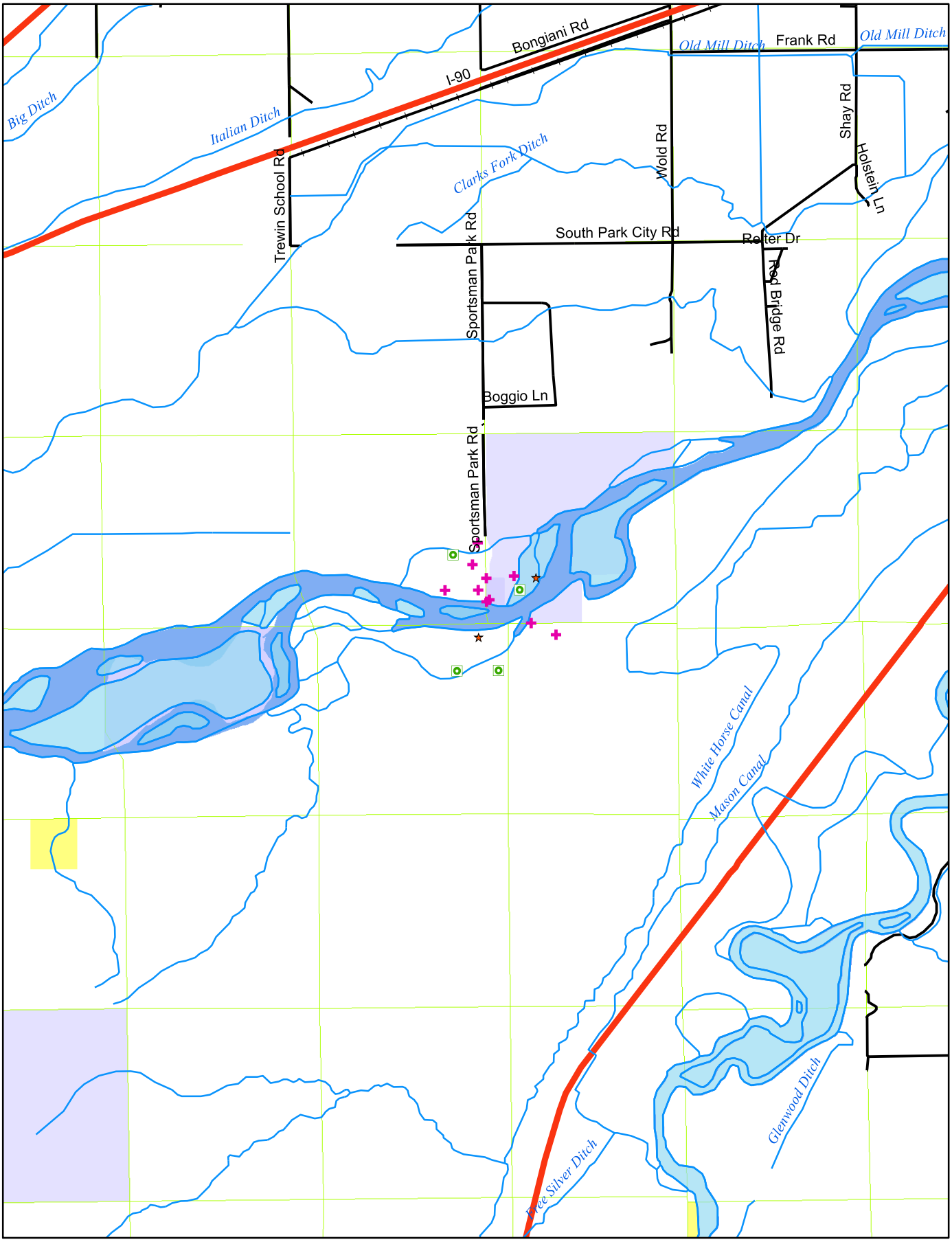

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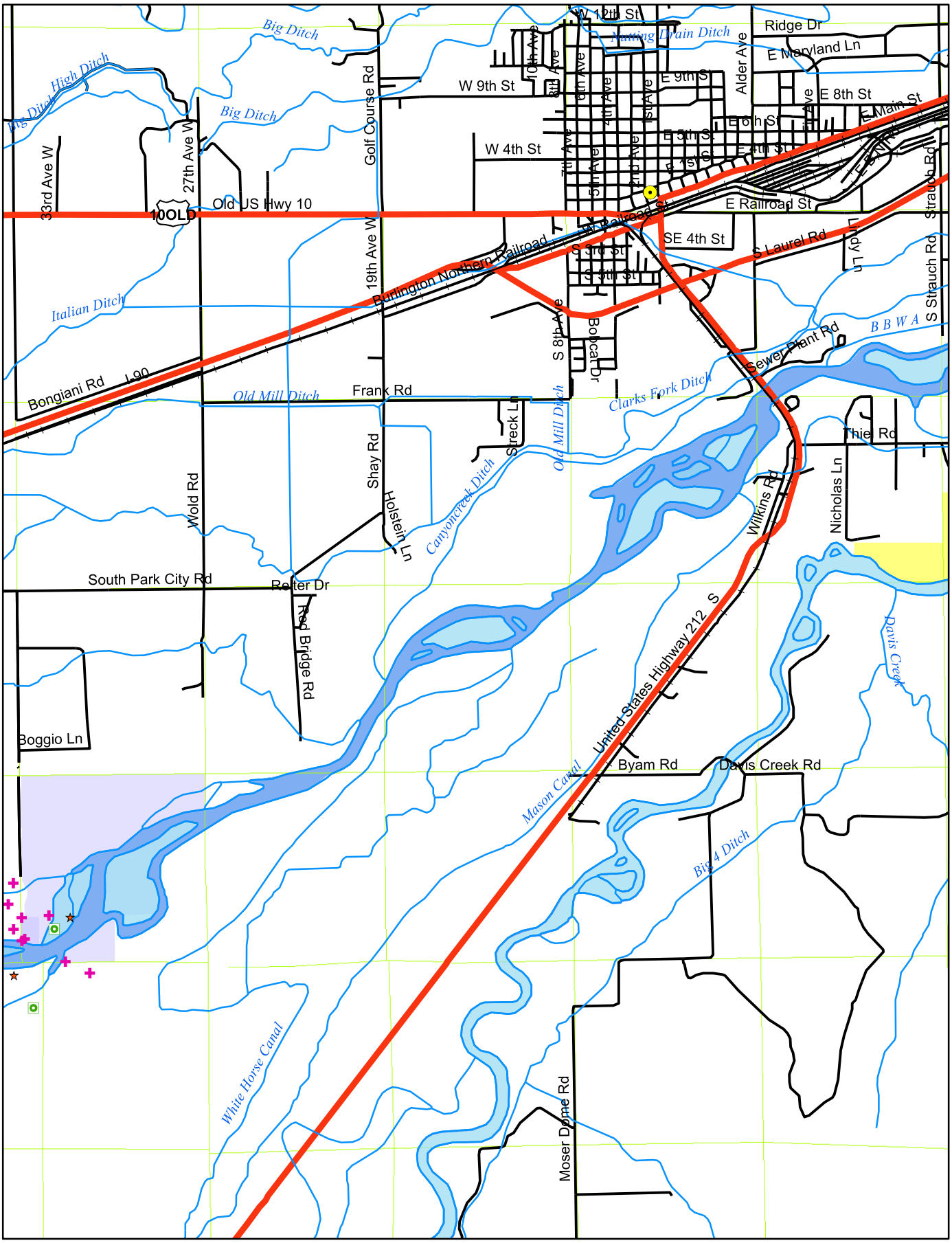
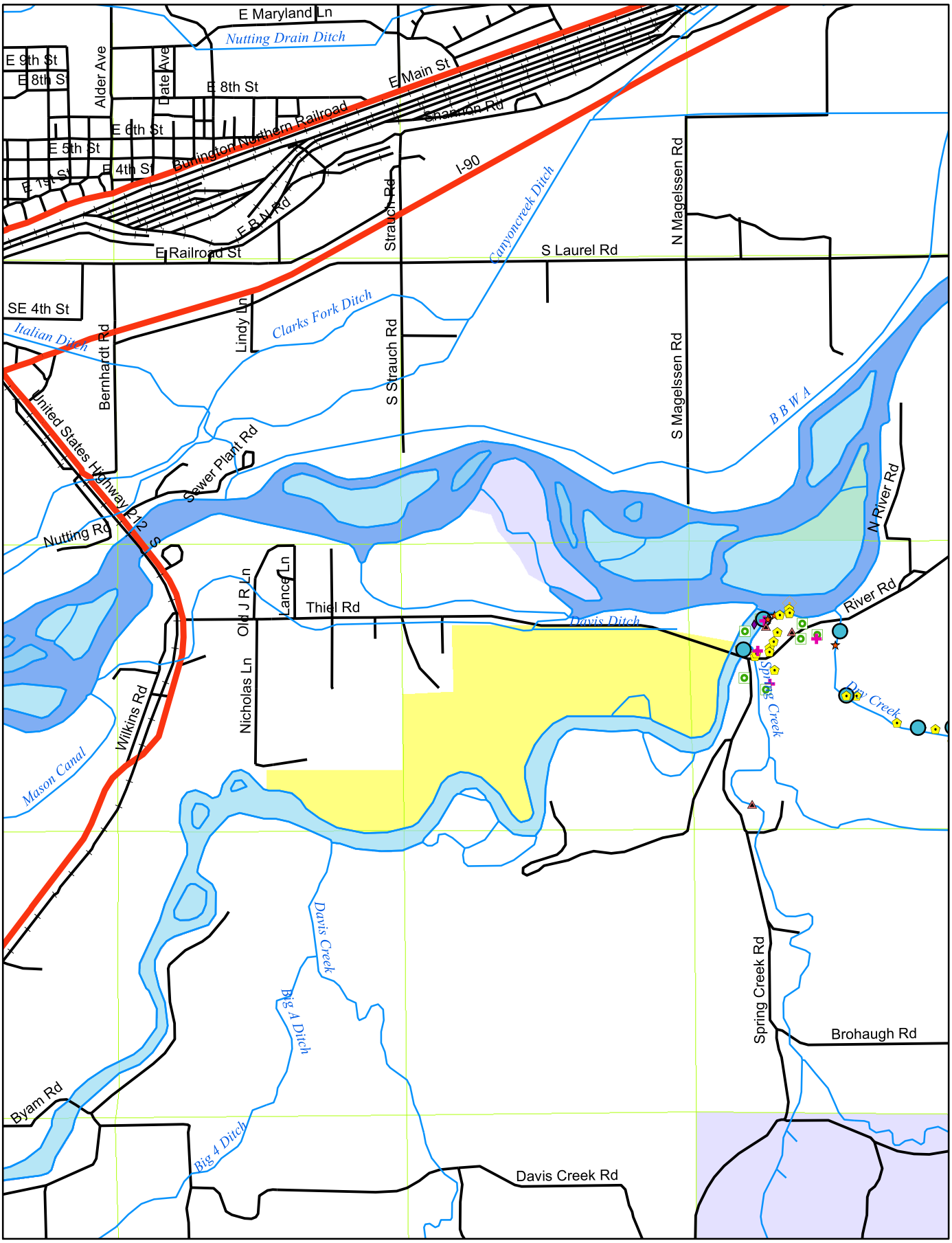
Yellowstone County
Yellowstone River Corridor
Inventory 2002-2003



Yellowstone County
Yellowstone River Corridor
Inventory 2002-2003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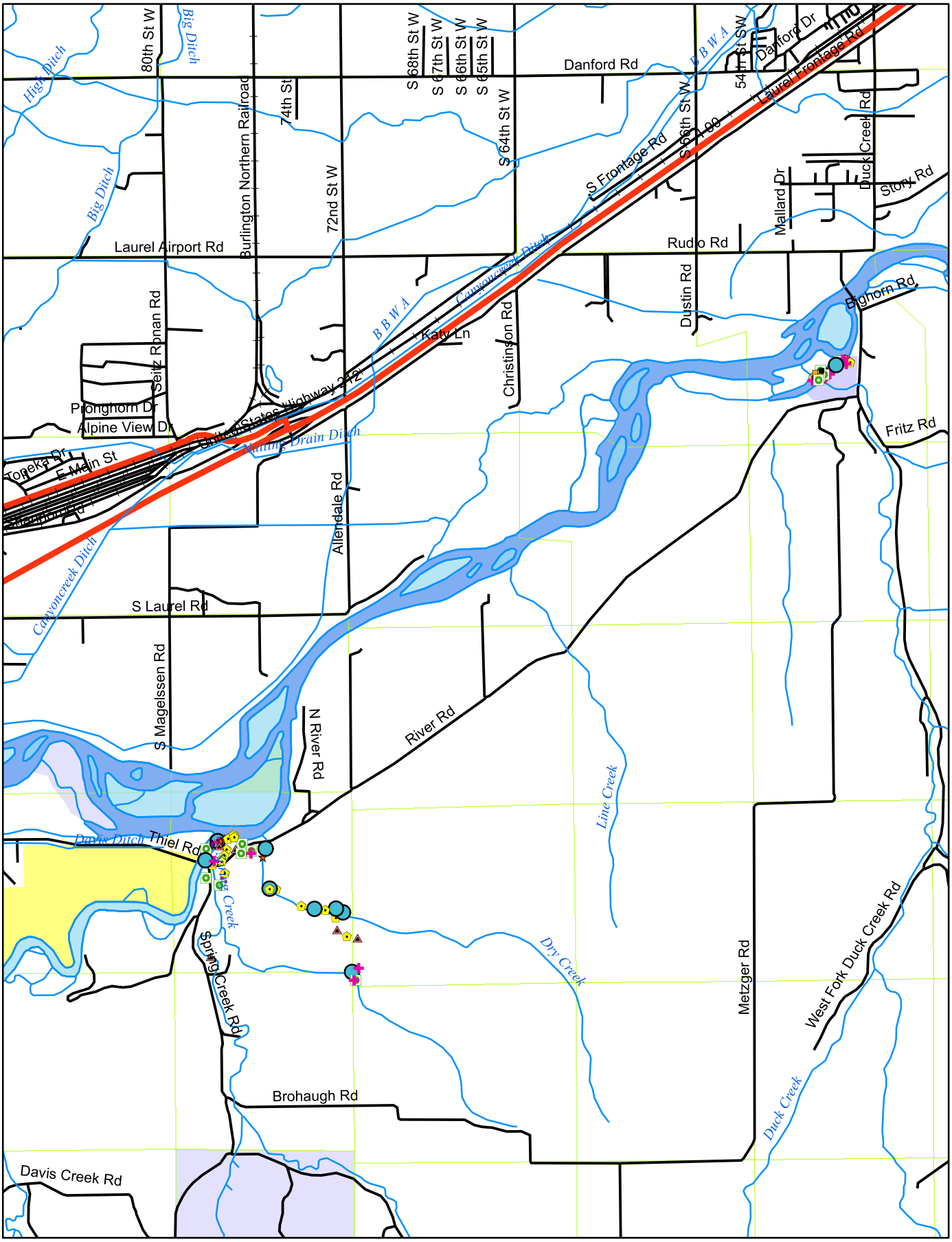
Nutting Drain Ditch
E 9th St
E 8th St
Alder Ave
Late Ave
E 8th St
E Main St
Shannon Rd
E 6th St
E 5th St
E 4th St
E 1st St
Burlington Northern Railroad
I-90
E B N Rd
E Railroad St
Strauch Rd
Canyoncreek Ditch
N Magelssen Rd
S Laurel Rd
SE 4th St
Italian Ditch
Bernhardt Rd
Lindy Ln
Clarks Fork Ditch
S Strauch Rd
S Magelssen Rd
B B W A
United States Highway 212 S
Sewer Plant Rd
N River Rd
Nutting Rd
Old J R Ln
Lance Ln
Thiel Rd
Davis Ditch
River Rd
Spring Creek
Big Creek
Nicholas Ln
Wilkins Rd
Mason Canal
Davis Creek
Big A Ditch
Spring Creek Rd
Brohaugh Rd
Byam Rd
Big 4 Ditch
Davis Creek Rd



