Kansas Trails Council

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Mechanized Trail Building *Lite*

[By Bob Nicholson]

Abstract*: When you have flagged a new trail route that can be safely ridden on an ATV and riding mower, that's all you need to build a new trail without hand tools. A 12-v sprayer for the ATV is also needed. The article explains the typical environmental circumstances needed to deploy this technique. It is ideal for sunny grassland sites, which may also contain scattered trees and/or shrubs. This approach uses equipment typically intended for trail maintenance rather than construction. Add advanced planning and careful timing and you can create a new section of single track in a very short time.*

Environmental Settings

Paved or natural surface, most all trails are built on sites that are either natural or naturalized. That could actually be anything from an historically pristine environment such as Colorado's Collegiate Peaks Wilderness (see website at www.trails.com/tcatalog_trail.aspx?trailid=HGR105-023), to a reclaimed phosphate strip mine in Florida (www.swampclub.org/alafia.php). Natural surface trails are built in about every kind of regional vegetation type (aka, biome) from the arctic tundra to tropical rain forest. In the US, trails are built in desert, grassland, forest, and occasionally alpine tundra. Depending on biome type, trail building techniques vary somewhat, with desert and grassland techniques tending to be quite similar. Of course if you are faced with doing it by hand, then it's going to be a lot of work about anywhere.

Intrinsic Site Features: What are the site features that affect where we route and how we build new trails? The answer: topography, substrate, and vegetation. Learning how is the focus of this article; choosing a route is a different subject for another time.

In general, trail building in forest is more complex (duh, there's those pesky trees) and requires some different tools depending on whether it's a rain forest or a drier type of forest such as deciduous or coniferous. In terms of relevant differences between biome types, it's mainly the vegetation.

[Continued on Page 2]

Seasons Greetings

As you will see in this issue's Trail Reports, it has been a busy year at the KTC! Improving existing trails is an ongoing project for our members, trail coordinators and the local volunteers they recruit. We continue to build new trail sections on many of our trails. We hope you have noticed the effort of all these volunteers as you enjoy the beautiful trails in Kansas.

As the year draws to an end, we at the KTC wish you *seasons greetings* and hope that you enjoy the holidays with family and friends. We also hope that you will continue to support the development and maintenance of trails in Kansas by renewing your membership in the KTC. We are an entirely volunteer organization dedicated solely to promoting trail development. With your continued help, we will have another busy year in 2011!

2010 Outdoors Summit

The fourth annual Built Environment and the Outdoors Summit was held at the Wichita Marriott Hotel, October 19 and 20 with about 180 people in attendance. On the first day of the Summit, KTC President, Bob Nicholson, presented a Trail Building 101 session for single track trail development. Jeff Bender, Kaw River State Park manager, described the process of building urban gravel surface trails like the trail currently under construction at KRSP in Topeka. Ross Greathouse from Nebraska discussed the development of Rail Trails in the surrounding states.

On Day 2 of the conference, Bob Nicholson, Mike Goodwin and Jeff Bender conducted a guided hike of a local Wichita single track trail to show examples of good trail design and discuss how to address problems caused by poor design or trail usage.

Inside This Issue

Trail Building

Vegetation in desert is usually various species of brush, such as sagebrush and annuals. In forest it is often both brush and trees, but sometimes also perennial grasses and forbs (a botanical term referring to a non-woody, non-grass type of plant). Mostly we know forbs as wildflowers such as Maximillian's Sunflower or weeds such as dandelion.

Grassland vegetation is usually dominated by a cover of perennial grasses, but normally also various amounts of forbs, and sometimes shrubs and/or trees. In Kansas, all trail systems have a combination of herbaceous and woody plants. For example the Ford County Lake Mountain Bike Trail is about half forest and half grassland; whereas the Perry Lake Mountain Bike Trail is mostly an oak forest. The Switchgrass Mountain Bike Trail is (duh) mostly grass, but with a complement of bushes and trees (see photo).

