



Complexity Chart Reference Tool

Limbing

Low	Moderate	High
		
Objective Low complexity limbing is a common activity encountered on the fireline. Whether prepping indirect fireline along roads, or limbing trees within the fire's edge while performing direct suppression tactics, most saw operations encompass some type of limbing activity.	Objective Moderate complexity limbing may become more difficult to accomplish based on tree species, vegetation cover and density, terrain influences, additional personnel in the area, and pace of operations.	Objective High complexity limbing is often encountered when sawyers must release limbs under high tension, when sawyers and swampers work in close proximity to one another, on steeper slopes with poor footing, and when operational tempo increases.
Hazards - Minimal hazards are present and will have little effect on the cutting operation. - Hazards are static (unchanging). - Hazards are of low severity and consequence.	Hazards - Multiple hazards are present and able to be identified. - Hazards begin to influence the cutting operation. - Hazards increase in severity and potential consequence.	Hazards - Numerous hazards are present and may or may not be identified. - Hazards have a direct effect on the cutting operation and Go/No-Go decision. - Hazards are dynamic (changing or likely to change). - Hazards have high severity and consequence.
Leans and Binds Known low release of energy expected and easily observed.	Leans and Binds - Release of energy known but may require a series of cuts to mitigate. - Size and orientation of limbs increases binds.	Leans and Binds - High release of energy expected. - Binds may be difficult to predict.
Escape Plan Escape path is clear and easily accessed if needed.	Escape Plan - Escape paths are limited. - Ground cover, footing, or topography reduce mobility.	Escape Plan - Access of escape path becomes difficult. - Greater distance and hastened escape required.
Cutting Plan Single cut sequence.	Cutting Plan Multiple cut sequence to mitigate energy release.	Cutting Plan - Cutting height above shoulders. - Abnormal body positioning. - Cut sequence affects stability.

Bucking

Low	Moderate	High
		
Objective		
Low complexity bucking generally takes place on flatter ground and on smaller diameter trees and logs that can be easily moved and controlled.	Moderate complexity bucking can involve situations of multiple downed logs (with binds that become difficult to read), increasing diameter of material to be cut, increase in the effects of terrain, and a necessary pre-plan of how to move cut material.	High complexity bucking takes place in situations such as areas of recent storm damage and post fire landscape, with a deeper fuel bed of downed material (with multiple binds that become difficult to read, or may not be unseen, and an expected dynamic release of energy). High complexity bucking can also be encountered when large material is being cut, and the material size, or the terrain, can cause issues with controlling or removing severed pieces.
Hazards		
- Minimal hazards are present and will have little effect on the cutting operation. - Hazards are static (unchanging). - Hazards are of low severity and consequence.	- Multiple hazards are present and able to be identified. - Hazards begin to influence the cutting operation. - Hazards increase in severity and potential consequence.	- Numerous hazards are present and may or may not be identified. - Hazards have a direct effect on the cutting operation and Go/No-Go decision. - Hazards are dynamic (changing or likely to change). - Hazards have high severity and consequence.
Leans and Binds		
- Low release of energy expected. - Little to no binds that are easily observed.	- Release of energy known but may require a series of cuts to mitigate. - Multiple bind situations that are easily observed.	- High release of energy expected or unknown binds. - Multiple bind situations that are difficult to determine. - Cantilever logs or trees with root wads attached.
Escape Plan		
Escape paths are clear and easily accessed if needed.	- Escape paths are limited. - Ground cover, footing, or topography reduce mobility.	- Access to escape path(s) becomes difficult. - Greater distance and hastened escape required.
Cutting Plan		
- Sound fiber. - Normally a single kerf sequence, less than bar length.	- Compromised fiber. - Multiple cut sequence to mitigate energy release or maintain control of cut material.	- Compounding situations influence the cut sequence and may result in a change of complexity. - High potential for failure and loss of control of material. - Severe consequence for damage or injury.

