4 WHEEL MOUNTAIN BIKES

Guidance Notes
for Land Managers
and Trail Builders

ROUGH RIDERZ GUIDE

4 GOOD TRAILZ

MARCH 2009

Four wheel mountain bikes are used largely, but not exclusively, by disabled riders. They cater for persons of all ages with varying disabilities. In order to be able to control the bikes users need to have use of their arms and hands. The bikes are primarily designed to be gravity powered on downhill trails, however they can be self propelled on flat ground and very shallow gradients in the same way as a normal, manually propelled wheelchair. The bikes have no gears or drive train so propulsion is achieved by riders pushing directly on the rear wheels. Four wheel bikes can therefore be used on a variety of different types of trail including;

- Downhill trails
- Freeride routes
- 4X tracks
- Certain downhill sections of short XC routes

(NB: All trails require good forest road access for uplift vehicles)

Trail Gradient

The ideal trail for a four wheeler has a predominantly downhill gradient throughout. Whilst it is possible to self propel a four wheeler on the flat and up shallow gradients, it is not possible to the same level of efficiency as a two wheeler. Where a two wheeled bike can be pedalled to gain momentum a four wheeler will struggle to regain momentum following flat or uphill sections. A four wheeler can be jumped in the same way as normal bike (with 6 inches of suspension travel) but it is particularly important to take the landing impact on the exit transition. Therefore you need to be able to carry enough speed into a jump to achieve this. Steep straight downhill gradients are fine for 4 wheelers; however turns across steep gradient with an off-camber are not good. Look for opportunities to create sections within a trail network and make them suitable for integrated use. Consider the use of high quality surfacing to assist in maintaining momentum, especially on the approach to jumps, table tops and where the average gradient drops below 3%.

Width of Trail

Ideally the trail needs to be wider than the width of the bikes at 0.9m. This does not mean that the prepared width of trail needs to exceed this dimension for its entire length. It is often necessary to ride a four wheeler with one side off the prepared surface in the undergrowth. The main thing that prevents the use of singletrack is very narrow bench cut single track and raised boardwalk of less than 1m. It is particularly frustrating for riders to find perfectly usable sections of singletrack that have a short section of boardwalk that is 0.8m wide. Boardwalk of this width is not in place to provide the challenge of riding a 'skinny' obstacle for two wheeled riders. It could therefore afford to be a little wider to accommodate four wheelers without spoiling the challenge in any way.

Trail Features

As mentioned earlier it is possible to jump a 4 wheel bike in the same way as a 2 wheeler. Small drop-offs up to 0.5m can also be ridden. Technical trail features and natural terrain such as rock gardens are usually ok, providing they are wide enough. Raised boardwalk sections and fun boxes are fine again providing they are wide enough and the corners are not likely to throw the wheels off course. TTF's and jumps in existing routes that are not suitable for fourcross riders e.g. large drop-offs, bomb holes, etc. may just need a short alternative route (a ride around) to allow them to bypass an obstacle and still use the rest of the trail.

Entry/exit barriers to trails obviously also need to exceed four wheeled bike width. Usually 0.15m either side of the bikes is sufficient to allow them to get through unhindered. This allows for the fact that a turn is often required as gates are usually staggered. The more generous the spacing and stagger of the barriers will allow safer use of the trails. The trail demarcation also needs to be considered with the width of four wheel bikes in mind. Especially given the need for them to sometimes ride the bikes on the rougher ground to one side of a finished trail.

Tested Trails

Below is a list of trails that have been successfully used on 4 wheeled bikes. This should help trail builders further visualise what is possible on four wheels. **See website for our trail ratings;**

- Laggan Wolftrax - Bike Park
- Glentress - Freeride Park (Essentials, Un-named Trail), Spooky Wood
- Innerleithen - Make or Brake, Cadon Bank
- Ae Forest - The Shredder, Ae Line (Omega Man)
- Mabie Forest - Skills Area (Freeride Line), Phoenix Trail (Descender Bender)
- Fort William - Off-Beat Downhill, Nevis Red Trail
- Hamsterley Forest - DH1, Four Cross Course
- Whinlatter Forest - Altura Trail (South Loop), Quercus Trail, Seldom Seen
- Forest of Dean - Ski Run, Sheepskull, Flatland, Corkscrew 1 and 2
- Llandegla Forest - Beginner, Intermediate, Advanced
- Cwm Carn - Y Mynydd Mojo

Bike Specification

- Width 0.9m
- Length 1.57m
- Weight 35kg
- Turning Circle 5.5m
- Independent Fox Vanilla R suspension (6" of travel)
- Hayes hydraulic disc brakes
- 20 inch (BMX) front wheels
- 24 inch or 26 inch (MTB) rear wheels

Lessons learned

4X courses in general are not great to ride on these bikes. The surfacing and width is good for the bikes but the design of the features and gradients are not. It requires too much effort to maintain the momentum (two wheeled riders can put in pedal strokes) and that makes the flow of the track and jumps hard to ride.

When designing new trails it is usually possible to cater for four wheel bikes without compromising the challenge for two wheeled riders. The main factors are;

- Uplift access:
  Currently a private service is provided by the club, with permisson to access the necessary venues with transport granted by the Forestry Commission.
- Trail Features:
  Table tops, step up/downs and doubles are all possible providing it is possible to carry sufficient speed into the take off to achieve the landing transition.
- Trail Gradient:
  Average of +6% whilst considering momentum, flow, width of trail and surfacing. The “rough guide” to a suitable gradient is if you can roll it on a 2 wheeled bike without pedal strokes, from top to bottom, and still get small to moderate air off the jumps etc. then the gradient is probably about right.

Due to the extra drag of four wheels a high quality smooth surfacing is important to allow the bikes to maintain the speed and momentum on flatter sections (for example if it’s less than 6% gradient) on the trails they are using. If the main parts of the trail surface are slightly rougher it is better to make the entry into the features as high a quality of surface as possible.

Future Development

It is important to emphasise that 4 wheel mountain biking is a very new activity. Riders have only been participating in the activity in this country since 2005. Due to the limited number of suitable riding sites and the inability to use existing uplift facilities it has been difficult for them to ride on a regular basis and improve their riding technique. This is inhibiting the development of the activity and is making it difficult to attract new participants. There seems to be a general lack of awareness of the requirements set down in the DDA to provide access to trails and uplift services for disabled riders. By raising awareness, future trail building can accommodate these needs without compromising the overall nature of a trail.

Examples of four wheel bikes on existing trails

Uplift demo at Cwm Carn

Bermed corners at Laggan

Jumps at Laggan