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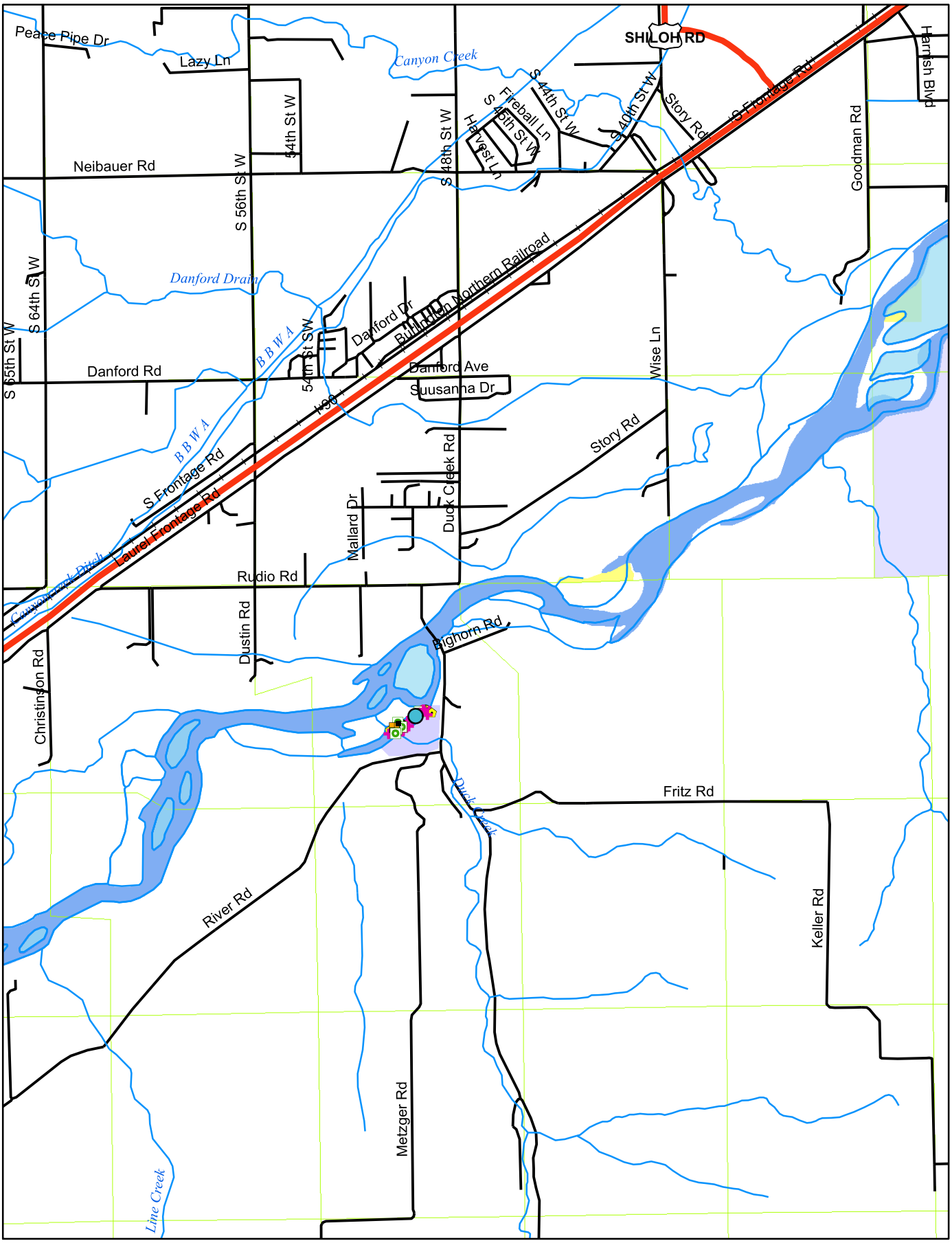
Yellowstone County
Yellowstone River Corridor
Inventory 2002-2003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Canyon Creek
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54th St W
S 48th St W
S Fireball Ln
S 45th St W
Harvest Ln
S 44th St W
S 40th St W
Story Rd
S Frontage Rd
Goodman Rd
Danford Drain
S 64th St W
S 65th St W
Danford Dr
Burlington Northern Railroad
B B W A
54th St W
Danford Rd
Danford Ave
Suusanna Dr
Wise Ln
I-90
S Frontage Rd
Laurel Frontage Rd
Mallard Dr
Duck Creek Rd
Story Rd
Canyon Creek Ditch
Rudio Rd
Dustin Rd
Bighorn Rd
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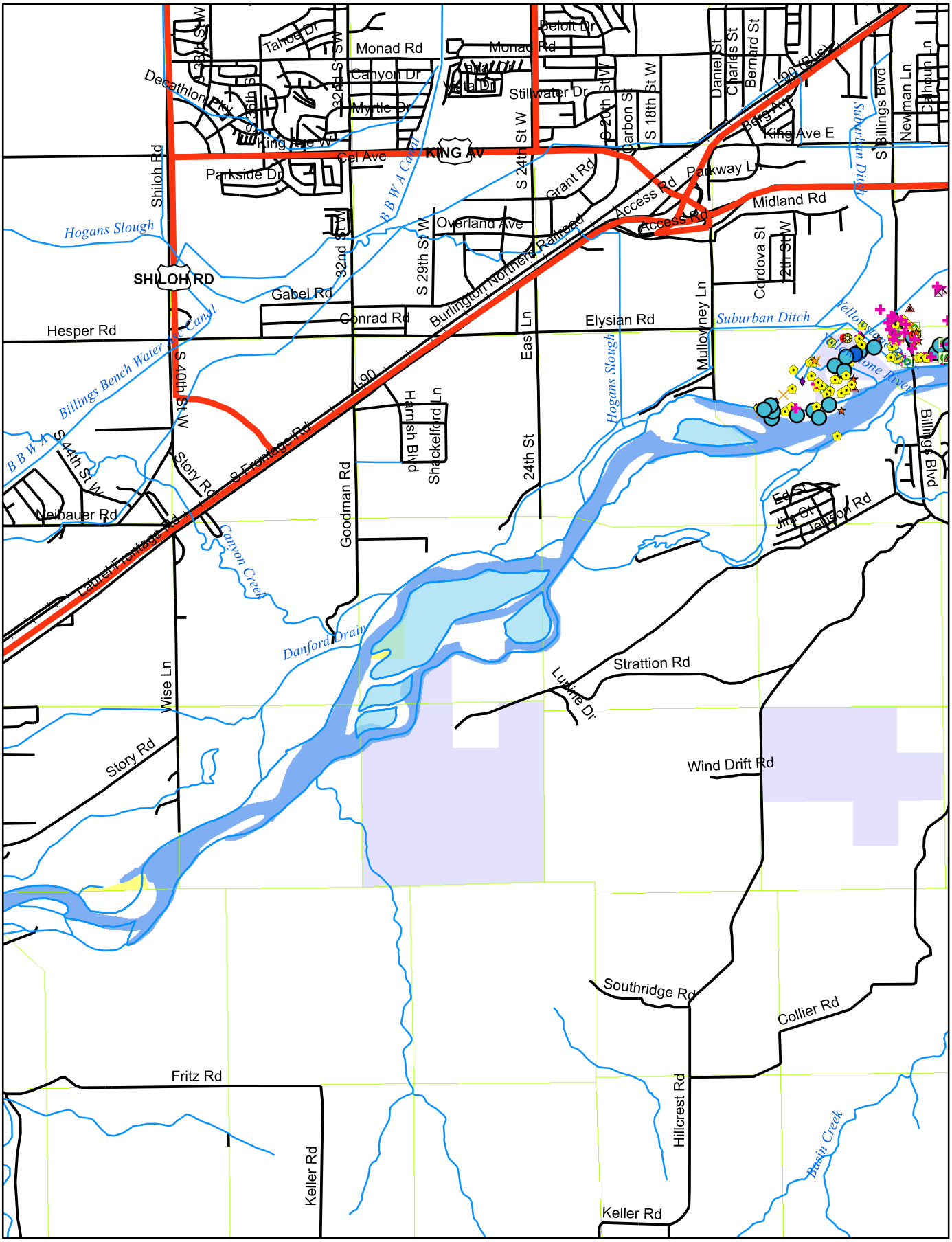
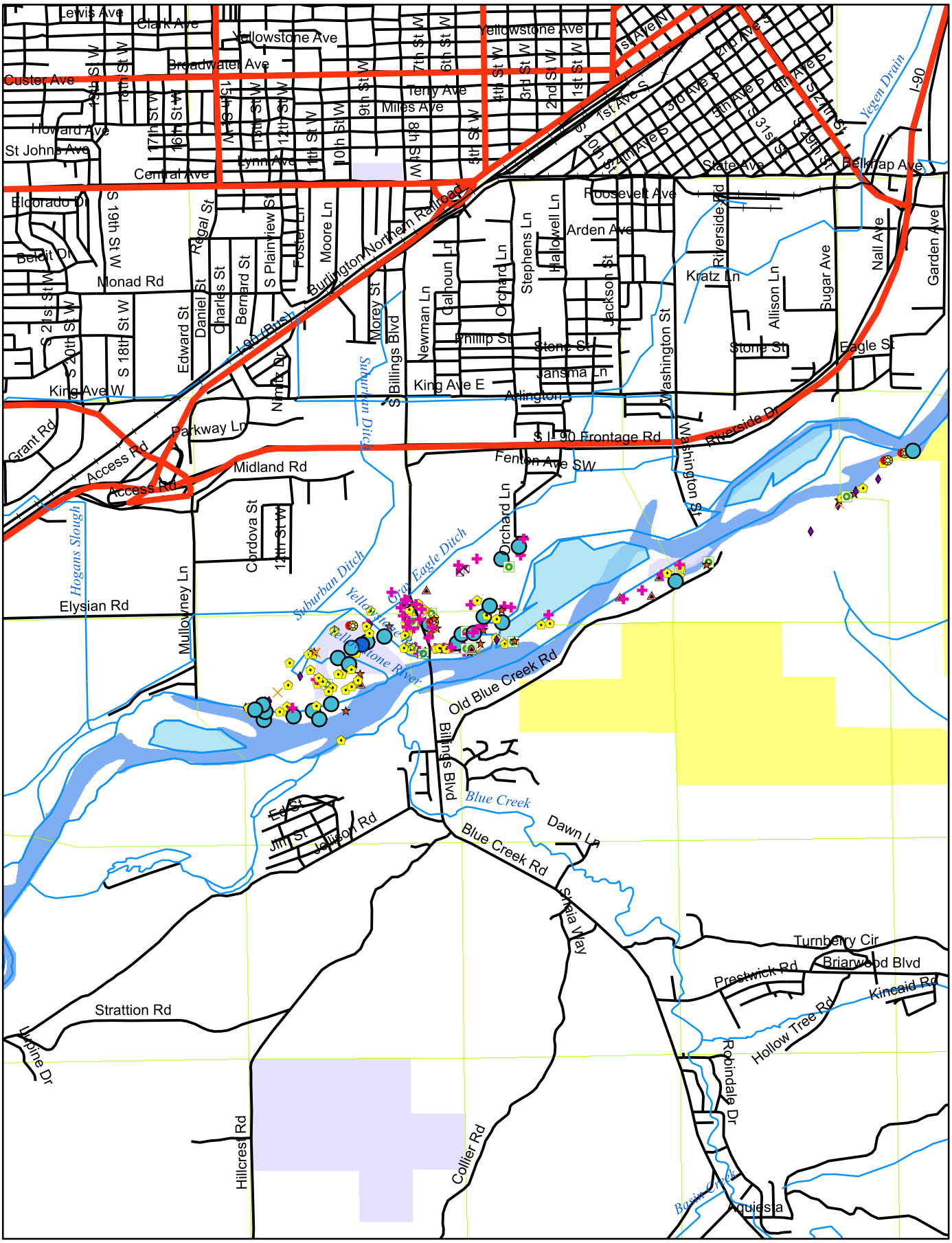
Duck Creek
Fritz Rd
River Rd
Keller Rd
Metzger Rd
Line Creek



