Bind Analysis & Cutting
Types of Binds

- Top
- Bottom
- Side
- End
- Compound
Top Bind

Top cut and finish from bottom, add pie cut if needed
Top Bind

Top cut
Top Bind

Cut from Top and Wedge
Bottom Bind

Underbuck, then top cut. Be ready for lots of movement.
Bottom Bind

When possible cut at bearing point
Bottom Bind

Watch kerf as it opens during release cut
Bottom Bind Video
Side Bind

Safely relieve bind on compression side
Side Bind Video
End Bind

Use wedges to offset compressive forces from weight of log
End Bind Video
End Bind

Use wedges to offset compressive forces from weight of log
Compound Binds

- Combination of two or more binds
- Can move and change during the cutting process
  - Cutting the log reduces weight in sections and changes bind
- Side binds usually transition to top or bottom bind as the side bind is relieved
- Also includes twisting or torsional binds
- Constantly assess log for changes in the binds and kerf
Compound Binds

- Side bind transitions to more bottom bind
- Changes in bearing points
- Torsional bind due to holding wood

Bearing Points

Movement
Binds Review

- Top bind
- Bottom bind
- Side bind
- End bind
- Compound binds

Remember…
Cut the Compression Side First!
Break Time?

![Bowl of nuts](image1)
![Coffee cup](image2)
![Water bottle](image3)
![Outhouse](image4)
Commonly Used Cuts

**Straight Cuts**
- Continuous top or bottom bind
- Low bind conditions, small logs

**Compound Cuts**
- Large logs, hillside logs, end bind
- Allows for easy release

**Off-Set Cut**
- Continuous top or bottom bind
- Straight cuts with offset
- Protection for crosscut saws
- Allows for control of release
Commonly Used Cuts

**Pie Cut**
- Use with all binds
- Use to allow for travel and control
- Useful with chain saw
- Rarely used with crosscut saw

**Double Cut**
- Severe side bind, large rotten logs
- Logs with torsion, shattered log
- Can be used to relieve side bind for crosscut saw
Straight Cut

- Continuous top bind
- Continuous bottom bind
- Low bind conditions or smaller logs
- Used in underbucking situations
Compound Cut

- Face the direction to roll out section and make a “V” with arms
- Two angled cuts allow for clearance to roll out section
- Top angle opens outward and is tilted, to be wider on the top than bottom of log
- Back up with wedges or hanging wedges
**Off-Set Cut**

- Allows controlled release of cut section
- Compression cut first
- Tension cut second
  - Off-set top kerf approximately $\frac{1}{2}''$ from bottom kerf
  - Allow the cut piece to drop and the kerfs overlap to sever the holding wood
Off-Set Cut

Cut Section

Fixed Log

$\frac{1}{8}''$ to $\frac{1}{2}''$ Offset
Pie Cut

- Useful with heavy bind, to remove material to allow log to move and to control the movement of the log.
- Angle of pie cut only needs to match the expected angle the log needs to change, usually 10-30°.
- Don’t cut deeper than 1/3 of the diameter of log.

![Pie Cut Diagram]
Double Cut

- Single buck to cut two parallel top kerfs
- Remove wood fiber from between two kerfs with Pulaski
- Repeat until log is severed or bad wood is removed
- Can be used with compound binds when they are too complex to identify dominate binds
Double Cut

- Binds can change across the split sections and cutting across the splits can bind the saw
- Cut two parallel cuts, each one a little at time
- Use poll of ax to knock out cut sections
What type of cut would you use?
Review: Commonly Used Cuts

- Straight Cut
- Compound Cut
- Off-Set Cut
- Pie Cut
- Double Cut
Wedging

Cut into the compression first…and carry lots of wedges
Wedging

Wedge as soon as the saw is fully in the log
Wedging

Use wedges to turn a top bind into a bottom bind
Wedge Placement

1
2
3
4
5
Safe Working Area

- Establish safe quadrant and escape route(s)
- Stabilize work area for solid footing
- Prepare work site
  - Mitigate hazards
  - Brush out and limb work area and escape route(s)
  - Remove tripping hazards
  - Secure around root wad
- Prepare cut track routes
- Establish safe areas for crew
- Control traffic on the trail – especially switchbacks
Site Preparation

- Remove branches
- Remove debris from tread
- Remove spring poles
- Remove bark (crosscut)
- Prep bucking location
- Support aids, if needed
Site Preparation

Ensure stable footing – may need to create bench in slope
Site Preparation

Clear out underneath log
Site Preparation

Build cribbing to support cut pieces or to change binds
Site Preparation

Use supports (rails) and mechanical leverage to move logs
Cutting Sequence

- **Cutting sequence is extremely important …**
  - Reduces hazards
  - Releases stored energy in the wood
  - Can reduce the amount of work
  - Provides for a safer work site
  - Work smart … Not hard!
Cutting Sequence

- Assess binds, pivots, supports, bearing points
- Determine safe areas to work
- Address the level of complexity
- Focus on cutting sequence to remove stored energy in a controlled manner
- Don’t be target focused – may need to start at far end to safely mitigate hazards
Plan for Release Cut

- Is there room for the cut piece to release? Type of cuts?
- How will the log move? What is the safe side?
- Where will the cut piece travel?
Cut Piece Track

- Secure switchbacks for trail users, if needed
- Plan for use of added supports to guide or move after cut (rails or pivots)
- Clear path and add supports BEFORE cutting begins
Leaving the Project Site

✓ Is everything secure?
✓ Do you have all tools?
✓ Is the tread restored?
✓ Is the setting restored?

If there is any dangerous condition that you are unable to correct…
If it is a hazard to normal hiker or equestrian safety...

Flag It!

Inform Land Manager As Soon As Possible

☑ Note location
☑ Condition details
☑ Equipment needed
☑ Forest condition
☑ Landscape conditions
Where to Cut

- Trim branches flush with trunk rather than remove tree.
- Leave brush below 3’ above the level of the tread.

Vertical Clearing Limit 10’

Cut

Trailbed 3’
To Fall or Not to Fall?

Which one of these would you or should you cut?
Incidents: Lessons Learned

- Link: Lodgepole Bucking Injury
- Link: Hazard Tree Study
Working in Team Video