

**TOBACCO ROOT GEOLOGICAL SOCIETY 45th ANNUAL FIELD CONFERENCE
HAMILTON, MONTANA, JULY 23–27, 2020**



Flat irons marking the Bitterroot Detachment surface (Jeff Lonn)

CONFERENCE REGISTRATION INFORMATION

TRGS will hold its 45th Annual Field Conference in Hamilton, Montana July 23–27, 2020. The Bitterroot region's geology is complex and diverse, ranging from 2 billion-year-old basement to late Quaternary fault scarps. Field trips to nearby mineral resource localities include the Crystal Mountain fluorite mine, the Lower Willow Creek porphyry deposit west of the Black Pine Mine, and recreational sapphire mining from the alluvium along the West Fork of Rock Creek in the Sapphire Mountains. Field trips will examine thrust faults, basement and Belt rocks of the Sapphire Mountains, late Quaternary fault scarps along the Bitterroot fault, and the valley's glacial features. Conference organizers are Jeff Lonn and George Furniss.

******* Covid19 Restrictions *******

Please do not attend this Field Conference if you feel unwell

If you register in advance for this field conference, but elect not to attend because you are unwell at the time of departure, TRGS will refund your registration costs! Many TRGS members may be immune compromised or face medical conditions that may increase risks of more serious illness associated with Covid19 infections. Airborne micro droplets generated during a toilet flush may entrain virus particles within them. Thus, use of the Art building toilets should be carefully considered, and use of a chemical toilet may be a safer choice from a Covid19

perspective. Be advised that you participate in this conference at your own risk. Please follow the guidance from the Montana State Health Department, should you have questions.

We strongly urge social distancing (at least 6 feet) for participants **at all times** during this conference. Please bring your face mask and be prepared to wear it even in the vehicles to/from field trips, and if you have a small bottle of hand sanitizer, please bring it along in your field gear. Frequent hand washing and use of hand sanitizer and face masks is encouraged during the Friday morning talks and subsequent times of poster perusal in the Art building at the Ravalli County Fairgrounds.

The Art building is spacious, but the restrooms will likely be tight. A wipe-down of restroom surfaces in the Art building at the fairgrounds is planned during the Friday morning talks, and throughout the informal poster display period. Restrooms at the RCF camp site will require wipe-downs of touched surfaces, too. Shifts for cleaning will be set-up to spread-out the burden of these important tasks.

To be mindful of social distancing, no alcohol will be served. However, BYOB if you wish.

Meeting Location

Our venue will be at the [Ravalli County Fairgrounds \(RCF\)](#) in Hamilton, Montana (map attached). Free on-site camping is at the north end of the Fairgrounds. This is a bare dirt and grass parking area with no shade or RV hookups. Alcohol can be consumed at camp sites.

Hamilton restaurants and hotels: <https://bitterrootchamber.com/hamilton/>

[If you click on the PLACES TO EAT AND STAY, you will be directed to a porn site. No joke. But, if you look at the dropdown menu and click on a community in the Bitterroot Valley, then you get a list of restaurants and lodging.]

The Bitterroot National Forest (BNF) has camping, and the USFS Website link below can provide information for those planning to camp:

<https://www.fs.usda.gov/detail/bitterroot/alerts-notice/?cid=fseprd716187>

Please contact the BNF to see whether the campgrounds will be affected by any COVID19 announcements. NPR had a recent expose on how public lands were being overwhelmed by people fleeing civilization and for some, trying out new RV's. A PDF of BNF campground amenities and map is attached.

Schedule and Logistics

A pre-meeting Thursday afternoon field trip to the Sleeping Child metamorphics will start south of Hamilton. The actual on-site **registration begins on Thursday evening at the Art building located on the Fairgrounds property**. The meeting format is informal and begins Friday morning with invited talks followed by several half-day afternoon field trips on Friday afternoon. Saturday and Sunday have all-day field trip options, and Monday will have a day-long post-conference field trip. An informal poster session will begin Thursday evening and posters will stay up through Saturday night. For further information or to help with the conference, contact George Furniss (comogeo@gmail.com), or Jeff Lonn (jlonn@mtech.edu).