Yellowstone County
Yellowstone River Corridor
Inventory 2002-2003

Hysham Enterprises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Beloit Dr
Monad Rd
King Ave W
King Ave E
Grant Rd
Access Rd
Parkway Ln
Midland Rd
Elysian Rd
Mullowney Ln
Hoguns Slough
Cordova St
Edward St
Daniel St
Charles St
Bernard St
Regal St
S Plainview St
Foster Ln
Moore Ln
Burlington Northern Railroad
Morey St
S Billings Blvd
Newman Ln
Dalhoun Ln
Orchard Ln
Stephens Ln
Hallowell Ln
Arden Ave
Roosevelt Ave
Jackson St
Riverside Rd
Kratz Ln
Allison Ln
Sugar Ave
Nall Ave
Garden Ave
Phillip St
Stone St
Eagle St
Jansma Ln
Arlington
Washington St
Riverside Dr
S Frontage Rd
Fenton Ave SW
Suburban Ditch
Yellowstone River
Old Blue Creek Rd
Billings Blvd
Blue Creek
Blue Creek Rd
Dawn Ln
Shilla Way
Turnberry Cir
Briarwood Blvd
Prestwick Rd
Kincaid Rd
Hollow Tree Rd
Robindale Dr
Strattion Rd
Hillcrest Rd
Collier Rd
Basin Creek
Aquissa
Yegen Drain
I-90
1st Ave S
2nd Ave S
3rd Ave S
4th Ave S
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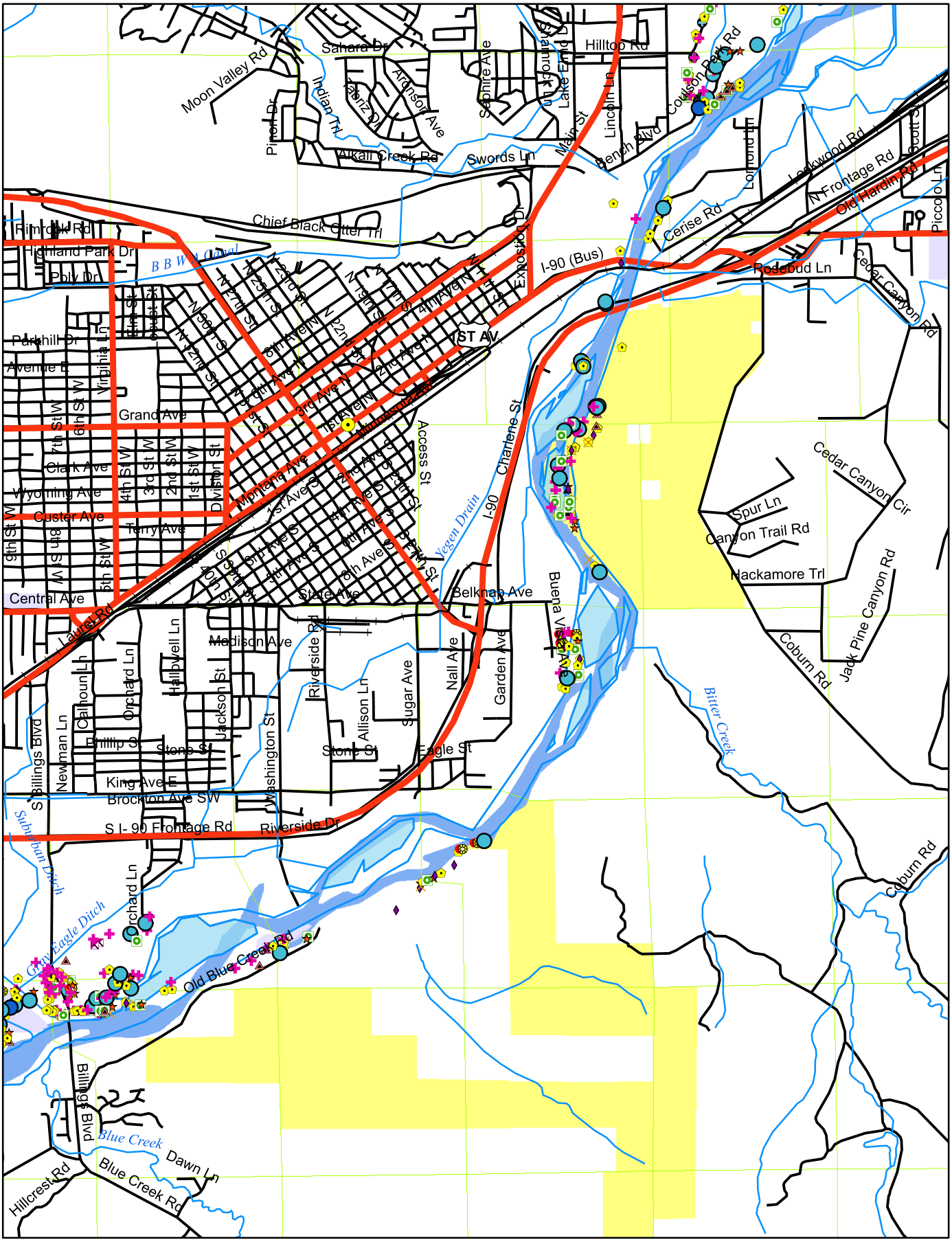
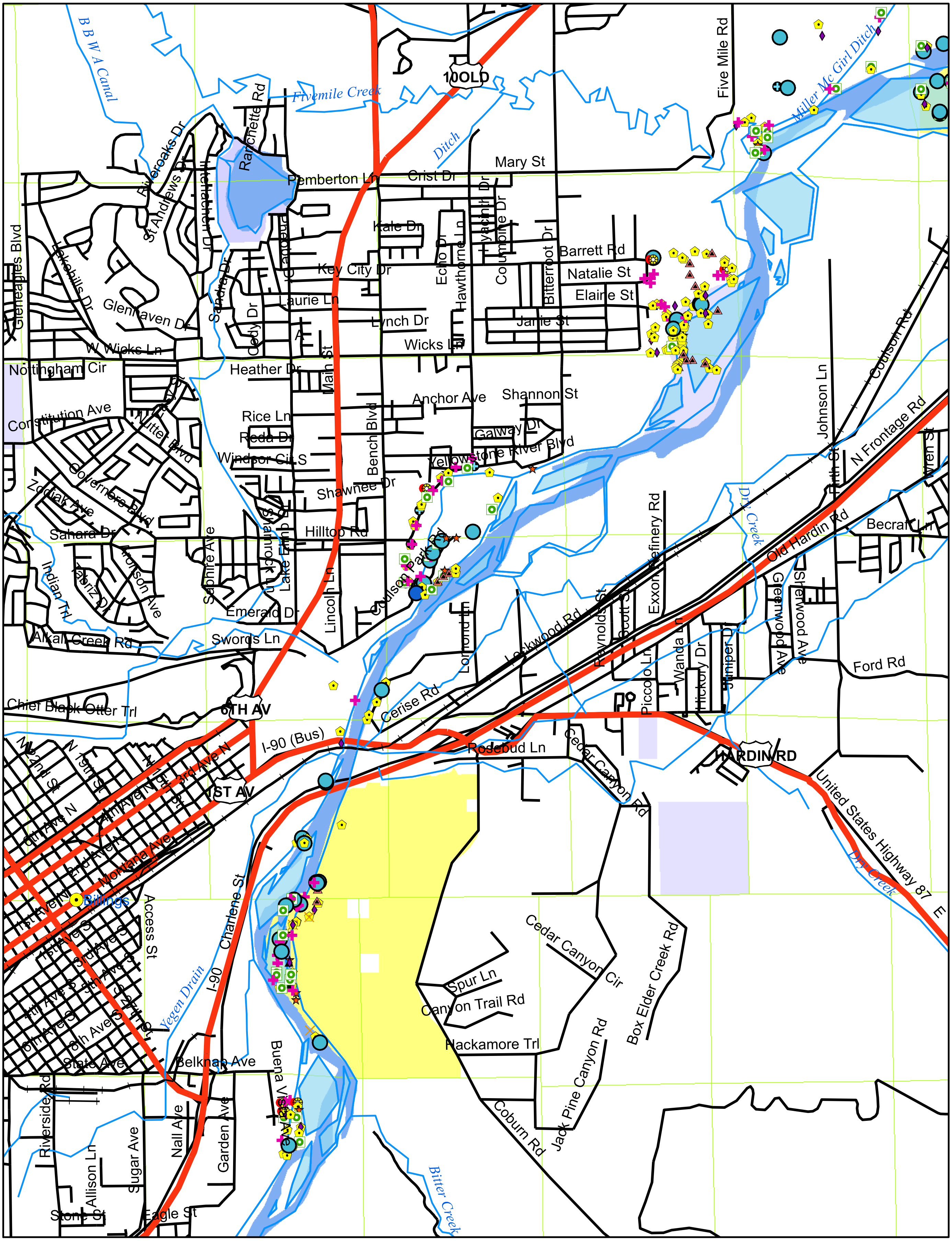