Wilson Lake Switchgrass Mountain Bike Trail

Intrinsic Properties Affect Trail Design: The focus here is primarily vegetation, but not exclusively. This technique is infeasible on excessively steep slopes and/or very rocky sites. These powerful machines are simply not safely operated on terrain that is too steep. Trees and bushes provide both positive and negative impacts on trail design. Some are obstacles and have to be removed, whereas most can be used to define route features in the trail.

A positive can sometimes become a negative with plant growth to the point of interfering with trail use, and eventually becoming a maintenance task. It might or might not be easier to build around the object than to remove it. Trails benefit from obstacles that naturally increase tortuosity of the route, as long as it is not overdone (too tight). Without such objects, the main trail building environmental factors become one less: just topography and substrate.

Mechanized Approaches

Classical: The development of mechanized trail building has mostly been focused on contour bench cutting, the process of creating a mini-terrace traversing the hillside to remove vegetation and provide a more level perch for the trail tread. This generally requires moving a fairly large amount of substrate, even if little or no bench cutting is required, which is often the case. This is a major point and will visit it again below. There are lots of other important uses of power equipments such as moving earth, rocks or sand from one place to another.

The sine qua non of trail construction equipment is the Sweco Trail Dozer, which costs around $65,000. Less robust and costly, but more versatile would be the Ditch Witch SK650. Mini-excavators, such as Terex TC20, can move lots of earth, and cost a bundle too. These machines are primarily owned by pro trail builders and not readily accessible to the average volunteer. Alternatively, mowers and ATVs are generally available and less costly because they are normally deployed for trail maintenance.

In reality, every trail has at least some sections where the soil surface does not need to be disturbed, if the vegetation can be otherwise removed. Regardless of the extent of trail involved, this process is far faster and easier to put down a trail ready for use. It does, however, require a substrate relatively free of large rocks and stumps.

Mow/Spray/Buff Method: This approach is a three phase mechanized process, the first two of which were developed by my friend and fellow KTC'r, Doug Palen.

- Mow – 4-6' corridor, normal height cut. I use 5' and 3". This just reduces the mass of plant material.
- Spray – 16-24"; I spray 20". This is to kill the plants only on the tread. Timing is critical.
- Buff – 16-22"; I use 18". This step is to remove all aboveground plant material from the tread.

Mow: I use a 25-hp, zero turn riding mower, with a 5' deck. For trail mowing it is important to be able to control deck height by a foot pedal. This mower will handle about any height of grass and a surprising amount of brush – basically anything up to about 1.5" diameter. I start at the highest setting and make progressively lower passes to normal mowing height of about 3". I do not recommend to scalp with the mower as this practice will encourage the growth of annual weeds. The next step can be either spray or buff. If it's early in the growing season, I spray first. If it's

later in the growing season I will buff, wait for regrowth, then spray.

Spray: Timing is one of the most critical issues in effective herbicide use. Apply the correct amount at the correct time. From a single nozzle mounted to the hitch of an ATV, I apply a 20" swath more or less to the center of the 5' mowed swath. The spray unit has a 20-gal capacity and is powered by a 12-v pump. I apply a 2:1 mixture of glyphosate and 2,4-D, at recommended rates. This step is not complete until the vegetation has been effectively killed by the herbicide. That is probably sometime before the plants show mortal symptoms, but that's a hard thing to detect.

Buff: This phase is similar to using a power de-thatcher, but on the riding mower. The mower has 3, 21" blades, which are removed. The right hand blade is replaced with a shop-built heavy duty buffing rotor constructed from a discarded mower blade (see photo). The mower is driven such that the rotor strips all above ground plant material at or slightly below ground level in the sprayed swath. Uneveness in the trail is smoothed also. Small rocks and small woody roots can be handled as well, but lift the mower deck for larger roots and stumps of about any size.

After 2 Weeks

Limitations and Alternatives

Out slope of the tread is an important issue regarding trail construction (≥ 5%) and this technique will work only on side slopes suitable for safe use of the mower and ATV. Thus I spend a lot of time planning routes that can be done or mostly done mechanically. That has important implications also for the amount of time spent in maintenance in the future. There has to be some trade off regarding technical features of the trail vs. mechanized building lite plus mechanized maintenance.