For breakfasts, boxed food items will be offered (egg casserole, scone and fruit). The Mine Shaft, a local restaurant, will supply the breakfast boxes and coffee. TRGS participants who order breakfast can retrieve a box and sit outside/inside the Art building. Please supply your own coffee cup.

Bag lunches from the Mine Shaft will include a Butte-style fresh baked pasty (meat varies by day), a cookie and a piece of fruit. If you are a vegetarian, please check the box on the registration form for a pasty w/o meat.

A Feedback-style BBQ dinner Friday & Saturday evening can be purchased for one or both evenings. The dinners will be BYOB or other refreshments.

Transport to various field sites will be by small group/individual private vehicle. Popular trips may be restricted if roads are narrow or pullouts have limited space for vehicles (traffic safety).

2020 HAMILTON CONFERENCE SCHEDULE

Thursday, July 23, 2020

Pre-meeting field trip: Noon – 5 p.m. Mylonitic basement-Belt contact, Sleeping Child metamorphics. Jeff Lonn trip leader. Short, steep, and hot, off-trail hike to view a fault contact between the Belt and basement rocks. Meet/depart from Park & Ride lot at the intersection of US93 and MT38 (Skalkaho Pass Road) south of Hamilton ~2 mile. Turn left at the flashing yellow light onto MT38, and then immediately right into dirt parking lot (see map). Bring your own lunch and drinks. Vehicle parking at the trailhead is limited.

5 p.m. – 7 p.m.: On-site registration at the Ravalli County Fairgrounds; Art building. Posters can be mounted on display boards.

Friday, July 24, 2020

7 a.m.- 8 a.m.: On-site registration at the Ravalli County Fairgrounds; Art building. Posters can be mounted on display boards.

Breakfast options: On your own or box meal and coffee. 7 – 8 a.m.

8 a.m. – 9 a.m.: TRGS business meeting

9 a.m. – 11 a.m.: Technical presentations

At the end of the talks, lunches should be picked-up prior to field trip departures. **Unlike previous years, no water or pop will be available on the trips for Friday, Saturday or Sunday! Please bring your own drinks!**

Afternoon field trip options

- Trip A1: Stony Lake thrust fault/shear zone—Jeff Lonn—steep strenuous off-trail hike to view a kyanite-bearing shear zone in Belt rocks, lower Skalkaho region.
- Trip A2: Tertiary deposits high on the Bitterroot Mtn front—Mike Stickney—Drive to the Victor “V” hilltop with moderate walking to view Tertiary stream deposits faulted into place 1,500 feet above the valley floor.
- Trip A3: Crystal Mtn mine—Chris Gammons—long drive on gravel roads with 1 mile+ of hiking to look at the fluorite deposit.

BBQ Dinner starting @ 6 p.m. **BYOB**

Saturday, July 25, 2020

7 a.m. – 8 a.m. Breakfast on your own or pick-up pre-ordered breakfast box. Pick-up your lunch and fill your water bottles (**no hydration provided during the trips**).

8 a.m. – 6 p.m. Field Trips (These will depart from the Art bldg., RCF on Fairgrounds Road)

- Trip B1: Como Dam fault scarps—Mike Stickney—Drive and moderate hiking to view glacial moraines of several ages and Tertiary deposits offset by scarps of the late Quaternary Bitterroot fault.
- Trip B2: Sleeping Child metamorphic rocks—Jeff Lonn—All day, strenuous hike crossing high-grade Belt and basement rocks of the Sleeping Child Creek area, ending at the Stony Lake thrust fault. (Somewhat limited vehicle parking at trailhead.)
- Trip B3: Lower Willow Creek porphyry deposit —John Childs—All day trip to view mineralization west of the Black Pine Mine near Philipsburg.