Hysham Enterprises

Yellowstone County
Yellowstone River Corridor
Inventory 2002-2003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B B W A Canal
Ditch
Miller Mc Girl Ditch
Pemberton Ln
Crist Dr
Mary St
Five Mile Rd
Barrett Rd
Natalie St
Elaine St
Janie St
Key City Dr
Lynch Dr
Wicks Ln
W Wicks Ln
Glenhaven Dr
Nottingham Cir
Constitution Ave
Heather Dr
Anchor Ave
Shannon St
Rice Ln
Reda Dr
Windsor Cir S
Galway Dr
Yellowstone River Blvd
Shawnee Dr
Hilltop Rd
Sahara Dr
Zodiak Ave
Emerald Dr
Swords Ln
Alkali Creek Rd
Chief Black Otter Trl
6TH AV
I-90 (Bus)
Cerise Rd
Lockwood Rd
Rosebud Ln
HARDIN RD
1ST AV
Montana Ave
Billings
Charlene St
Access St
Yegen Drain
I-90
Belknap Ave
State Ave
Cedar Canyon Rd
Cedar Canyon Cir
Spur Ln
Canyon Trail Rd
Hackamore Trl
Coburn Rd
Jack Pine Canyon Rd
Box Elder Creek Rd
Bitter Creek
Dry Creek
Old Hardin Rd
N Frontage Rd
Coulson Rd
Johnson Ln
Becraft Ln
Ford Rd
United States Highway 87 E
Exxon Refinery Rd
Riverside Rd
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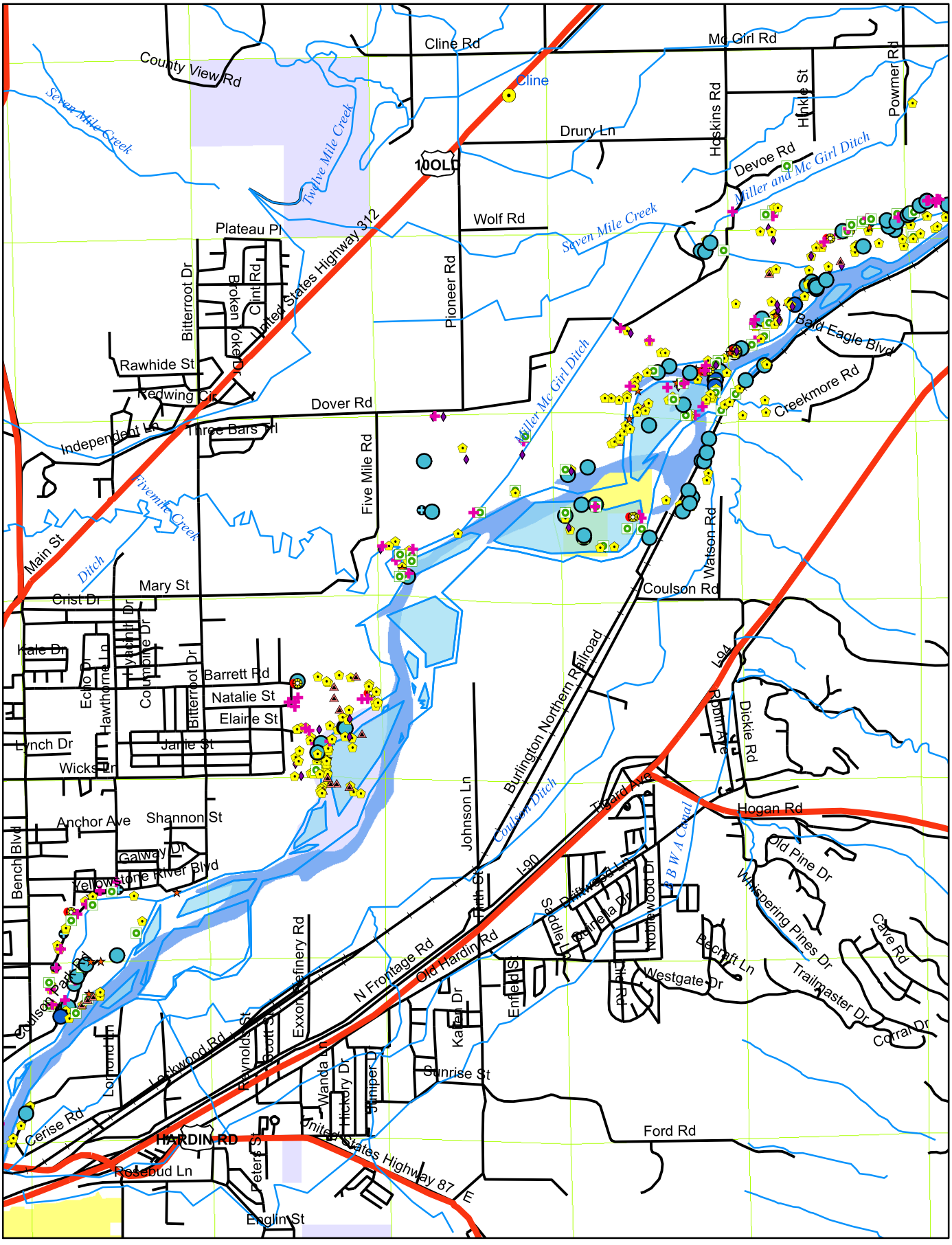
Sugar Ave
Nall Ave
Garden Ave
Stone St
Eagle St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Drury Ln
Hoskins Rd
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Powmer Rd
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Wolf Rd
Seven Mile Creek
Plateau Pl
Bitterroot Dr
Broken Oak Dr
Clint Rd
United States Highway 312
Pioneer Rd
Bald Eagle Blvd
Creekmore Rd
Rawhide St
Redwing Cir
Dover Rd
Miller Mc Girl Ditch
Independent Ln
Three Bars Pl
Five Mile Rd
Fivemile Creek
Main St
Ditch
Mary St
Crist Dr
Coulson Rd
Watson Rd
Kale Dr
Echo Dr
Hawthorne Ln
Wyatt Dr
Columbine Dr
Barrett Rd
Natalie St
Elaine St
Janie St
Lynch Dr
Wicks Dr
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Burlington Northern Railroad
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Dickie Rd
Anchor Ave
Shannon St
Galway Dr
Yellowstone River Blvd
Bench Blvd
Johnson Ln
Coulson Ditch
Heard Ave
Hogan Rd
Old Pine Dr
Whispering Pines Dr
Cave Rd
Trailmaster Dr
Corral Dr
Becraft Ln
Westgate Dr