After 4 weeks

Steep and Rocky Sites: What to do in those areas where the riding equipment can't go? If there is vegetation to be removed, I apply herbicide by hand with a 5-gal backpack sprayer, using the same 20" swath if it's grass. If it's shrubs, I apply a 4-6' swath. Waiting until the vegetation is mostly dead, it is much easier to remove. For brush removal, I mainly use a string trimmer with a steel brush blade. It will handle most species up to about 1.5". It is important to clear at least a 4' corridor to reduce future maintenance. For grasses, I use a string trimmer. Effective first application of herbicide will definitely reduce future maintenance.

One major difference between forest and grassland is the amount of and type of routine maintenance. Because of shading in the forest, grasses are much less robust and often simply absent. But any location that has substantial exposure to sunlight will have ground story vegetation, either herbaceous or woody. Woody undergrowth in forest can often be a primary maintenance issue.

On the Switchgrass trail, a maintenance goal is exclusive use of herbicide, which is much more efficient and less labor intensive than trimming or mowing, applied either with the ATV or by hand depending on accessibility. I spray at about 8 mph – that cleans up a lot of tread in a short time. In reality, herbicide use greatly reduces but does not completely eliminate the need for mowing and trimming. Chemicals costs are minimal. I spray about 5 miles of trail to equal one acre.

Prescribed Burn: If possible, I'd replace Phase 1 with a prescribed burning of the entire vicinity of the new trail instead of mowing just the route. From previous experience, it is many times easier to establish a route. Furthermore, in grassland, fire is a natural part of the ecosystem function. And in many parks, fire has been absent for many years resulting in the invasion of unwanted woody species and the loss of the dominant perennial grasses. It's a big undertaking and in principle condoned by KDWP and ACOE. In practice it requires substantial equipment, an experienced crew, and perfect logistics to safely and effectively pull it off.

Trail Reports

Clinton Lake – North Shore Trails

The Quickcrete armoring on the blue trail that was installed last summer is working well. Although a little deluge or some winter snow will be the ultimate test.

In November, we rerouted a flat trail section on the blue trail at Mile 3.2 to address chronic mud problems. The new trail is properly outsloped (about 3%) and has many grade reversals as it winds through some mature cedars. Our local crew was joined by a scout group from Baldwin so we finished the project in record time.

Mud Creek Armoring

We also rebuilt the armored crossing on the blue trail at Mud Creek in October (see photo). Spring flooding moved the armoring around as large logs floated downstream. This section was under about five feet of water this summer.

Mike Goodwin (goodwinmw@cox.net)

Clinton Lake – George Latham Trail

We had a great turnout for the November workday on Thanksgiving weekend. Thanks to the fast work of volunteers from the Lawrence Trailhawks (running group), the Lawrence Mountain Bike Club and the Baldwin Scouts we got the entire trail lopped and trimmed in about 2 hours. Several sections of trail were mowed the following week to get the trail ready for winter hiking.

Mike Goodwin (goodwinmw@cox.net)

Elk River Hiking Trail

Winter is a wonderful time to hike the 15-mile long Elk River Trail. With its rugged terrain and beautiful views, the trail seems to be more scenic and enjoyable at this time of year. Cooler weather makes it easier to take longer hikes and there is very little wind chill along the protected trail. Snow on the ground makes the trail even more picturesque and worth the trip. Winter is also a great time to do some bushwacking off the trail a ways to find hidden scenic views or rock ledges and outcrops to climb on that you might miss with more vegetation. When it gets really cold you can even take your ice skates along and enjoy some of the frozen shallow sloughs.

The trail is currently in excellent condition and is well marked with blue blazes. Trail heads are available at either end and at various places in the middle. A map may be needed to locate the middle trail heads. Camping sites are located at several places along the trail, primarily at the trail heads. Because of the cooler temperatures, now is a great time of year to think about a hike or run of the entire trail. Seven hours is a very reasonable time to hike the trail for experienced hikers with day packs. Out and back trips are also a lot of fun and there are great places within a few miles of the trail heads. My favorite part of the trail is the two miles east of the Oak Ridge trail head. You may not believe you're in Kansas in this area.