BBQ Dinner starting @ 6 p.m. **BYOB**

Sunday, July 26, 2020

7 a.m. – 8 a.m. Breakfast on your own or pick-up pre-ordered breakfast box. Pick-up your lunch and fill your water bottles (**no hydration provided during the trips**).

8 a.m. – 6 p.m. Field Trips (These will depart from the Art bldg., RCF on Fairgrounds Road)

- Trip C1: Late Quaternary fault scarps along the Bitterroot front—Jeff Lonn—All day moderate 8-mile hiking trip in the Bitterroot foothills to view fault scarps and Eocene to late Quaternary geology. (Maximum # = 20)
- Trip C2: Hamilton to Lake Como geology—George Furniss—all day driving trip to view Tertiary and Quaternary geology along the Bitterroot front.
- Trip C3: Faulting and Flooding in the Missoula Valley—Jim Sears—Leaves from UM campus and ends with a 2 mile walk on trails in the North Hills.

6 p.m. – 8 p.m. Dinner on your own.

Monday, July 27, 2020

7 a.m. – 8 a.m. Breakfast on your own

Post-meeting field trip: Skalkaho to Rock Creek—Bruce Cox—All day driving trip to look at the Precambrian through Tertiary geology along the Skalkaho Pass road, ending at the Rock Creek sapphire deposits.

Direct questions about the field conference or accommodations to George Furniss (comogeo@gmail.com). Additional conference information may be posted on the TRGS webpage (<http://trgs.org>) or the TRGS Facebook page. Contact Sandy Underwood (SandyUnderwood903@hotmail.com) if you are interested in helping out at the conference.

REGISTRATION

REGISTER BY MAIL: Complete the enclosed registration form and pay by check (**postmark by July 6**). Send to: Tobacco Root Geological Society, P.O. Box 118, Butte, Montana 59703-0118.

*****OR*****

REGISTER ONLINE*: Online registration opens on June 13th at trgs.org. After registration opens, complete the [online registration form](#)* and send a check for registration fees to Tobacco Root Geological Society, P.O. Box 118, Butte, Montana 59703-0118 **OR** pay by Paypal. Please be sure to print your completed registration form before you submit your responses. Please complete the online registration form **no later than July 13**.

***Preferred method of registration for accurate attendee contact information, trip registration, and meal selection**

Registration deadlines are in place to secure lunches for the field trips and food for the catered meals. Meals cannot be guaranteed if registration forms are not submitted by the deadlines. We thank you for your assistance with this!

All field trip participants, including leaders, must register for the conference. Field trip leaders do not need to pay for the field trip(s) they are leading. Field trip registration includes a lunch. Please note that there are two places on the form where you can contribute to the scholarship fund of the TRGS – by purchasing a conference T-shirt or by making a direct contribution to scholarships.

MAIL-IN CONFERENCE REGISTRATION FORM

Please send form with check made out to Tobacco Root Geological Society to:

Tobacco Root Geological Society, P.O. Box 118, Butte, Montana 59703-0118

Attendee Name: _____

Attendee Address: _____

Phone: (____) _____

Email: _____

Number Amount Paid

Conference Registration		
1. Professional \$ 50		\$
2. Student \$ 30		
Meals		
Breakfast Boxed Friday Morning \$8.00		\$
Breakfast Boxed Saturday Morning \$8.00		\$
Breakfast Boxed Sunday Morning \$8.00		\$
BBQ Boxed Dinner Friday Night \$15.00		\$
BBQ Boxed Dinner Saturday Night \$15.00		\$
FIELD TRIPS: \$15/trip, includes a sack lunch; <i>bring your own drinks.</i> Vegetarian lunch? Y <input type="checkbox"/> N <input type="checkbox"/>		
ONE TRIP PER DAY MAXIMUM (A-Friday, B-Saturday, C-Sunday trips)		
Trip A1: Stony Lake thrust fault/shear zone hike (Lonn)		\$
Trip A2: Bitterroot Mtn front walk (Stickney)		\$
Trip A3: Crystal Mine (Gammons)		\$
Trip B1: Como Dam fault scarps (Stickney)		\$
Trip B2: Sleeping Child metamorphic rocks (Lonn)		\$
Trip B3: Lower Willow Creek porphyry deposit (Childs)		\$
Trip C1: Bitterroot front Late Quaternary fault scarps (Lonn) MAX 20		\$
Trip C2: Hamilton to Lake Como geology (Furniss)		\$
Trip C3: Faulting and flooding in the Missoula Valley (Sears)		\$
Field Conference T-shirt , please specify number and size, \$15/each		\$

TOTAL CONFERENCE FEES \$ _____

DONATIONS (Optional)

Complete this portion of the registration form if you wish to MAKE A DONATION to the TRGS Scholarship fund. PLEASE SPECIFY ALLOCATION(S) BELOW.

TRGS Scholarship for field-based projects in the northern Rocky Mountains. Preference given to mapping projects in Montana, Idaho, and northern Wyoming. Based in part on need, the scholarship is expected to be used for field expenses.	\$
Please indicate: to grow the TRGS endowment _____ OR to spendable funds _____	
Harrison Scholarship In memory of Jack Harrison and made possible by a generous endowment from Jack to the TRGS, awards go to students working on any project involving Precambrian rocks. Based in part on need, this award can only be used for field expenses.	\$
Please indicate: to grow the Harrison endowment _____ OR to spendable funds _____	
Foster Scholarship (This is not an endowment, all contributions are spendable) Given in memory of Michael Thompson Foster, to students, researchers, or explorationists who best exemplify the prospector ethic. Criteria are a demonstrated interest and ability in mineral exploration, field research, or economic pursuits which advance our knowledge of mineral commodities and public commitment to responsible mining. Supported by generous grants from Rob Foster and additional donations.	\$
M. Dean Kleinkopf Scholarship (This is not an endowment, all contributions are spendable) Given in memory of Dean Kleinkopf, for geophysical and geologic investigations in the northern Rocky Mountains. Supported by an initial grant from Nancy Kleinkopf and additional donations.	\$
The Betty Skipp Research Award for Field Studies in the Rocky Mountains (This is not an endowment, all contributions are spendable) Given in honor of Betty Skipp, to women M. S. or Ph. D. students for research with a significant component of original geological fieldwork in Idaho, Montana, Utah, Colorado, or Wyoming. If funds are sufficient, men may also be supported.	\$
Unrestricted	\$