Nottingwood Dr
S Briarwood Ln
Briarwood Dr
Saddle Ln
Dirt Rd
L90
North St
B W A Canal
Coulson Park Rd
Exxon Refinery Rd
N Frontage Rd
Old Hardin Rd
Enfield St
Kaiser Dr
Lockwood Rd
Lockwood St
Scott St
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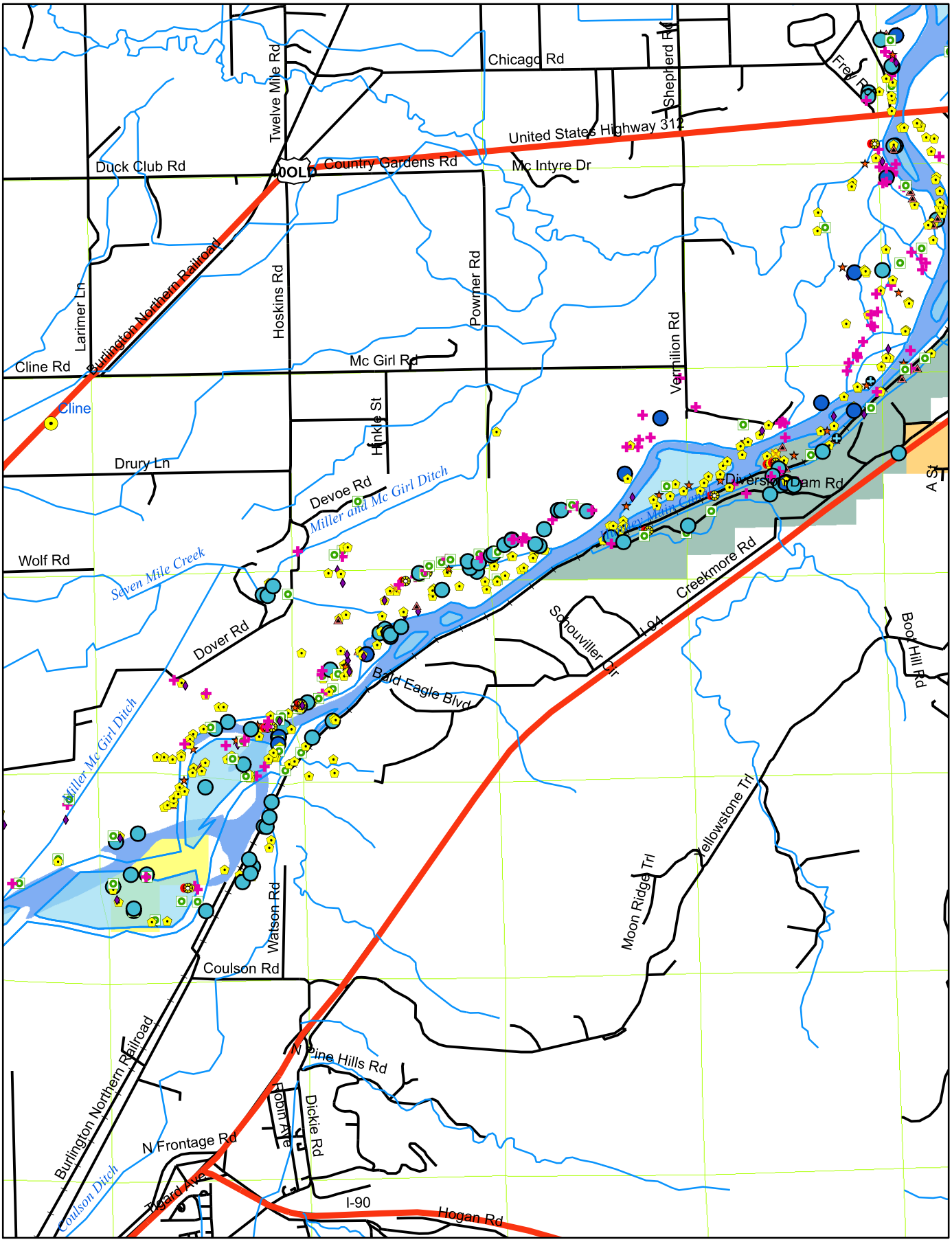
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Shepherd Rd
Frey Rd
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Duck Club Rd
Country Gardens Rd
Mc Intyre Dr
Larimer Ln
Burlington Northern Railroad
Hoskins Rd
Powmer Rd
Vermilion Rd
Cline Rd
Mc Girl Rd
Cline
Hinkle St
Drury Ln
Devoe Rd
Miller and Mc Girl Ditch
Diversion Dam Rd
A St
Wolf Rd
Seven Mile Creek
Creekmore Rd
Dover Rd
Schouviller Cir
I-94
Bald Eagle Blvd
Boot Hill Rd
Miller Mc Girl Ditch
Yellowstone Trl
Moon Ridge Trl
Watson Rd
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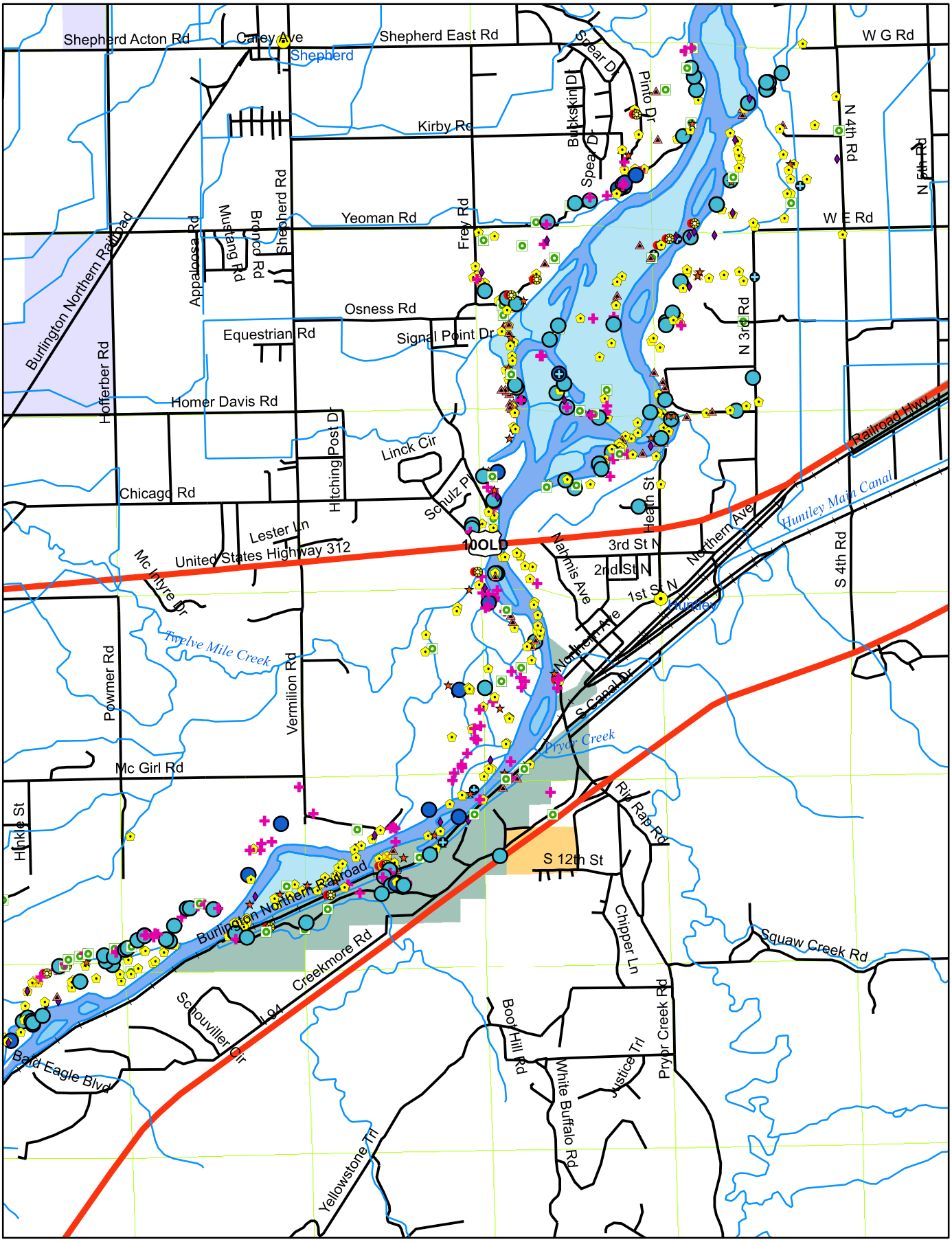
Heard Ave
I-90
Hogan Rd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W G Rd
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Osness Rd
Equestrian Rd
Signal Point Dr
Homer Davis Rd
Chicago Rd
Lester Ln
United States Highway 312
100LD
3rd St N
2nd St N
1st St N
Hysham
Railroad Hwy
Huntley Main Canal
Twelve Mile Creek
Pryor Creek
S 12th St
Rip Rap Rd
Squaw Creek Rd
Creekmore Rd
Burlington Northern Railroad
Bald Eagle Blvd
Yellowstone Trl
Boot Hill Rd
White Buffalo Rd
Justice Trl
Pryor Creek Rd
Chipper Ln
Schouviller Cir
I-94
Hofferber Rd
Appaloosa Rd
Mustang Rd
Bronco Rd
Shepherd Rd
Frey Rd
Butkskin Dr
Spear Dr
Pinto Dr
N 4th Rd
N 5th Rd
N 3rd Rd
Linck Cir
Schulz Pl
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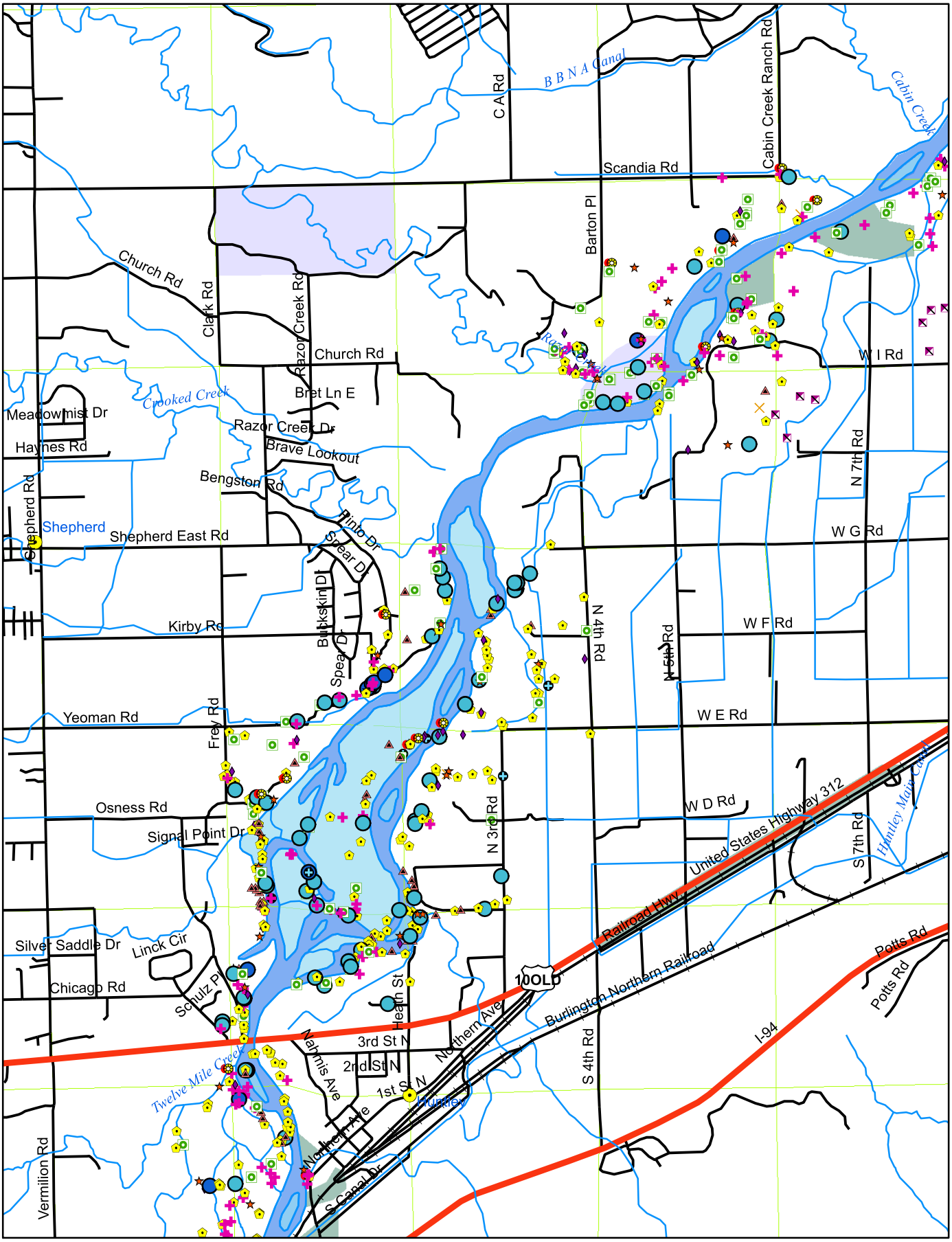
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Cabin Creek
Scandia Rd
Barton Pl
Church Rd
Clark Rd
Razor Creek Rd
Church Rd
Razor Creek
W I Rd
Crooked Creek
Bret Ln E
Meadowmist Dr
Razor Creek Dr
Haynes Rd
Brave Lookout
Bengston Rd
N 7th Rd
Shepherd Rd
Shepherd
Shepherd East Rd
Pinto Dr
Spear Dr
W G Rd
Buckskin Dr
Kirby Rd
Spear Dr
N 4th Rd
W F Rd
N 5th Rd
Yeoman Rd
Frey Rd
