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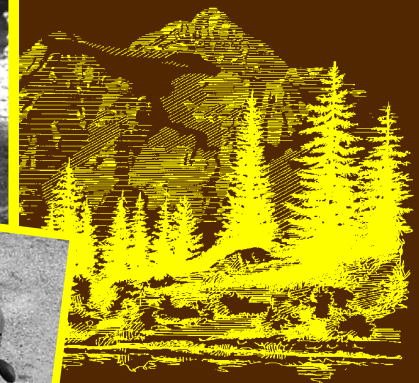
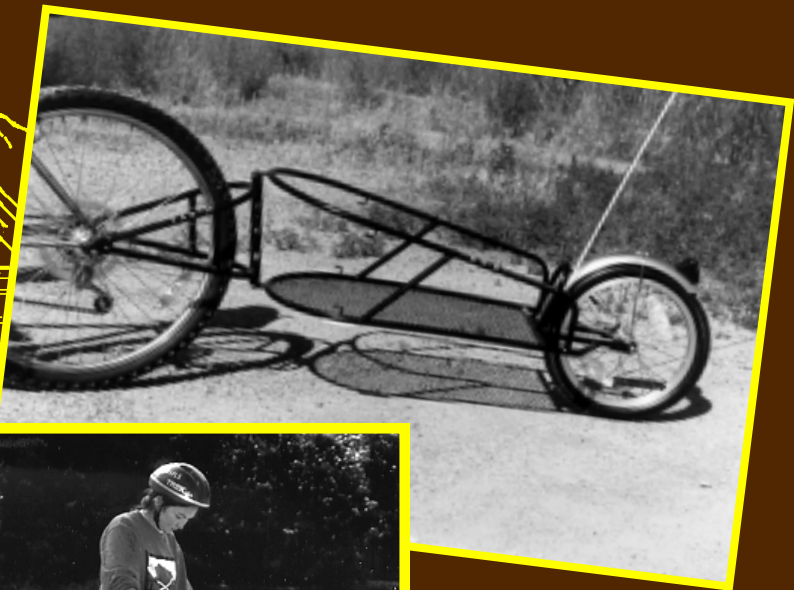
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# Mountain Bike Accessories for Trail Work



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7E72A47—Accessories for Transporting  
Trail Maintenance Tools

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## Introduction

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**M**ountain bikes. You find them on nonwilderness trails everywhere. Continual improvements in bicycle suspensions, brakes, structural materials, and other key components allow mountain bikers to travel faster, farther, and with greater ease and dependability than ever before.

It should come as no surprise that mountain bike enthusiasts who also maintain trails have seen the benefits of using mountain bikes for trail work. This case study shows how the Seward Ranger District on the Chugach National Forest uses mountain bikes. In addition, it describes how the Missoula Technology and Development Center (MTDC) worked with the District trail crew to develop a bicycle-mounted chain saw carrier and evaluate several single-wheeled bicycle cargo trailers.



## The Situation at Seward

Set in the beautiful and mountainous Kenai Peninsula south of Anchorage, Alaska, the Seward Ranger District has a short summer season, high visitation, and a shrinking trail maintenance budget.

In her project proposal to MTDC, District Trails Coordinator Irene Lindquist (Figure 1) provided some details about the trail program:

*“The Seward Ranger District has a spruce bark beetle infestation which*

*has been spreading for the past several years. Each year, more dead trees are falling across the trails. Removing 2,000 trees with diameters averaging 15 to 24 inches is beginning to be the norm.*

*We are not located in a wilderness and the preferred method for trail employees to remove fallen trees is with a chain saw, adding to the weight of standard camping equipment. Heavy backpack loads combined with continuous mounting and unmounting of the pack and walking several miles cutting trees is physically and mentally exhausting.*

*We have been experimenting with mountain bike travel for early season tree removal*

*and have noted an incredible savings of time by 50% over backpacking. We have found mountain bike travel to be fast and easier on the body and mind than hiking with the gear and equipment in the proper situation. For the trails and circumstances where mountain bike travel is appropriate, we believe a good system with specially designed equipment is worth investigating.*

*Currently we mount a chain saw in a scabbard on the rear rack. Our front rack holds a set of panniers. A second traveler on mountain bike usually has panniers on front and back for the gas/oil and ax. We are trying new and more advanced designs of mountain bikes for the 1995 season. We have not come up with any new designs for carrying a chain*

*saw, gas/oil, and ax. We would like to design a bike and accessories capable of holding a chain saw (size similar to a Stihl 036 with a 20-inch bar) and 1.5 gallons gas, 2 quarts oil, wedges, ax, safety and first aid equipment, and personal gear for the day.”*

At MTDC’s suggestion, the Seward trail crew also agreed to evaluate single-wheeled cargo trailers.



Figure 1—Irene Lindquist and Stephen Hmurciak (right) were principal evaluators for this project.