TOTAL DONATION \$ _____

TOTAL AMOUNT ENCLOSED (Conference + Donation) \$ _____

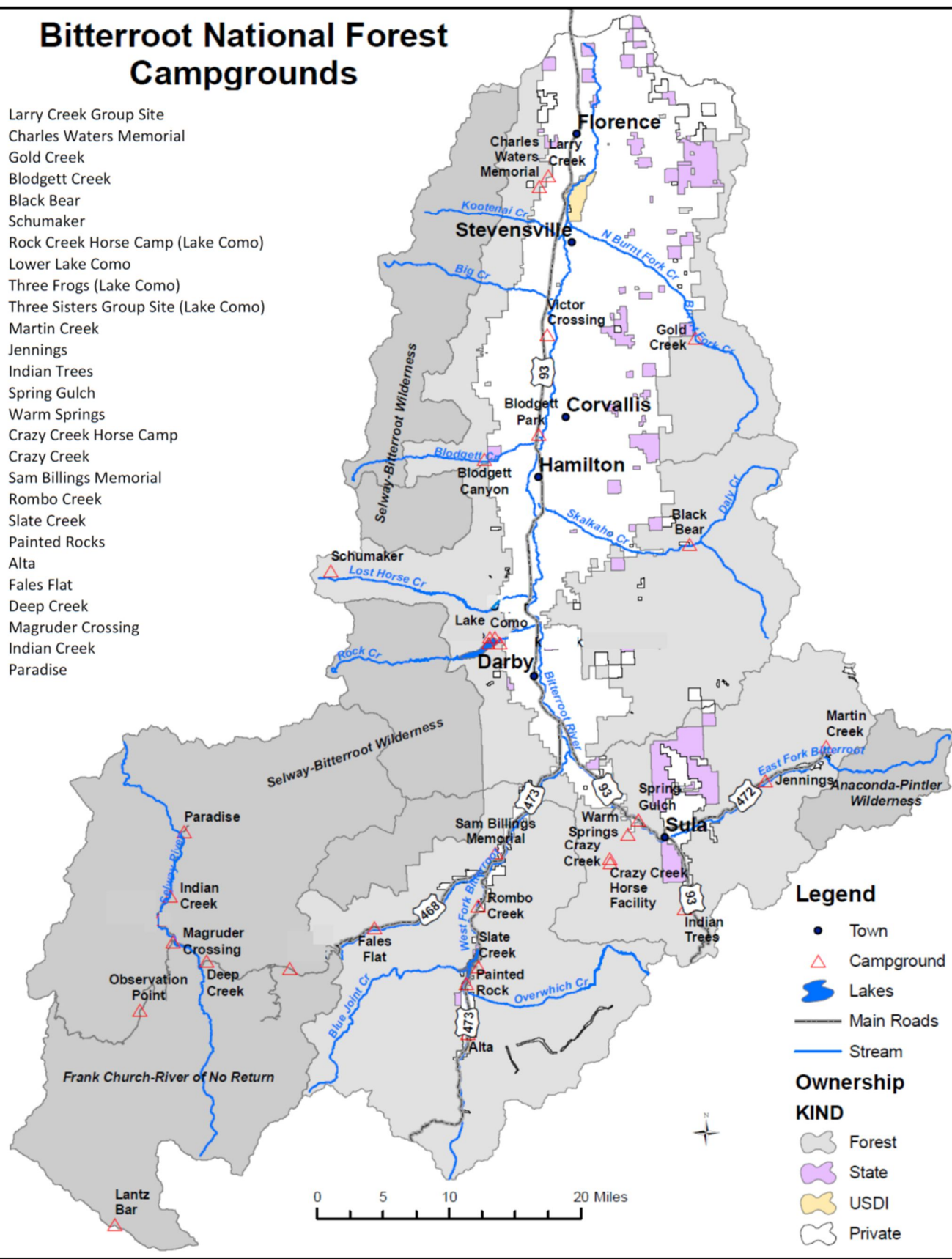
**** Please submit payment by check with this registration form ****

Hamilton Area Maps and Fairground layout:



Bitterroot National Forest Campgrounds

Larry Creek Group Site
 Charles Waters Memorial
 Gold Creek
 Blodgett Creek
 Black Bear
 Schumaker
 Rock Creek Horse Camp (Lake Como)
 Lower Lake Como
 Three Frogs (Lake Como)
 Three Sisters Group Site (Lake Como)
 Martin Creek
 Jennings
 Indian Trees
 Spring Gulch
 Warm Springs
 Crazy Creek Horse Camp
 Crazy Creek
 Sam Billings Memorial
 Rombo Creek
 Slate Creek
 Painted Rocks
 Alta
 Fales Flat
 Deep Creek
 Magruder Crossing
 Indian Creek
 Paradise