W E Rd
Osness Rd
W D Rd
Signal Point Dr
N 3rd Rd
United States Highway 312
S 7th Rd
Hynley Main Canal
Railroad Hwy
Silver Saddle Dr
Linck Cir
Chicago Rd
Schulz Pl
Heath St
100LD
Burlington Northern Railroad
Potts Rd
Potts Rd
Northern Ave
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1st St N
Twelve Mile Creek
Hynley
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I-94
Northern Ave
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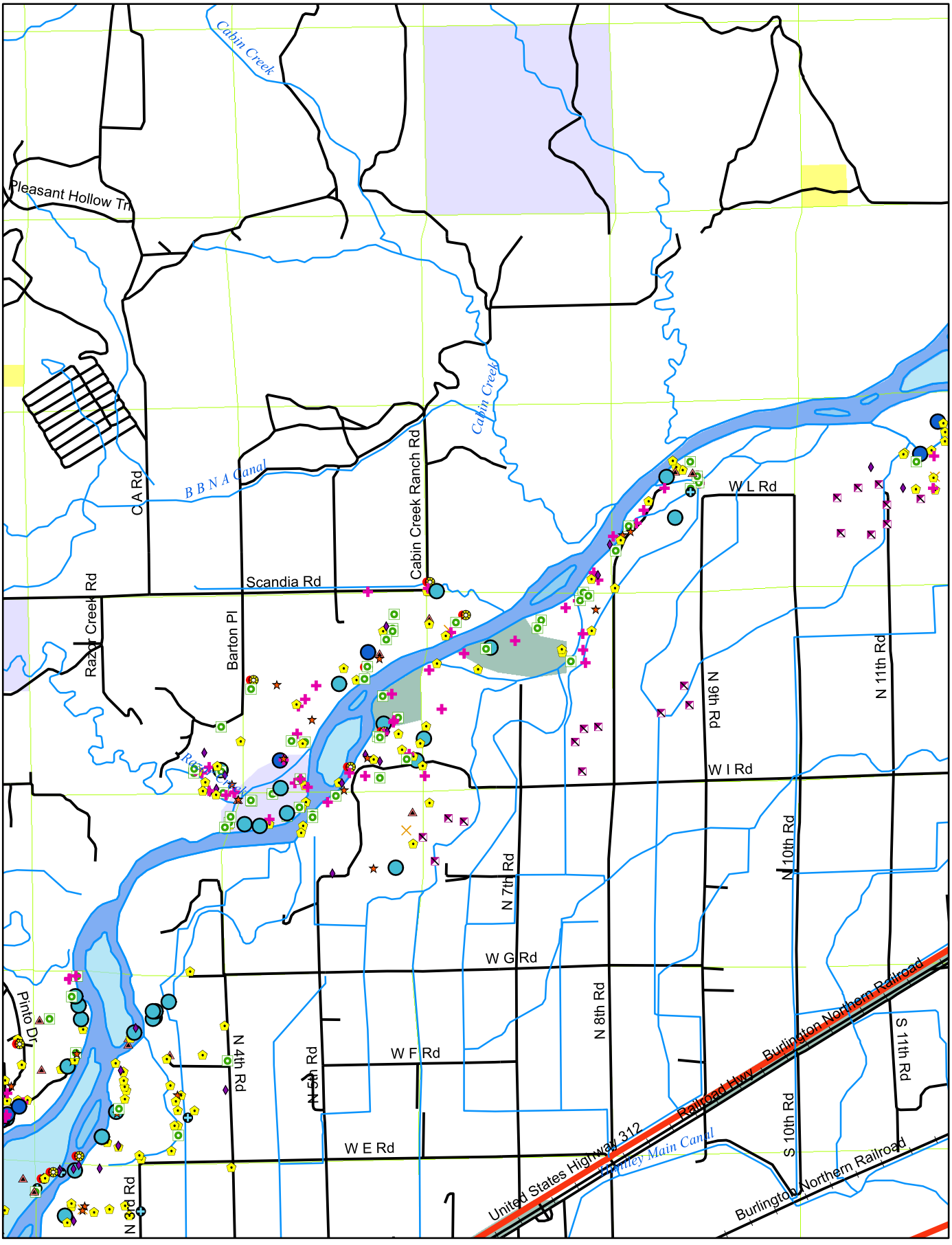
Vermilion Rd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Pleasant Hollow Tr
CA Rd
B B N A Canal
Cabin Creek Ranch Rd
Cabin Creek
W L Rd
Scandia Rd
Razor Creek Rd
Barton Pl
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N 11th Rd
W I Rd
N 7th Rd
N 10th Rd
W G Rd
Pinto Dr
N 8th Rd
S 11th Rd
N 4th Rd
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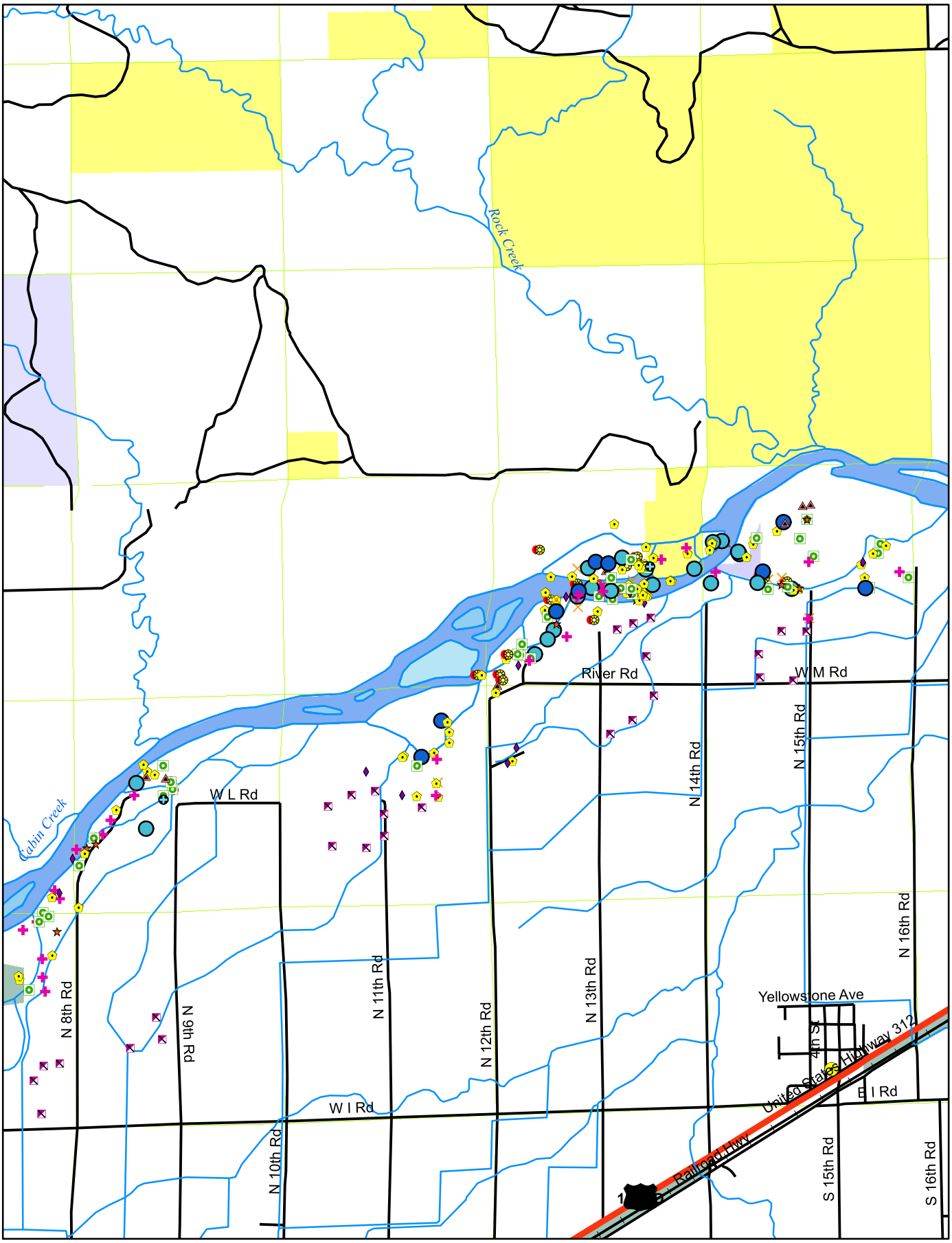
Burlington Northern Railroad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W L Rd
W I Rd
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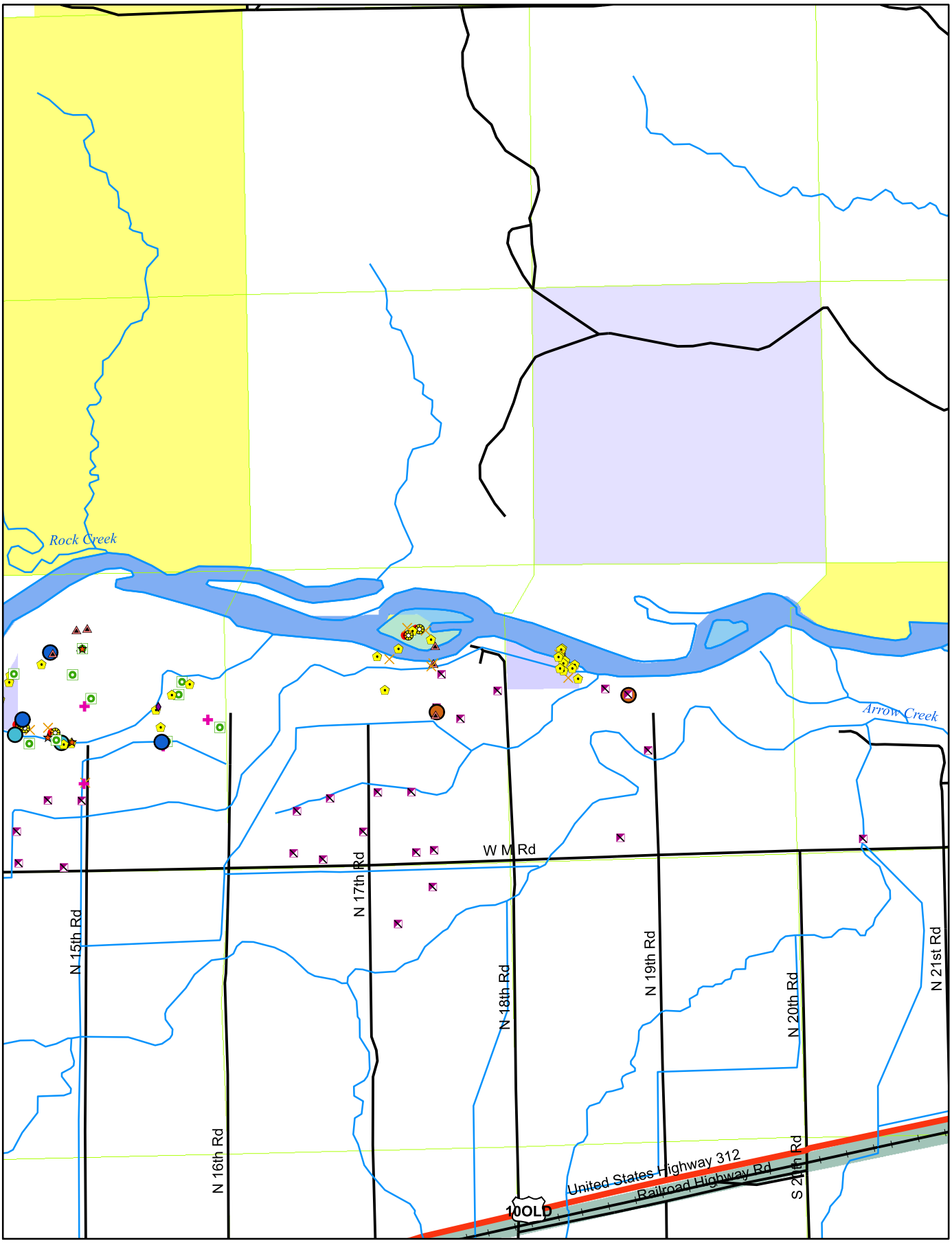
E I Rd
Railroad Hwy
S 15th Rd
S 16th Rd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N 18th Rd
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N 20th Rd
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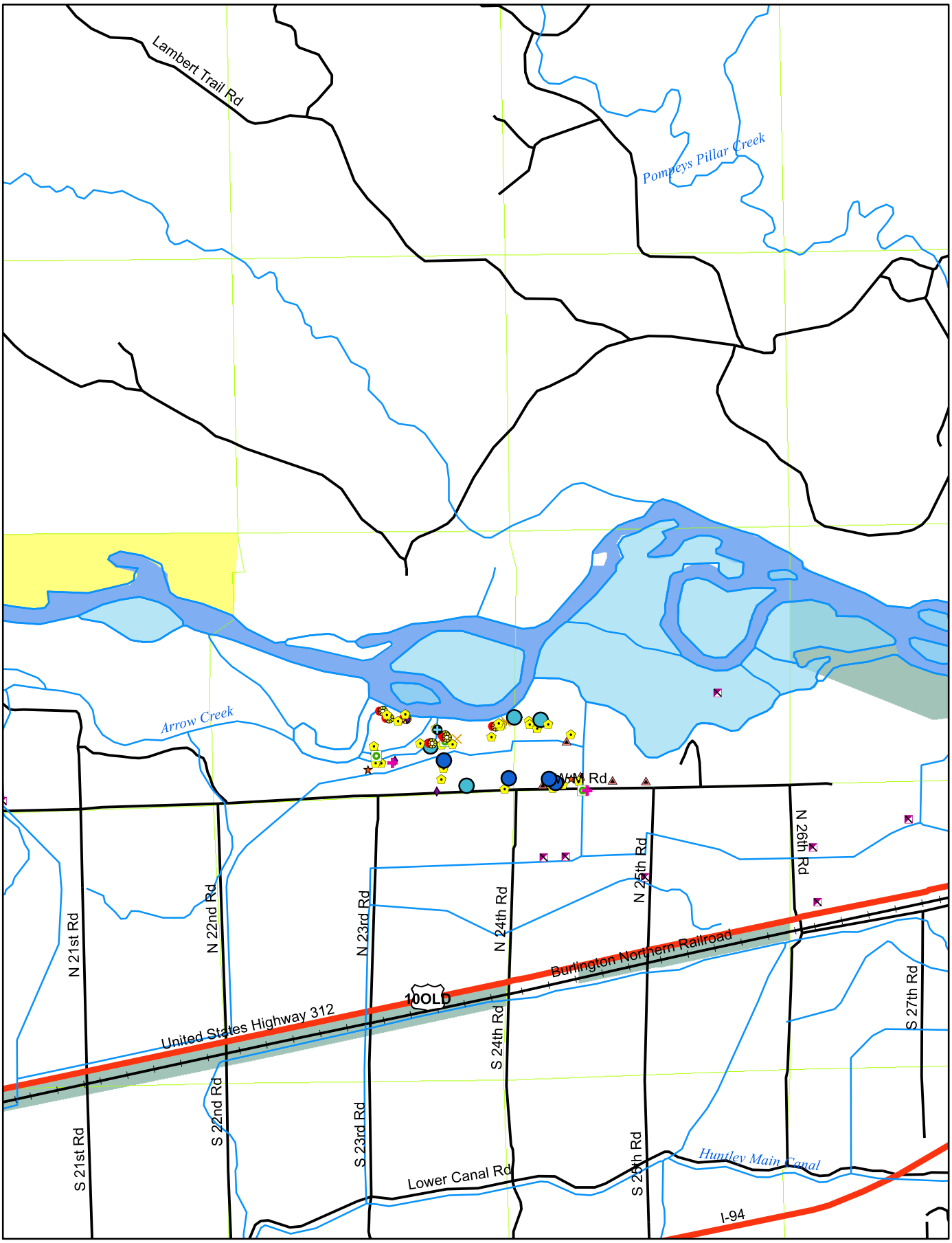
Railroad Highway Rd
100LD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Pompeys Pillar Creek
Arrow Creek
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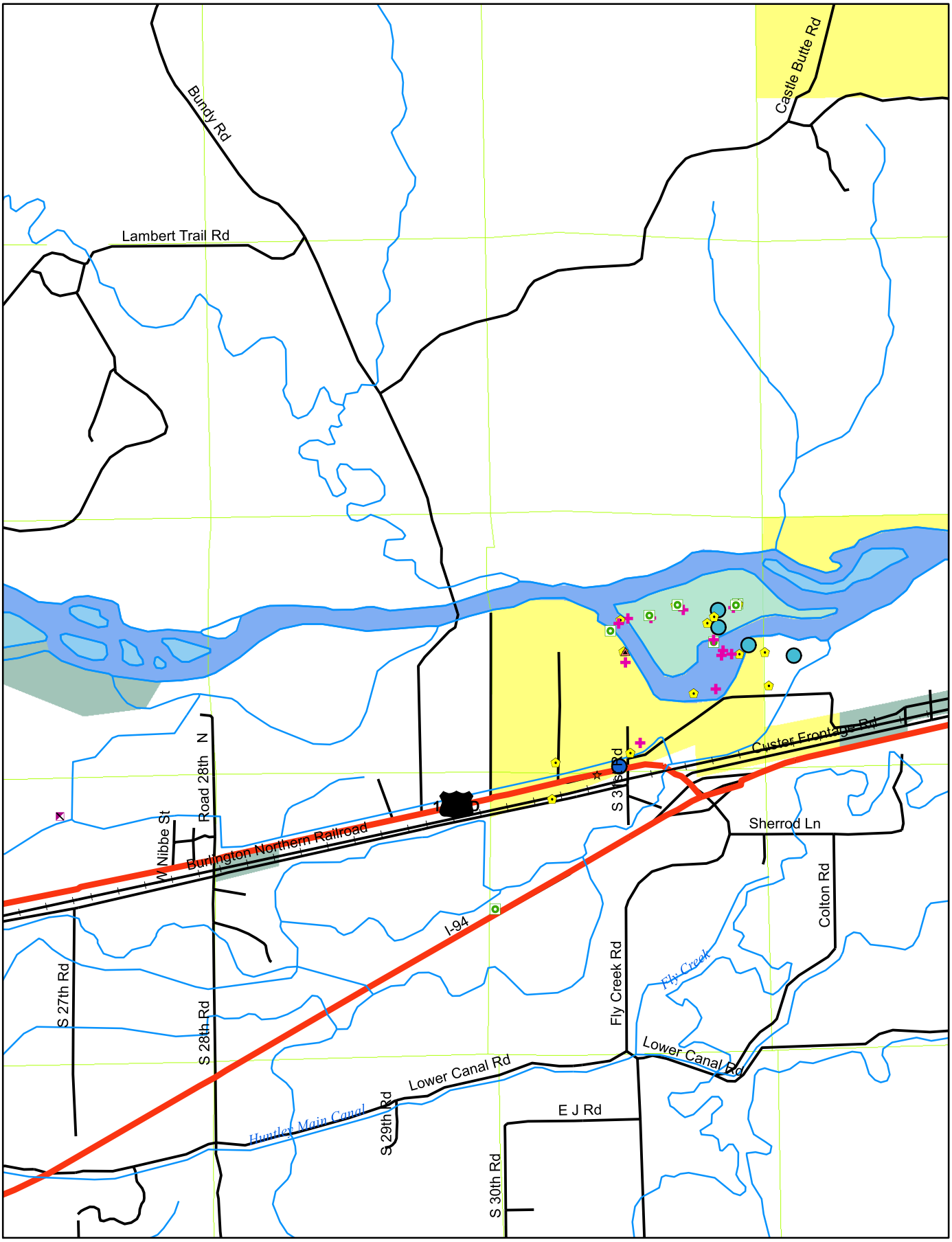
N 23rd Rd
N 24th Rd
N 25th Rd
N 26th Rd
Burlington Northern Railroad
100LD
United States Highway 312
S 21st Rd
S 22nd Rd
S 23rd Rd
S 24th Rd
S 26th Rd
S 27th Rd
Lower Canal Rd
Huntley Main Canal
I-94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Custer Frontage Rd
S 31st Rd
Sherrod Ln
Colton Rd
Burlington Northern Railroad
W Nibbe St
N Road 28th
I-94
S 27th Rd
S 28th Rd
Fly Creek Rd
Fly Creek
Lower Canal Rd
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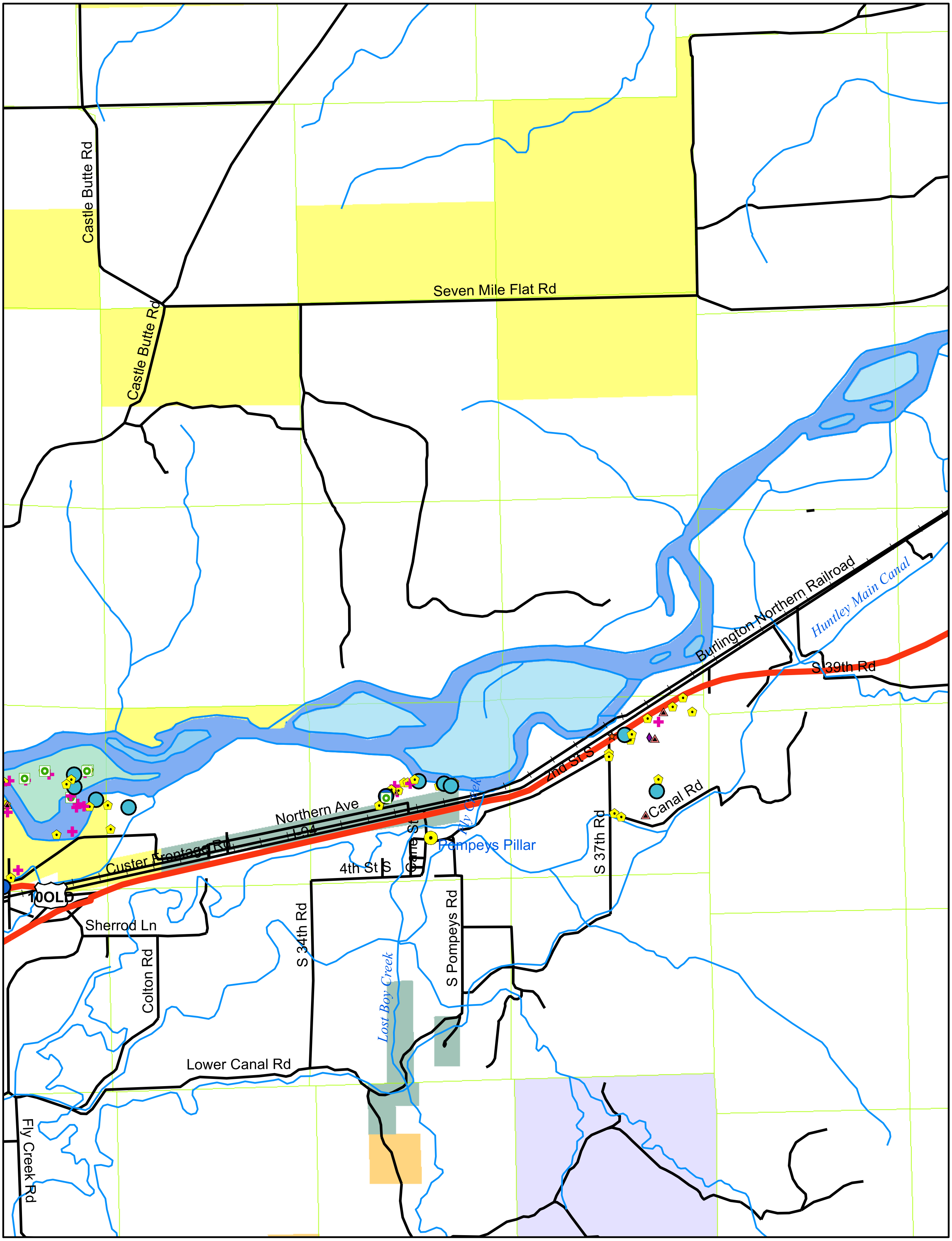