Please sign the trail registers when you hike and let me know what you think or saw on your trip to the Elk River Trail.

Steve Siegele (steveshardware@twinmounds.com)

Fall River Lake Trails

I've had two work days so far this fall season at Fall River Lake on the Badger Creek Trail project. The first workday we worked to clear and lop side growth, move dead-fall and connect the out bound and return sections of the trail for a continuous loop. The second trip was to clear leaves and debris from the trail tread to prepare to blaze and mark the trail. I hope to get some riding and traffic on the trail soon and blazing and marking will help with following the route. The opening of firearms deer season delayed the trip to blaze and build some rock cairns, we'll be back out in a week or so to complete that project.

Terry Plenert (PPLENERT@aol.com)

Ford County Lake

The 10 plus miles of mountain bike trail at Ford County Lake is in excellent condition. With recent moisture, the tread has become smooth hard pack, which allows some very fast paced riding. We have recently bridged over a few huge downed cottonwood trees but still have maintained easy outs for less experienced riders, runners and nature walking. We are making minor improvements to the trail on a weekly basis and are now seeing more use throughout the week. As one of the local group of mountain bikers, we have been riding the trail two to three

times a week with lights and then always a big group ride Sunday at 2pm. Recently wildlife has been abundant to include, White Tail Deer, Owls, Turkeys, Possum and, of coarse Skunks. Please make plans to join us for a ride. You can reach me at jwentling@buyggautos.com for specific ride times. We are also on Facebook under Ford County Lake Trail.

John Wentling (jwentling@buyggautos.com)

Kaw River State Park (Topeka)

Work continues on the gravel trail with the completion of the first bridge (see below). Two more bridges are in progress with the gabion abutments completed.

The basic trail corridor has been completed and the rock base has been laid on about half of the trail. After the rest of the base is laid, the final layer of crushed limestone will be spread.

Rock is delivered using the CanyCom

Building this trail has required the use of many types of equipment including excavators, skid-steers and material carriers like the CanyCom dumper above.

Mike Goodwin (goodwinmw@cox.net)

Melvern Lake (Eisenhower State Park)

2010 has been a banner year for equestrian camping and activities at Eisenhower State Park. ESP was the chosen site for many competitive rides, training rides, benefit rides, and was visited by out-of-state campers and riders. Several clubs and individuals utilized Crooked Knee this year. Many riders say that Eisenhower State Park is now one of their favorite places to ride. New, larger trail maps will be put up on the kiosks this winter. Paul Pingleton graciously donated large culvert tubes to improve some of the water/mud crossings on the Crooked Knee trail. Work has been completed in some of those areas, so that riders can access the west side of the park without going thru the boggy/muddy areas. Hats off to Ranger Paul for his generosity and to the ESP staff for making the improvements.

Jim Thomas (thomasj@kansas.net)

Perry Lake Bike Trails

Overall the trail is in great shape. The only pressing issue is about a 100 foot section that should be re-routed after the high water episode earlier this year undercut the bank compromising the tread. Plans to do a re-route on Mad Mile and an extension of Wild West are being considered if volunteer interest is strong enough.

Lyle Riedy (lriedy@usd345.com)

Perry Lake Hiking Trails

It was almost the best of times. And almost the worst of times. A lot of good work got accomplished on Section 1, with some work getting done on sections 2 and 4 – but just not by design or planning. Under the lessons learned heading, consider the following: string trimmers cut lespedeza quite well, but they can't be pushed through the tangles; self-propelled DR mowers don't work when tires fall off or bearings burn out; highway bridge repair construction zones that create 30 mile detours do not enhance the ability to move equipment along the trail; and, rain does not improve paint blazes.

Before

Trail Reports

After

Overall, through five tries at mowing part of section 1, we managed to clear part of section 4 (should be reasonably open from Ferguson's trailhead to the section 1 junction), lop, trim, and blaze most of section 1, mow a short piece of section 2 to delineate its road crossing, and yes actually finish mowing the lespedeza.