## Benefits of Bicycles

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**W**e don't want to turn trail maintenance into another Extreme Sport. Picture it. Barely-in-control cyclists careening down mountain trails, chain saws in tow, grinning fiendishly as hikers scatter like terrified sheep at their approach.

To the contrary, we want to show you how members of one trail crew found that using mountain bikes for logging out some pretty tough trails allowed them to double their production without taking extraordinary risks.

The Seward trail crew has used mountain bikes since about 1989, but has increased the use of bikes markedly during the past 4 years. Currently, the District fields three, two-person bike teams to log out trails at the beginning of the summer season.

Irene Lindquist reports: *“Our number one savings utilizing mountain bike travel has been time. Running a close second is a lack of wear and tear on the employees' backs, knees, and feet.*

*The savings of time not only benefits the Forest Service by allowing time saved to be used on bridge and tread mainte-*

*nance, it allows the recreating public to experience a less frustrating hike, bike, or horseback ride on our trails.”*

Mountain bikes improve dramatically every year. In 1997, the District had six bikes:

- Two Novara Arribas without shocks, purchased in 1990
- Two Trek 970's with front shocks, purchased in 1994
- Two Specialized Rock Hoppers with front shocks, purchased in 1995.

Front shocks are a prerequisite for any new bicycles purchased.

The Seward District's mountain bikes are used hard and require constant maintenance and repair. Brake pads, in particular, need to be replaced weekly, or even more often when bike trailers are used. The District expects to spend about \$150 in parts for each bike per year, not counting the labor to install the parts.

The Seward trail crew is experienced. Crews use loaded mountain bikes on single-track trails considered moderate to difficult for ordinary mountain biking. Their use as described in this report represents difficult conditions and heavy wear. The scabbard and trailers described in this report make more sense and would be safer on easier trails.

On the Seward Ranger District, mountain bikes work best for logging out trails early in the summer. A two-person crew typically can log out 8 miles (12.8 km) in a 12-hour day. Crews have logged out as much as 11 miles (17.6 km) of trail in a single day. This is about twice as much trail as a hiking crew can log out in a day. Being able to return to the trailhead fairly quickly often eliminates the need for camping out. That means crews don't have to carry camping gear and food in addition to their equipment.

Mountain bikes have also proven invaluable for trail contract inspection. Irene Lindquist rode 20 miles (32 km) to check a contractor, then rode out, all in a single day. Hiking 40 miles (64 km) would have taken her 3 days.

## Not for Everyone

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**R**iding a mountain bicycle on any trail takes considerable skill. The rider needs to be in good physical condition. Controlling a heavily loaded bike on rough mountain trails requires much more—exceptional skill, endurance, strength, and experience. Make sure your crew has plenty of experience riding mountain bikes before loading one up with a chain saw or attaching a trailer.

Look at your own situation carefully before committing to a bike-mounted trail crew. This is not an easy decision. The easier the trail, the more mountain bikes make sense. Mountain bikes and other mechanical devices are not permitted in designated wilderness.

In Appendix A, we've enclosed two job hazard analyses prepared by the Seward Ranger District, one for using the mountain bikes and the other for using mountain bike trailers. Tailor your analyses to the local conditions and hazards—you might have cactus to contend with instead of bears.

## Panniers

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Irene Lindquist also wanted MTDC to investigate panniers that would hold 10 to 15 pounds of equipment: “We have tried several good-quality panniers and have had problems with the attachment system keeping the panniers on the bike racks. Because we are riding on trails which are not always smooth and have lots of bumps, our panniers have bounced free from the racks, and have blown seams.”

MTDC chose not to evaluate panniers because so many good ones are available. Basically, you get what you pay for with panniers. Generally, the most expensive bags are the strongest. Pay particular attention to the weight of the fabric, quality of stitching, and reinforcement. PVC-coated fabrics look especially strong and weather resistant. Bags with some sort of lock-

ing clip or clasp instead of open clips prevent the panniers from bouncing off the racks.

Quality retail and catalog suppliers carry a good selection of panniers that should meet your needs.

## Chain Saw Carrier

Missoula smokejumper Keith Wolf-erman designed and fabricated the simple, yet effective chain saw carrier that MTDC sent to Alaska for testing (Figure 2). He built it to fit a Stihl 036 with 20-inch (508-mm) bar, a fairly large saw. If you decide you want some of these, build them to fit the saws you will be carrying. We do not recommend carrying saws larger than the one we tested. The smaller the saw, the easier it will be to transport.

The rack is simple. Three layers of  $\frac{1}{2}$ -inch (12.7-mm), closed-cell foam were glued together with spray adhesive and topped by a  $\frac{1}{16}$ -inch (1.6-mm) sheet of aluminum. The rack fits snugly on top of the bike rack as a cushion for the saw's power head (Figure 3).