S 29th Rd
E J Rd
Huntley Main Canal
S 30th Rd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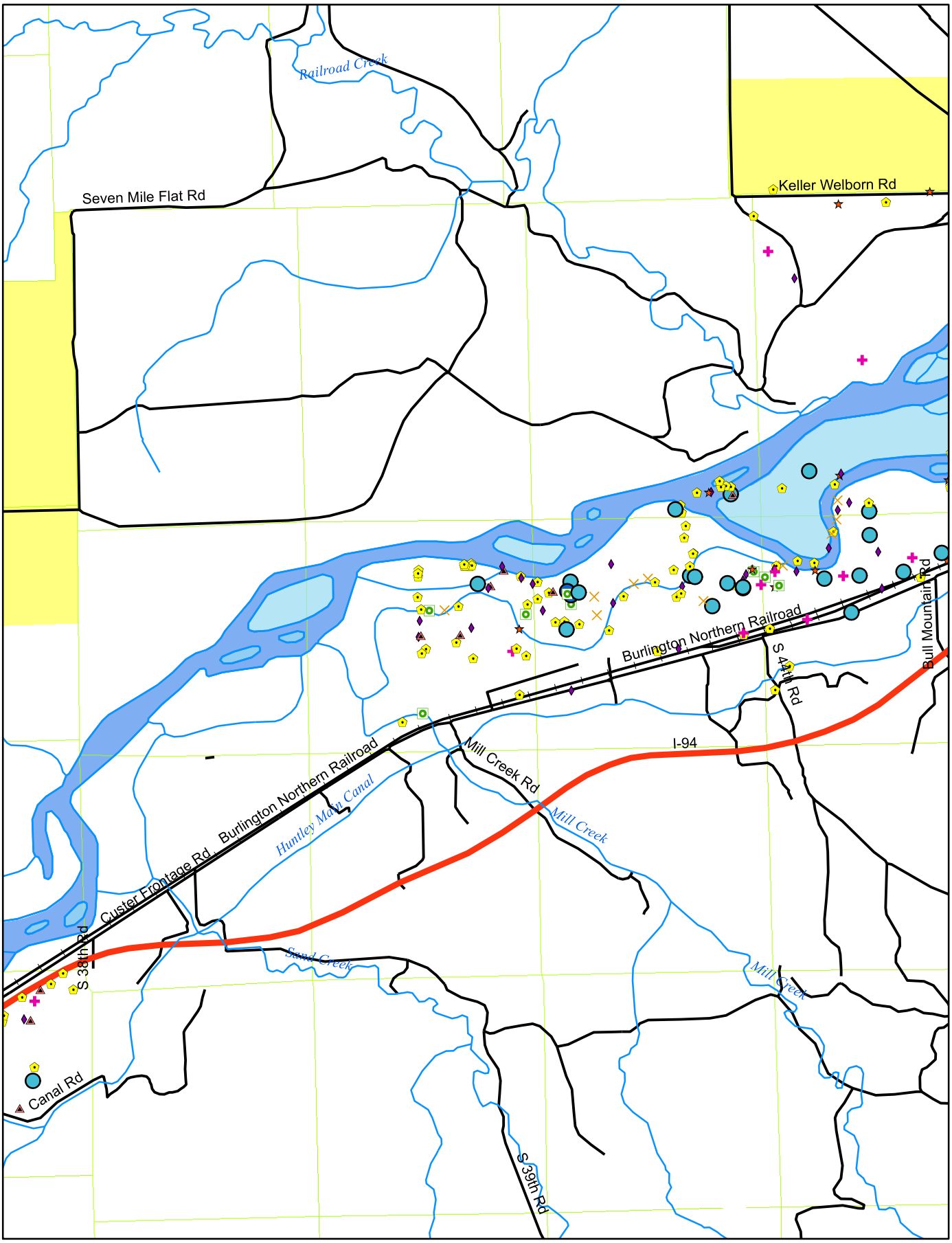
Seven Mile Flat Rd
Castle Butte Rd
Burlington Northern Railroad
Huntley Main Canal
S 39th Rd
2nd St S
Canal Rd
Fly Creek
Northern Ave
I-94
Pompeys Pillar
Custer Frontage Rd
4th St S
S 37th Rd
10OLD
Sherrod Ln
S 34th Rd
S Pompeys Rd
Colton Rd
Lost Boy Creek
Lower Canal Rd
Fly Creek Rd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Keller Welborn Rd
Burlington Northern Railroad
S 44th Rd
Bull Mountain Rd
I-94
Mill Creek Rd
Mill Creek
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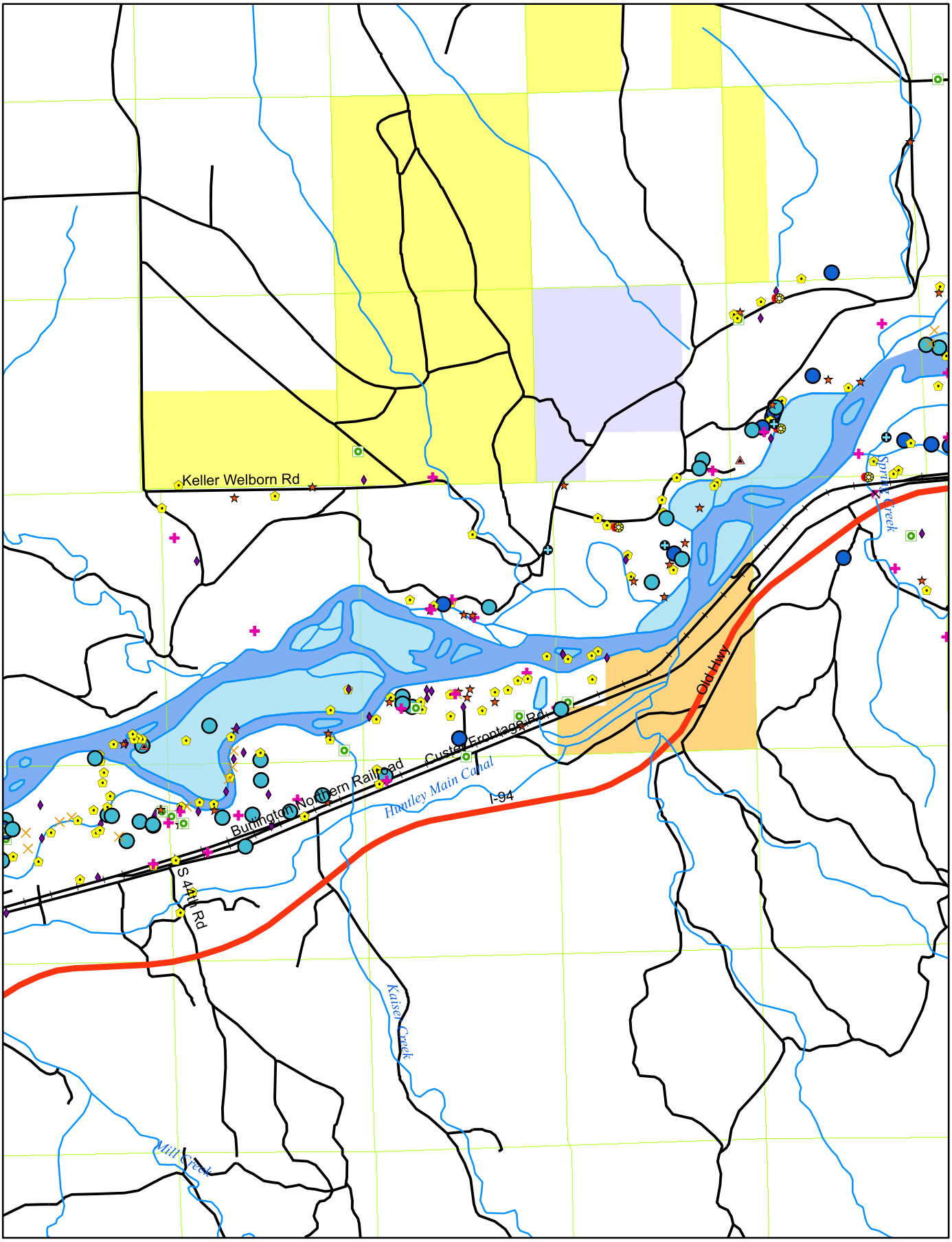
Sand Creek
Mill Creek
S 39th Rd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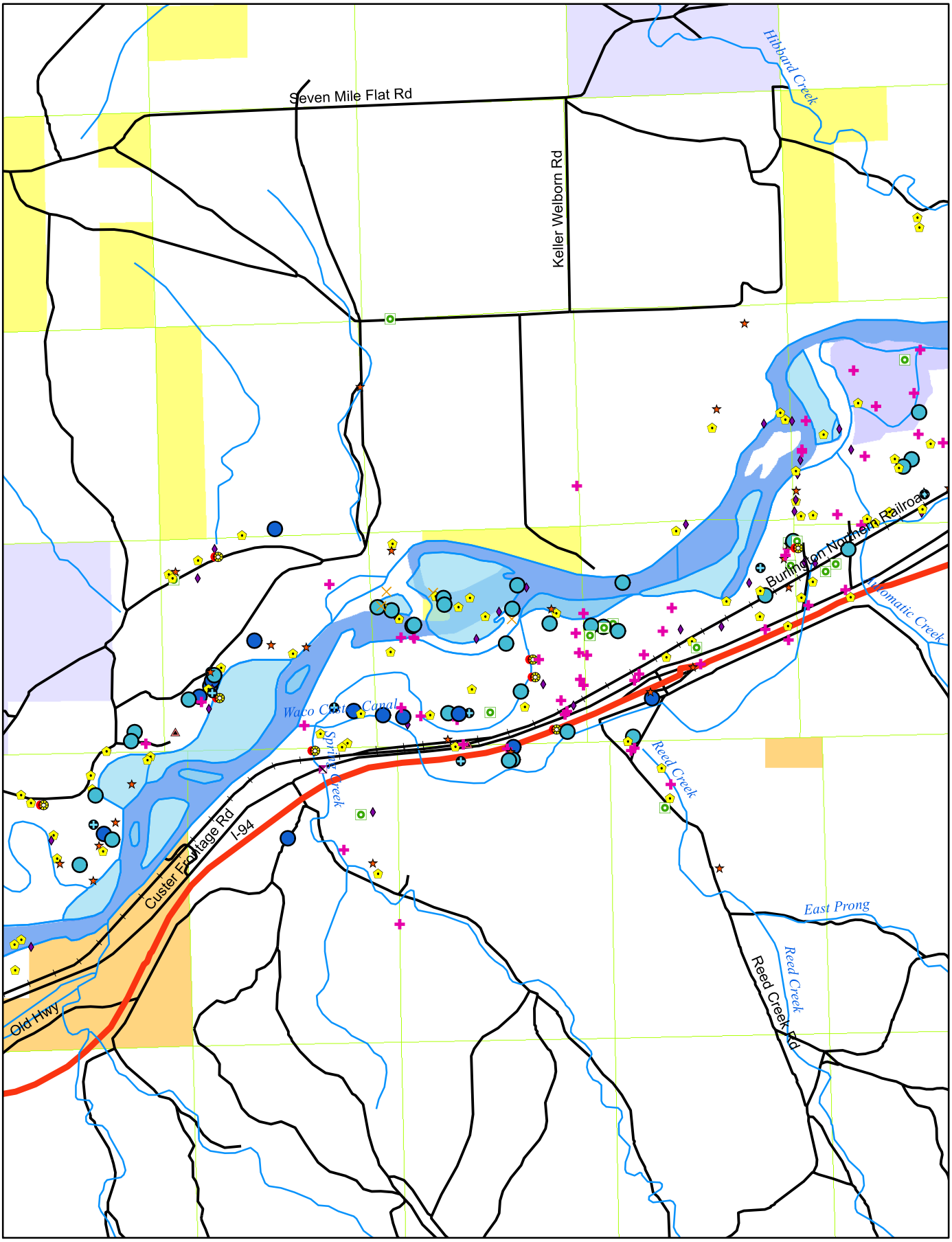
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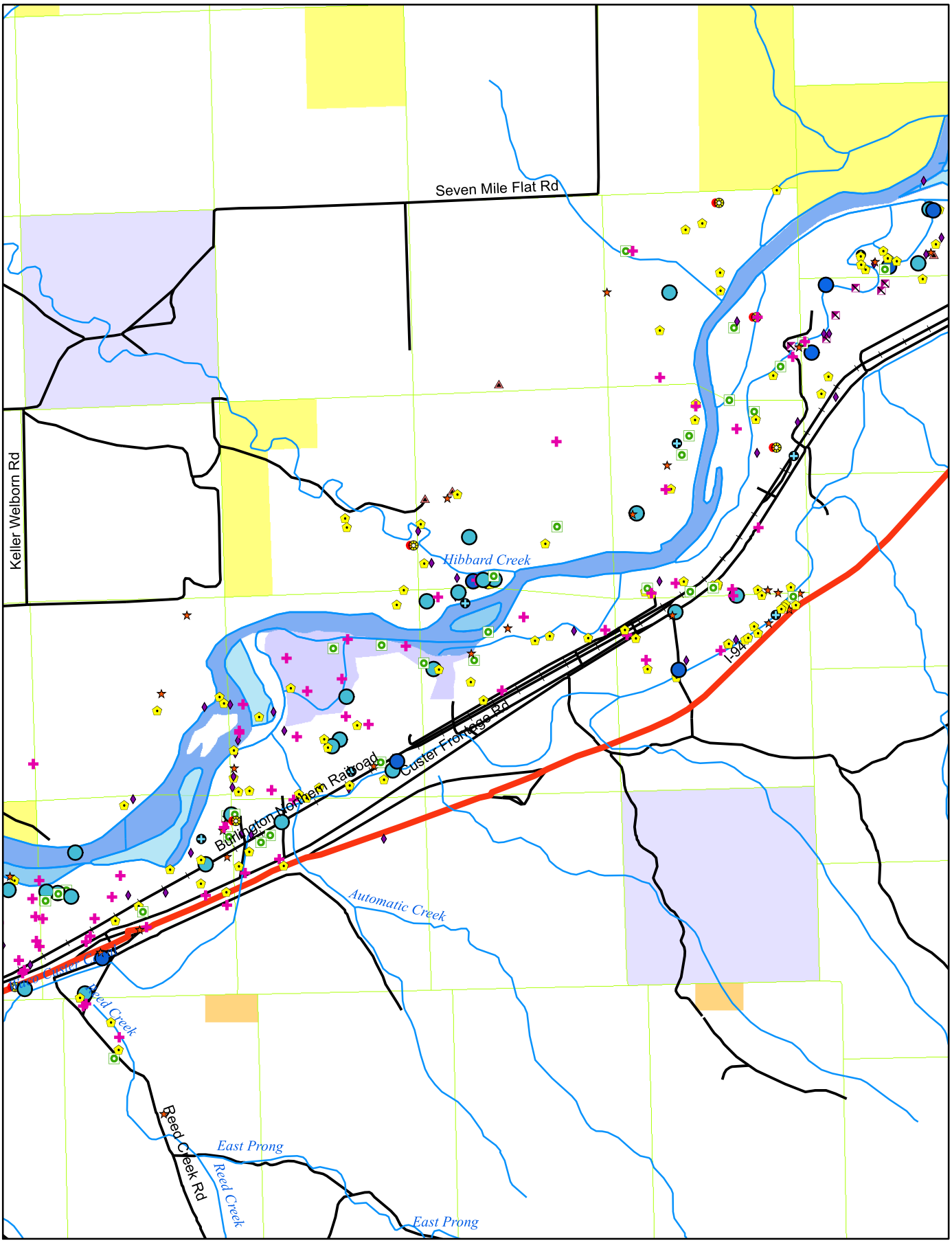
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Reed Creek
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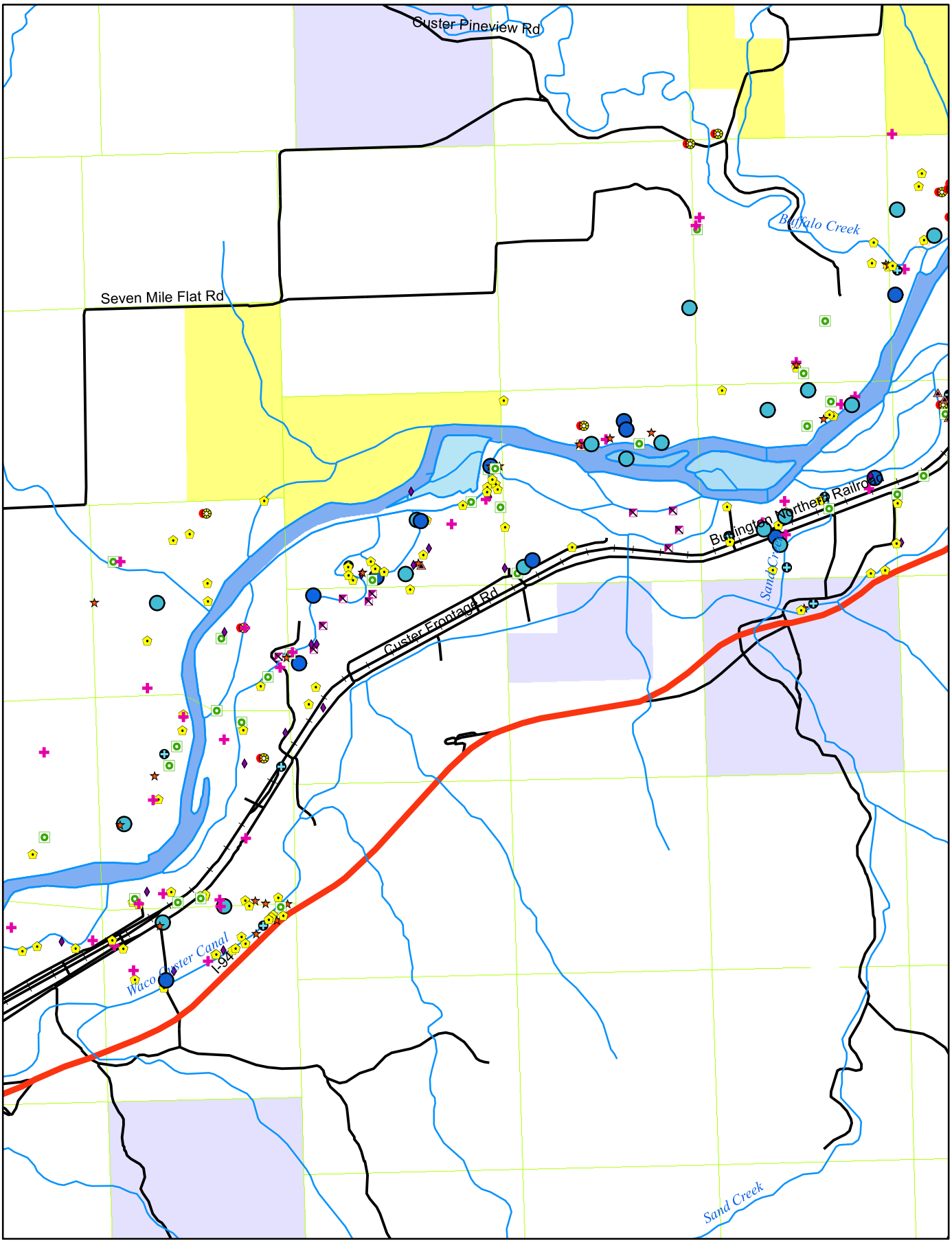
East Prong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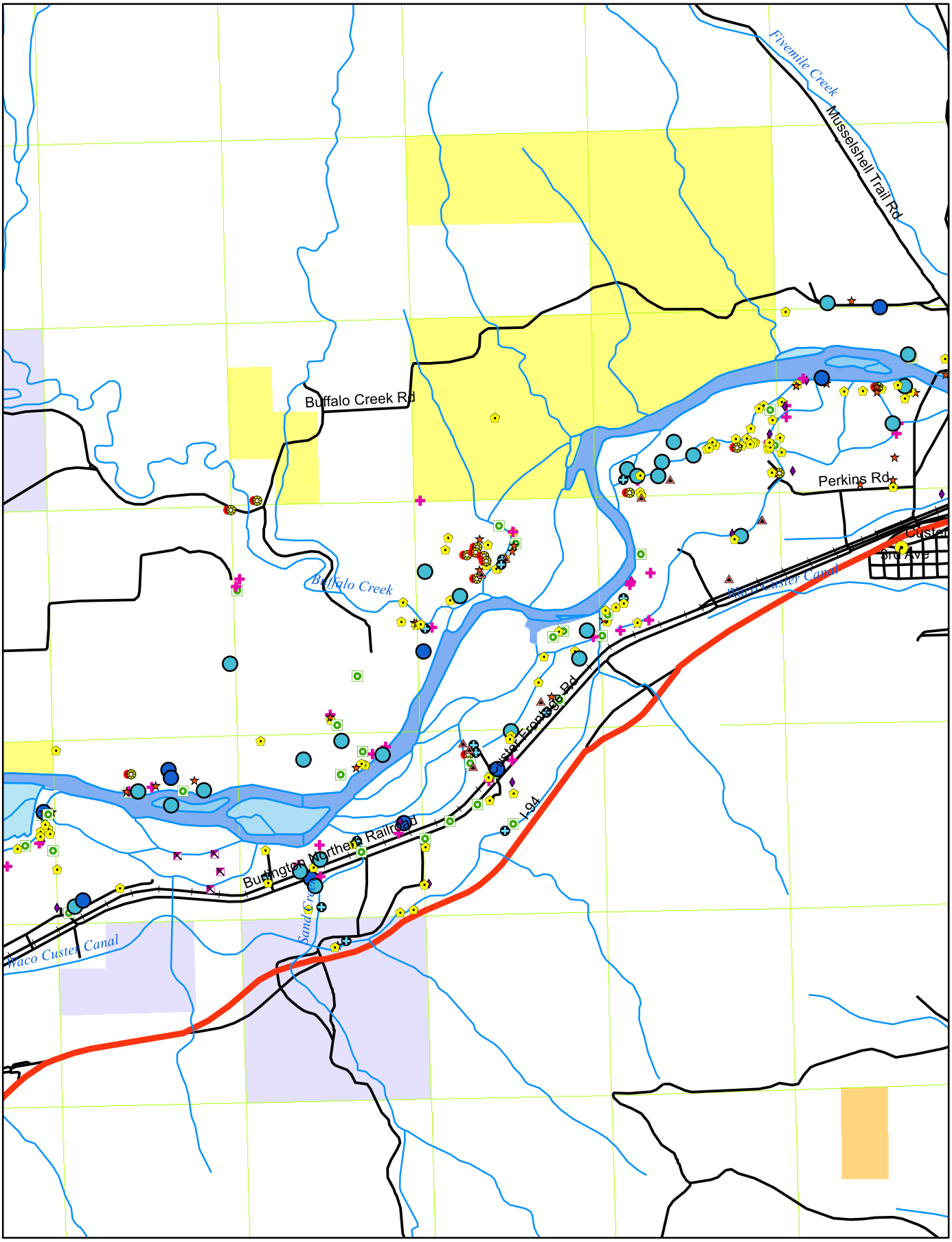
Burlington Northern Railroad
Custer Frontage Rd
Waco Custer Canal
I-94
Sand Creek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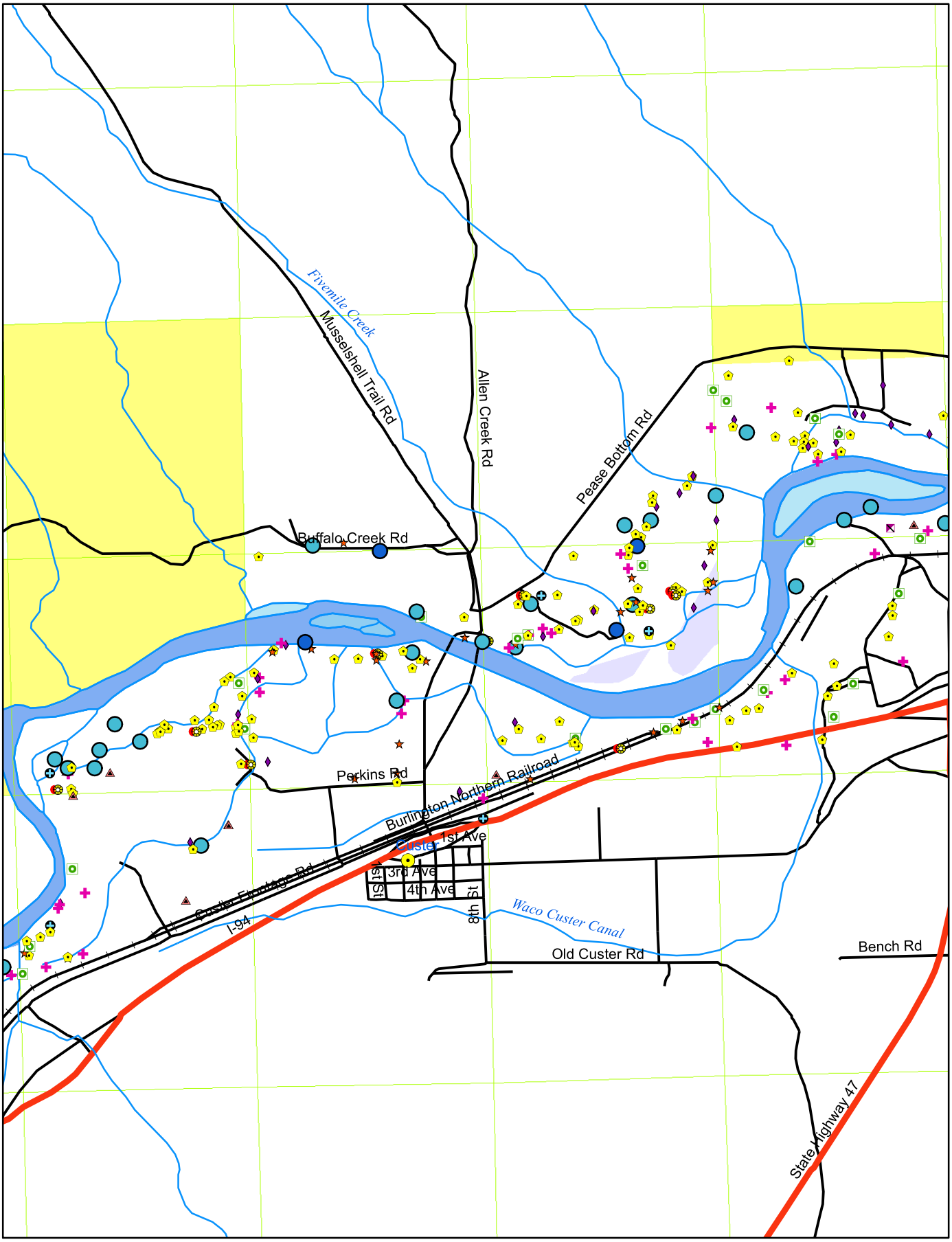
Waco Custer Canal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8th
Custer Frontage Rd
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Old Custer Rd
Bench Rd
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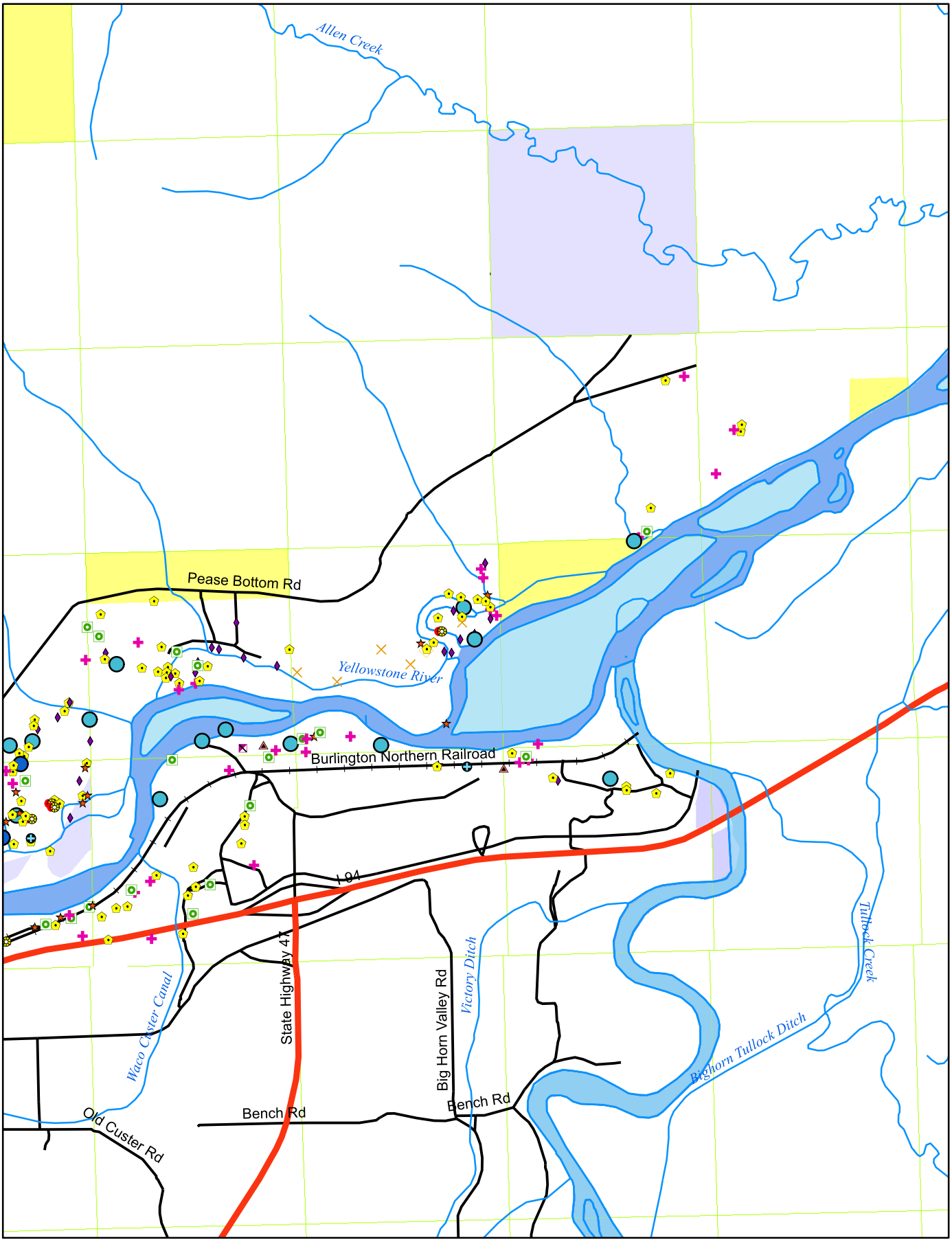
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Yellowstone River
Burlington Northern Railroad
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Victory Ditch
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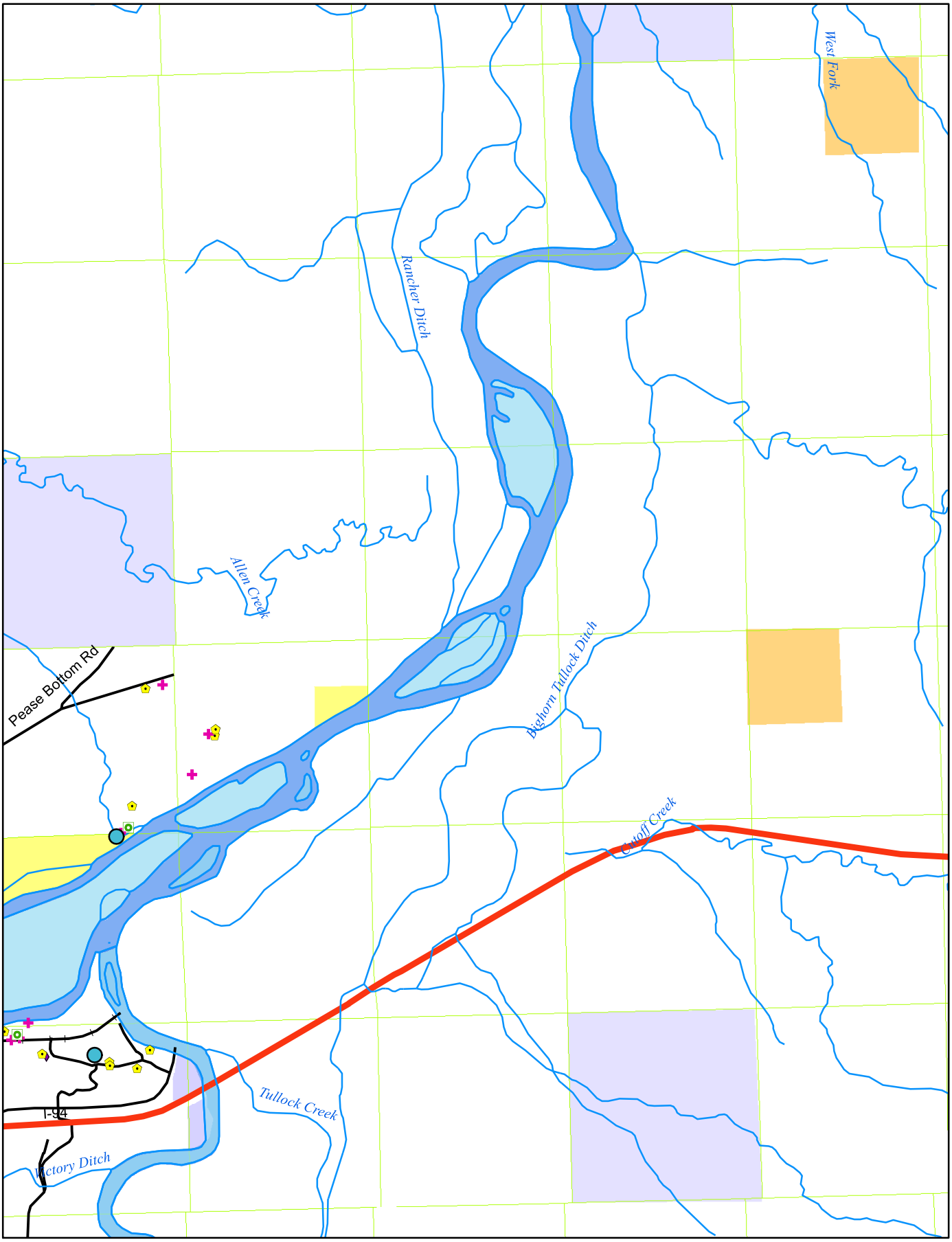
Old Custer Rd
Bench Rd
Bench Rd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Rancher Ditch
Allen Creek
Pease Bottom Rd
Bighorn Tullock Ditch
Cutoff Creek
Tullock Creek
I-94
Victory Ditch