Legend

- Town
- △ Campground
- 🟦 Lakes
- Main Roads
- Stream

Ownership

KIND

- 🟤 Forest
- 🟪 State
- 🟨 USDI
- 🟩 Private



Recreation Site	# of sites	Max. Vehicle Length	Pull Thru	Water and/or Power	Toilet	Boat Ramp/Dock	Beach	Fishing Access	Wheel chair Access	Camp Host	Dates Avail.	Fees & Info	Ranger District
Charles Water Campground	28	70'	Y	W	X				X	X	5/1-11/1	\$10-Summer	Stevensville (406) 777-5461
Larry Creek Group Site	1	N/A	Y	W	X				X		5/1-9/30	\$30- NRRS**	
Gold Creek Campground	5	30'	N		X			X			YR/CBS	Pack In/Out ^Δ	
Willoughby Environmental Center	Day	N/A	N		X						YR	Day Use Only	
Blodgett Creek Campground	7	45'	N	W	X			X	X	X	YR/CBS	Pack In/Out	Darby (406) 821-3913 <i>*Available by reservation – call Darby Ranger Station</i>
Black Bear Campground	6	50'	N		X			X			YR/CBS	Pack In/Out	
Schumaker Campground	16	55'	Y		X			X	X		YR/CBS	Pack In/Out	
Rock Creek Horse Camp (Como)	11	40'	Y		X	X	X	X	X		YR/CBS	\$8-Summer	
Lower Lake Como Campground	11	70'	Y	W,P	X	X	X	X	X	X	5/25-9/30	\$16-WP	
Three Sisters Group Site (Como)	1	70'	Y		X	X	X	X	X		5/25-9/30	\$25-min *	
Three Frogs Campground (Como)	20	30'	N	W	X	X	X	X	X	X	5/25-9/30	\$8-Summer	Sula (406) 821-3201
Lake Como Day Use		N/A	N	W	X	X	X	X	X		5/25-9/3	\$5 Vehicle	
Martin Creek Campground	7	30'	N	W	X						YR/CBS	\$8-Summer	
Jennings Camp	4	20'	N		X			X			YR/CBS	Pack In/Out	
Indian Trees Campground	16	50'	Y	W	X				X	X	5/20-9/30	\$10, NRRS**	West Fork (406) 821-3269
Spring Gulch Campground	10	50'	Y	W	X			X	X	X	5/20-9/30	\$12, NRRS**	
Warm Springs Campground	14	26'	N	W	X						5/20-9/30	\$8, NRRS**	
Crazy Creek Horse Camp	5	26'	N		X						YR/CBS	Pack In/Out	
Crazy Creek Campground	7	26'	N	W	X						YR/CBS	\$8-Summer	West Fork (406) 821-3269
Sam Billings Memorial Campground	12	30'	N		X						YR/CBS	Pack In/Out	
Rombo Campground	15	42'	N	W	X			X		X	5/20-10/15	\$8, NRRS**	
Little Boulder Bay Boat Launch		N/A			X	X					YR/CBS	Day Use Only	
Slate Creek Campground	12	30'	N		X					X	YR/CBS	Pack In/Out	
Painted Rocks Campground	...	...	...	...	X	X	...	...	...	...	(406) 273-4253	STATE
Alta Campground	15	42'	N	W	X			X		X	YR/CBS	\$8, NRRS**	
Fales Flat --- Group	1	N/A	N		X			X			YR/CBS	\$15, NRRS**	
Fales Flat	3	N/A	N		X			X			YR/CBS	Pack in/Out	
Deep Creek Campground	6	25'	N		X			X			YR/CBS	Pack In/Out	
Magruder Crossing Campground	4	25'	N		X			X			YR/CBS	Pack In/Out	
Indian Creek Campground	6	25'	N		X			X			YR/CBS	Pack In/Out	
Paradise Campground	5	25'	N		X			X			YR/CBS	Pack In/Out	

^Δ Not recommended for trailers, ** NRRS - see definition below, YR - Year round, CBS - Closed by Snow, WP- Water/Power
Some sites available through National Recreation Reservation System (NRRS) www.recreation.gov TOLL FREE 1-877-444-6777, TDD 1-877-833-6777