The side scabbard was fabricated from two pieces of inexpensive, high-density  $\frac{1}{8}$ -inch (3.2-mm) polyethylene plastic, with a  $\frac{3}{8}$ -inch (9.5-mm) spacer between the pieces. The Seward trail crew found that the saw teeth chewed through the soft polyethylene, and they recommended that the inside of the top of the scabbard be lined with  $\frac{1}{16}$ -inch (1.6-mm) aluminum, folded back over the top of the scabbard. Perhaps the teeth could be shielded from direct contact with the polyethylene by a tight-fitting rubber or plastic guard that could be slipped over the teeth before the bar was placed in the scabbard. We don't have all the details yet on the best fix for this problem.

We selected the heavy-duty Blackburn Expedition EX-1+ rear cargo rack as a mount for the chain saw scabbard. We also tried the heavy-duty Burley Moose Rack, available from that

company's dealers on special order. Both worked equally well. The Seward trail crew also used the carrier with the less expensive Blackburn Mountaineering rack. It worked fine, too.

We designed our prototype to be permanently mounted to the rack (Figure 4). This was a mistake, because the trail crew sometimes needed to remove the chain saw carrier without taking the rack off. All the fasteners on the cargo rack had been treated with Loctite to keep them from loosening. Future versions of the chain saw carrier need to feature bendable hook attachments rather

than solid loop attachments to hold both the power head cushion and side scabbard to the cargo rack.

So long as the saw was nearly all that was being carried, it could be carried safely, despite its high center of gravity and its weight on the back of the bike (Figure 5).

The bike's front shocks limit the ability to carry offsetting weight up front. Front cargo racks and shocks are not compatible. A second bike is needed to transport safety gear like chain saw chaps, first aid kit, gas, oil, personal protective equipment, saw kit, radio, bike tool kit, ax, water filter, personal gear, water, and food. Each bike carries at least 30 pounds (13.5 kg). Needless to say, use the smallest saw that will meet your needs.

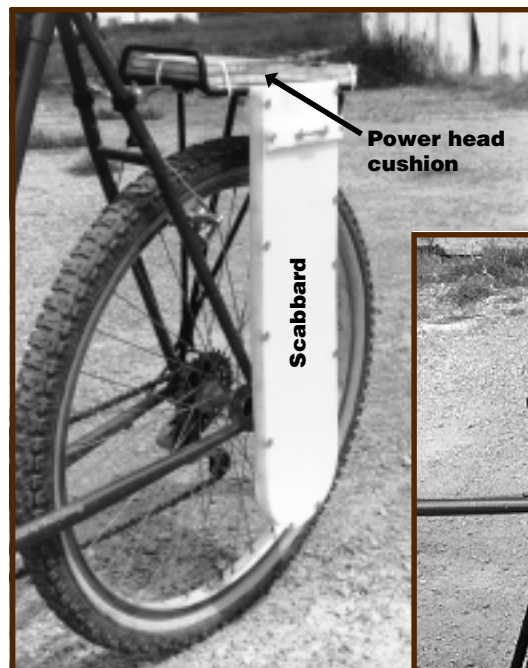


Figure 2—MTDC's prototype chain saw carrier consists of a power head cushion and side scabbard.



Figure 3—The power head cushion topped with sheet aluminum needs to be high enough so that the saw dogs clear the side scabbard. The height will vary with different brands of saws.



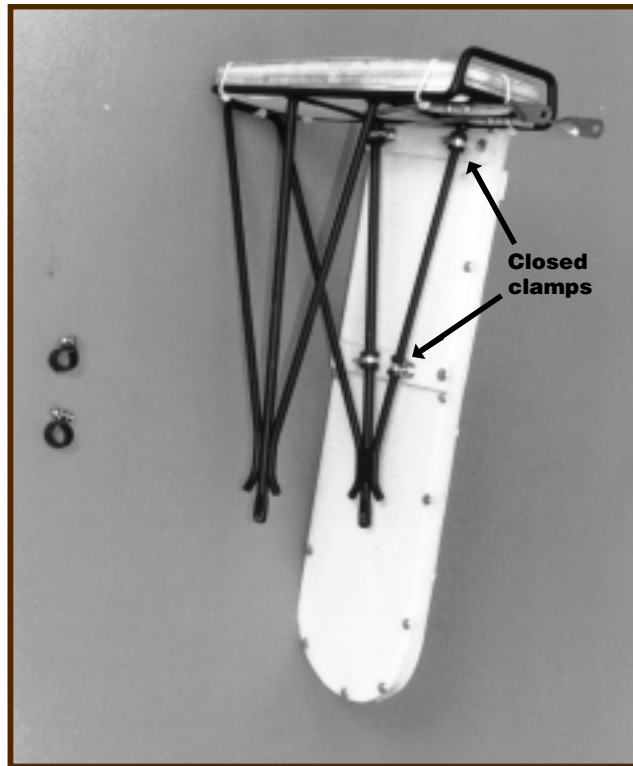


Figure 4—We should have used clips rather than the closed clamps shown so the chain saw carrier could be removed easily.



Figure 5—Two bikes, one for the saw and one for gear, are needed to outfit a crew. Handlebar bags on the front help to balance weight in the rear.