Dave Brackey (dbrackey@tb-engr.com)

Tuttle Creek Trails

This is the time of year we start planning for the next trail years maintenance. Notes have been taken on which trees need to be trimmed or limbs removed. Places where the brush is overtaking the trail are put on the to do list. And the places where the sustained high water of the 2010 summer must be rebuilt. We have noted one place in particular where said water level has left us with a test to make it passable, however that work as already begun.

We have always found that building new trail is exciting but maintaining old trail is not. Irregardless, it must be done and there is a certain satisfaction seeing a nice open challenging trail ready to ride. A more detailed report will be prepared after the holiday for the Council, Corp of Engineers, and State Park officials.

Wishing everyone Happy Holidays and Clear Trails for 2010.

Olivia Huddleston (opieh@bluevalley.net)

Topeka Trails

Dornwood Trail

Dornwood is really looking good. The leaves are blown, the trails are clean and in good condition.

We have had a lot of trail use this fall, it has made for a nice hard pack for joggers, mountain bikers and hikers. If anyone has a chance, please visit this nice nature trail.

Russ Rupp (russ11@cox.net)

MacLennan Park (Cedar Crest) Trails

The trails are in great shape going into winter. We're planning to start construction of a log ride area using some large logs which were cut recently along the trail. The railroad needed to clear some trees in their right-of-way that might fall across the tracks in a wind storm. Their work provided a supply of quite large logs in almost the right spot.

A few of the small ones

We will begin work on this project after the holidays.

Mike Goodwin (goodwinmw@cox.net)

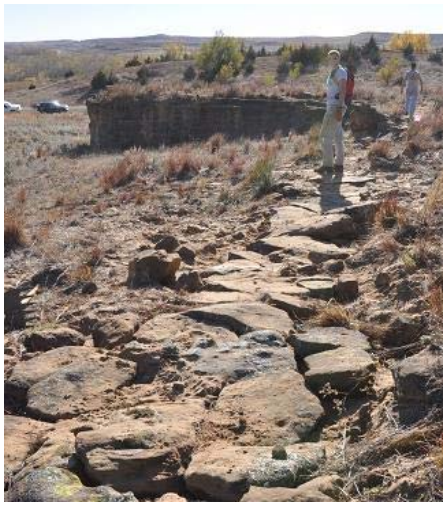
Wilson State Park Trails

The big event for this quarter was building a brand new section of trail in Wilson State Park. There were 14 volunteers that participated on a windy weekend of November 6-7, with 8 at work each day. We also had the help of the KTC's very own Ditch Witch SK650, aka, a diesel-powered dogsled with a front end loader. Before the big project I was able

to relocate some sizable rocks to the trail head for a little landscape enhancement.

The original impetus for this project was to eliminate an older section of trail that was on an erosion-prone fall line. Fortunately we lost only about 100 ft of old trail. Our biggest challenge on this section was sand, because there are not that many ways to deal with sand. One choice is to do nothing, which always makes for a challenging ride. Some riders like to ride in sand, but most think it's not so hot. The other choice is to armor. There are a number of choices for armoring materials, but fortunately for us there was a plentiful supply of natural sandstone pavers and cobbles. That is always great for the Park's environment, because we did not need to import any exotic material to the area.

Rock armoring is a very labor intensive effort and we spent the majority of the weekend working just a few sections of armor. But without the dogsled we'd still be out there. We ferried tons of rock – not far, but the reduction in hand labor was enormous. The final result is a maintenance-free, all-weather surface. Overall the new section added about ½ mile featuring lots of technical trail, some climbing, and a few short, fast drops. The new section was designed as a loop, thus we were able to devise a cutoff for those not wishing to ride the new stuff.



The HUB Bicycle Shop in Hays provided scrumptious lunches for both days. The Wilson State Park crew provided us with an outstanding chili supper Saturday evening. Thanks to all the contributions by everyone – the Switchgrass Trail just keeps getting better and better.