Yellowstone River Inventory Project 2002 – Acreage Analysis

Total Acres Covered

26183.35

Public Lands Covered

		Covered Acres
Montana Department of Fish Wildlife and Parks		253.800
Bureau Of Land Management		327.050
Montana Department Of State Lands		303.110
City Of Billings		258.800
Yellowstone River Parks Association		41.508
City Of Billings and Yellowstone County		51.704
Yellowstone County		389.917
Lockwood Irrigation District		9.142
Lockwood Area/Yellowstone County Sewer District		7.678
Huntley Project Irrigation District		5.886
	Total	**1648.595**

Private Lands Covered

24534.3

Infested Acres By Species

	Total Acres	Percentage of Total Infested Acres	Percentage of Acres Covered
Blackhenbane	41.9540	1.712%	0.16023%
Canada Thistle	621.9670	25.376%	2.37543%
Common Burdock	10.5000	0.428%	0.04010%
Common Crupina	0.3500	0.014%	0.00134%
Common Mullien	78.6290	3.208%	0.30030%
Field Bindweed	17.5700	0.717%	0.06710%
Hounds Tongue	112.4900	4.590%	0.42962%
Leafy Spurge	768.5350	31.356%	2.93520%
Musk Thistle	0.2000	0.008%	0.00076%
Poison Hemlock	13.5640	0.553%	0.05180%
Russian Knapweed	113.6250	4.636%	0.43396%
Salt Cedar	350.2350	14.289%	1.33762%
Scotch Thistle	26.2290	1.070%	0.10017%
Spotted Knapweed	291.6530	11.899%	1.11389%
Whitetop	3.5000	0.143%	0.01337%
Total Infestation	**2451.001**		**9.36091%**

Appendix G – County Weed District Contact List

Park County Weed District	Clay Williams clay@parkcounty.org 406-222-4156	414 E Callender Livingston, MT 59047
Sweet Grass County Weed District	Stacey Barta sgcoweed@mtintouch.net 406-932-5146	P.O. Box 640 Big Timber, MT 59011
Stillwater County Weed	Wayne Pearson 406-328-4165	P.O. Box 344 Absarokee, MT 59001
Carbon County Weed District	Jerry Webber jerrysweeds@yahoo.com 406-962-3967	P.O. Box 255 Joliet, MT 59041
Yellowstone County Weed Dept.	Scott Bockness sbockness@co.yellowstone.mt.us 406-256-2731	3319 King Ave E. Billings, MT 59101
Treasure County Weed District	Jennifer Cramer treasureweed@rangeweb.net 406-342-5549	P.O. Box 163 Hysham, MT 59038
Rosebud County Weed District	Amy Adler rosebudweed@rangeweb.net 406-346-7608	P.O. Box 962 Forsyth, MT 59327
Custer County Weed	Paul Helland p.helland@co.custer.mt.us 406-874-3370	1010 Main – Courthouse Miles City, MT 59301
Prairie County Weed District	Ray Dolotta acssmm@montana.edu 406-635-4433	P.O. Box 7 Terry, MT 59349
Dawson County Weed District	dcweed@midrivers.com 406-377-6546	207 W. Bell Glendive, MT 59330
Richland County Weed District	Ken Babcock richweed@midrivers.com 406-433-9047	2750 West Holly Sidney, MT 59270
McKenzie County Weed Control	Odin Helm mcweed@restel.net 701-842-4131	P.O. Box 930 Watford City, ND 58854

Appendix H – Internet Links

USDA-NRCS. The PLANTS Database (http://plants.usda.gov/)

Wyoming Weed and Pest Council (http://www.wyoweed.org)

Montana Weed Control Association (http://www.mtweeds.org/)

North Dakota Weed Control Association (http://ndweeds.homestead.com)

Noxious and Nuisance Plant Management Information System (*http://www.wes.army.mil/el/pmis/pmishelp.htm*)

Thomas J. Elpel's, Wildflowers & Weeds Home Page (*http://www.wildflowers-and-weeds.com*)

Appendix I – References Cited

1 Rice, Peter M. 2004, In: Invaders Database [Online]. Division of Biological Sciences, University of Montana. Available: http://invader.dbs.umt.edu/

2 Robert Wilson – Extension Weed Specialist, 2002. Noxious Weeds of Nebraska, University of Nebraska Coop. Extension EC02-171-S

3 Zouhar, Kris 2001. Cirsium arvense. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2005, March 9].

4 Susan Weaver - W. R. Riley – OMAF. Factsheet: Fieldbindweed, [Online]. Agriculture and Agri-Food Canada; Available: http://www.gov.on.ca/OMAFRA/english/crops/facts/01-007.htm [2005, March 13]

5 Unknown, 2003. How to Manage Pests Pests in Landscapes and Gardens: Fieldbindweed, [Online]. University of California – Agriculture and Natural Resources. Available: http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7462.html [2005, March 13]

6 Elpel, Thomas J., Wildflowers and Weeds, Whitetop or Hoary Cress--Cardaria draba, C. chalapa, C. pubescens, [Online]. Available: http://www.wildflowers-and-weeds.com/weedsinfo/Cardaria_spp.htm [2005, March 13]

7 Troublesome Weeds of the Rocky Mountain West, Sixth Edition-2000. Colorado Weed Management Association

8 Elpel, Thomas J., Wildflowers and Weeds, Leafy Spurge--Euphorbia escula [Online]. Available: http://www.wildflowers-and-weeds.com/weedsinfo/Euphorbia_escula.htm, [2005, March 13]

9 Duncan, C., Story, J., Sheley, R., Rev. March 2002. Montana Knapweeds: Identification, Biology, and Management. Montana State University Extension Service;

10 Elpel, Thomas J., Wildflowers and Weeds, Centaurea repens--Russian Knapweed [Online]. Available: http://www.wildflowers-and-weeds.com/weedsinfo/Centaurea_repens.htm, [2005, March 13]

11 Mauer, Teresa, Russo, Mary J. (Revision), Evans, Margaret (Revision). Element Stewardship Abstract for Centaurea malculosa., [Online]. The Nature Concervancy. Available: http://tncweeds.ucdavis.edu/esadocs/documnts/centmac.html [2005, March 13]

12 Elpel, Thomas J., Wildflowers and Weeds, Centaurea maculosa, C. diffusa--Spotted and Diffuse Knapweed [Online]. Available: http://www.wildflowers-and-weeds.com/weedsinfo/Centaurea_spp.htm, [2005, March 13]

13 Elpel, Thomas J., Wildflowers and Weeds, Centaurea maculosa, C. diffusa--Spotted and Diffuse Knapweed [Online]. Available: http://www.wildflowers-and-weeds.com/weedsinfo/Centaurea_spp.htm, [2005, March 13]

14 Elpel, Thomas J., Wildflowers and Weeds, Linaria genistifolia (L. dalmatica), L. vulgaris--Dalmation and Yellow Toadflax [Online]. Available: http://www.wildflowers-and-weeds.com/weedsinfo/Linaria_spp.htm, [2005, March 13]

15 Elpel, Thomas J., Wildflowers and Weeds, Hypericum perforatum:--St. Johnswort [Online]. Available: http://www.wildflowers-and-weeds.com/weedsinfo/Hypericum_perforatum.htm, [2005, March 13]

16 Sulfur Cinquefoil: Biology, Ecology & Management in Pasture and Rangeland. Montana State University Extension Service, EB 109, Revised March 1994

17 LeCain, Ron and Sheley, Roger. Montguide: Common tansy (Tanacetum vulgare) [Online]. Montana State University Extension Service. Available: http://www.montana.edu/wwwpb/pubs/mt9911.html. [2005, March 13]

18 Elpel, Thomas J., Wildflowers and Weeds, Tanacetum vulgare--Common Tansy [Online]. Available: http://www.wildflowers-and-weeds.com/weedsinfo/Tanacetum_vulgare.htm, [2005, March 13]

19 Elpel, Thomas J., Wildflowers and Weeds, Chrysanthemum leucanthemum--Oxeye Daisy [Online]. Available: http://www.wildflowers-and-weeds.com/weedsinfo/Chrysanthemum_leucanthemum.htm, [2005, March 13]

20 Boulder County Colorado – Parks and Open Space, Weeds of Special Concern – Houndstongue, [Online] Available: http://www.co.boulder.co.us/openspace/resources/weeds/spc_hounds.htm. [2005, March 13]

21 Carpenter, Alan & Murray, Thomas, Mojave Weed Mangement Area: Dalmatian toadflax (Linaria dalmatica) [Online], Land Stewardship Consulting. Available: http://www.mojavewma.org/toadflax.php. [2005, March 13]

22 Miller, Maire & Petitmengin, ELEMENT STEWARDSHIP ABSTRACT: Linaria genistifolia (L.) AND Linaria vulgaris. [Online], The Nature Conservancy. Available: http://tncweeds.ucdavis.edu/esadocs/documnts/linadal.html

23 Written Findings of the State Noxious Weed Control Board - Class A Weed: Dyers Woad, December 1999 , [Online] Available: http://www.nwcb.wa.gov/weed_info/Written_findings/Isatis_tinctoria.html [2005 March, 13]

24 Purple Loosestrife in the Great Lakes Region, [Online]. Great Lakes Information Network. Available: http://www.great-lakes.net/envt/flora-fauna/invasive/loosestf.html [2005, March 13]

25 Written Findings of the State Noxious Weed Control Board - Class B - B-Designate Weed: Tansy Ragwort, Available: http://www.nwcb.wa.gov/weed_info/Written_findings/Senecio_jacobaea.html [2005, March 13]

26 Stevens, Larry, Scourge of the West: The Natural History of Tamarisk in the Grand Canyon, [Online], Available: http://gcrg.org/bqr/6-2/scourge.htm [2005, March 13]

27 Written Findings of the State Noxious Weed Control Board - Class B - B-Designate Weed: Yellow Starthistle, Available: http://www.nwcb.wa.gov/weed_info/Written_findings/Centaurea_solstitialis.html [2005, March 13]

28 Written Findings of the State Noxious Weed Control Board - Class C - C-Designate Weed: Common Crupina, Available: http://www.nwcb.wa.gov/weed_info/Written_findings/Crupina_vulgaris.html [2005, March 13]

29 Sheley, Roger L. and Hudak, Joseph M. April 1995, Rush Skeleton Weed – A Threat to Montana's Agriculture

30 Simmons, Kent, Kent Simmons' Aquatic Ecology Help Pages: Eurasian watermilfoil Myriophyllum spicatum L. Available: http://io.uwinnipeg.ca/~simmons/ysesp/exotic4.htm [2005, March 13]

31 All About Flowers: Yellow Flag Iris, [Online]. Available: http://www284.pair.com/florists/all-about-flowers/Yellow-Iris.htm [2005, March 13]

32 Mullenix, Will, April 1998. Kochia (Kochia spp.) Biology Outline & Bibliography, [Online]. Iowa State University Weed Bio Library. Available: http://www.agron.iastate.edu/~weeds/weedbiollibrary/kochiabiblio.html [2005, March 13]

33 Virginia Tech Weed ID Guide. Common Mullein: *Verbascum thapsus* [Online], Available: http://www.ppws.vt.edu/scott/weed_id/vesth.htm [2005, March 21]

34 Western Water-Hemlock (Cicuta douglasii) [Online]. Government of Britsh Columbia – Ministry of Agriculture, Food and Fisheries. Available: http://www.agf.gov.bc.ca/cropprot/whemlock.htm [2005, March 13]

Additional References Cited In Quotations

147. Mitich, Larry W. 1988. Thistles I: Cirsium and Carduus. Weed Technology. 2: 228-229. [5507]

162. Nuzzo, Victoria. (2000). Element stewardship abstract: Cirsium arvense. In: Weeds on the web: The Nature Conservancy wildland invasive species program, [Online]. Available: http://tncweeds.ucdavis.edu/esadocs/cirsarve.html [2001, July 01]. [37486]

153. Morishita, Don W. 1999. Canada thistle. In: Sheley, Roger L.; Petroff, Janet K., eds. Biology and management of noxious rangeland weeds. Corvallis, OR: Oregon State University Press: 162-174. [35719]

Couderc-LeVaillant, M. and C. T. Roche. 1993. Evidence of multiple introduction of *Crupina vulgaris* in infestations in the western United States. Madrono 40:63-65.

Maddox, D.M. 1979. The knapweeds: their economics and biological control in the Western States, U.S.A. Rangelands 1(4):139-141. ill.

Mitich, L.W. 1993. Yellow toadflax. Weed Technology 7:791-793.

Moore and Frankton 1974. Moore and Frankton. 1974. The Thistles of Canada. Canada Dept. of Agriculture. Monograph No. 10.

Rees, N.E. and P.C. Quimby, G.L. Piper, E.M. Coombs, C.E. Turner, N.R. Spencer and L.V. Knutson. 1996. Biological Control of Weeds in the West. Western Society of Weed Science in cooperation with USDA Agricultural Research Service, Montana Department of Agriculture and Montana State University. Bozeman, MT.

Roche, Jr., B.F., and C.J. Talbott. 1986. The collection history of *Centaurea* found in Washington State. Agric. Res. Center Res. Bull. XB0978. Washington State Univ. Coop. Ext., Pullman, WA 36pp.

Stickney, P. F. 1972. Crupina vulgaris (Compositae: Cynareae), new to Idaho and North America. Madrono 21:402

Sweeney, S.J. and K.E. Neiman, Jr., K.A. Lakey. 1992. Alternative Control of Tansy Ragwort. Prepared for Seattle City Light, Environmental Affairs Division, Parametrix, Inc. Final Report of 1986 - 1991.

Thill, D.C., D.L. Zamora, and D. Kidder. 1987. Common crupina: Identification and Biology. University of Idaho Cooperative Extension Current Information Series No. 542.