Bob Nicholson (rnicholson@fhsu.edu)

4th Quarter Board Meeting

Due schedule conflicts and no urgent business to address, the Board decided to forego the 4th Quarter meeting. The next meeting will be in the first quarter of 2011 at a time and place to be announced.

Board Members

Board Positions 1 – 6 (2010 & 2011)

1 - Chris Kaegi-Stephens - Valley Center

2 - Jim Thomas - Lyndon

3- Doug Palen - Glen Elder

4 - Olivia Huddleston - Vermillion

5 - Neil Taylor - Lawrence

6 - Susan Haynes, Secretary - Shawnee

Board Positions 7 – 12 (2009 & 2010)

7 - John Wentling - Dodge City

8 - John Haynes - Shawnee

9 - Lyle Riedy, Vice President - Topeka

10 - Michael Goodwin, Treasurer - Topeka

11 - Bob Nicholson, President - Hays

12 - Terry Plenert - Wichita

KTC KANSAS TRAILS COUNCIL

Kansas Trails Council
PO Box 695
Topeka, KS 66601-0695

Dave Brackey's Photo from Perry Hiking Trail

Supporting Kansas Trails

It's that time again to renew your membership in the KTC. Did you know that we maintain about 250 miles of trails in the state? We are able to do all this because of the generous support of our members who contribute their time and funds. We couldn't do all this without your support.

If you are not already a member, we hope you will join us in developing and maintaining trails in Kansas by becoming a member of the KTC. If you have a favorite trail you would like to support, we hope you will consider making a donation to the KTC Friends of the Trail program. Your tax deductible contribution will be used solely to support the trail(s) you select. The KTC is a non-profit, 501c3 organization. We appreciate your continued support of Kansas Trails!

KANSAS TRAILS COUNCIL MEMBERSHIP FORM - 2011

I would like to: Join ☐ Renew my Membership in ☐ the Kansas Trails Council for Calendar Year 2011

Name _____

Street _____City _____ State _____ Zip _____

Email: _____

NOTE: It is the KTC's policy that the above information will only be used internally by the KTC and will not be distributed to any other entity.
In the interest of conserving resources (time, postage, copying, etc.) and being more environmentally friendly, the KTC newsletter is primarily distributed by email. If you prefer to receive the newsletter by regular U.S. mail, please check the box on the right and your name will be added to the newsletter mailing list. ☐

MEMBERSHIP DUES

AMOUNT

Lifetime Membership: (One-time payment, no annual dues) ☐ $100.00

Annual Dues:

☐ Individual	$10	☐ Trails Supporter	$101 - $249	
☐ Family	$25	☐ Trails Patron	$250 - $499	
☐ Affiliate (groups, clubs, etc.)	$25	☐ KTC Sponsor	$500+	$_____

Optional "Friend of the Trail" Contribution

(any amount is appreciated) $_____

Please designate the trail(s) you would like to support with your Friend of the Trail donation.

- ☐ Clinton Lake - George Latham Trail
- ☐ Clinton Lake - North Shore Trail
- ☐ Elk City Lake - Eagle Rock Bike Trail
- ☐ Elk City Lake - Elk River Hiking Trail
- ☐ Elk City Lake - Table Mound Hiking Trail
- ☐ El Dorado Lake Trail
- ☐ Fall River Lake Trails
- ☐ Ford County State Lake Trails
- ☐ Melvern Lake - Ike's Trail
- ☐ Perry Lake Bike Trail
- ☐ Perry Lake Hiking Trail
- ☐ Tuttle Creek – Carnahan Trail
- ☐ Tuttle Creek – Randolph Trail
- ☐ Topeka – Dornwood Park Trail
- ☐ Topeka – MacLennan Park Trail
- ☐ Toronto Lake Trails
- ☐ Wilson Lake State Park Trails
- ☐ Melvern Lake - Crooked Knee Horse Trail

(Annual Dues + Friend of the Trail Contribution) **Total Amount Enclosed** $_____

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Website: www.kansastrailscouncil.org

12/2010