Brushing

Low	Moderate	High
		
Objective		
Low complexity operations are a common occurrence during brushing. Sawyers may often be brushing material along a road, trail, or handline to decrease fuel depth and loading. In low complexity operations, cut material is easily observed and removed by the sawyer themselves or a swamper.	Moderate complexity brushing generally takes place in denser fuel types, or steeper work areas, which necessitate the use of one or multiple swampers. Fuel density makes maintaining sight of the guide bar more difficult, resulting in increased opportunities for kickback. Increased control of the chainsaw bar is important to maintain efficiency and avoid striking hard surfaces (i.e., rocks) and dulling the chain.	Operational tempo often contributes to high complexity brushing situations. For example, a sense of urgency in the sawyers' pace and cut plan are required to mitigate increases in fire behavior. In very steep terrain, brushing becomes increasingly difficult due to poor footing, awkward body positioning, and the tendency to overreach. In very dense, tall brush, the cut sequence becomes increasingly difficult to manage and may require extra steps to remove material.
Hazards		
- Minimal hazards are present and will have little effect on the cutting operation. - Hazards are easily observed and static or unchanging. - Hazards are of low severity and consequence.	- Multiple hazards are present and able to be identified. - Hazards begin to influence the cutting operation. - Hazards increase in severity and potential consequence. - Cutting area control and proximity of sawyer/swamper team(s) require heightened situational awareness and mitigations.	- Numerous hazards are present and may or may not be identified. - Hazards have a direct effect on the cutting operation and Go/No-Go decision. - Hazards are dynamic (changing or likely to change). - Hazards have high severity and consequence. - Multiple sawyer/swamper teams and crewmembers working together to move material.
Leans and Binds		
Known low release of energy expected and easily observed.	- Release of energy known but may require a series of cuts to mitigate. - Size, weight, and orientation of material have increasing effect on cuts.	- High release of energy expected or unknown. - Different types of large brush often grow intertwined, causing binds that are difficult to determine.
Escape Plan		
Escape path is clear and easily accessed if needed.	- Escape paths are limited. - Ground cover, footing, or topography reduce mobility.	- Access to escape path becomes difficult. - Greater distance and hastened escape required.
Cutting Plan		
- Stem by stem or easy to observe bar tip. - Topography has little effect on the cutting plan.	- Cut sequence becomes more important. - Communication must be established between sawyer and swamper as part of the cutting plan.	- Removal of cut material becomes more critical to the cutting operation. - Aids such as windows and key holes become part of the cutting plan.

Felling

Low	Moderate	High
		
Objective		
Fall tree to any direction.	Fall tree to within 45 degrees of specific lay.	Fall tree to within 5 degrees of specific lay.
Hazards		
- Minimal hazards are present that will impact cutting operation (0-2 individual hazards). - Hazards are static (unchanging).	- Hazards are present but can be easily identified and understood. 3-5 individual hazards.	- Hazards are present but may be mitigated by altering cut plan and technique. - More than 5 individual hazards. - Hazards are dynamic (changing or likely to change).
Leans and Binds		
- Side lean: < 3 ft. - Head lean: <3 ft. - Back lean does not exist with intended lay. - Binds – known low release of energy. - Leans or binds do not require wedging or sequence of cuts.	- Side lean: 3-5 ft. - Head lean: >3 ft. - Back lean: 1-2" lift to overcome. - Leans or binds may require wedging. - Binds – release of energy known but may require a series of cuts.	- Side lean: >5 ft. - Head lean: >6 ft. - Back lean: >2" lift to overcome. - Binds – high release of energy expected or unknown.
Escape Plan		
- Escape path is clear. - Multiple escape paths – easily accessed. - Diagonal both clear. - Distance from tree: 15 ft.	- Only one escape path. - Access to escape could be limited. - Distance from tree: 10-15 ft. - Cover <10 ft.	- Access of escape path could be difficult and/or in steep terrain. - No escape path: STOP/REEVALUATE.
Cutting Plan		
- Undercut/Hinge: Single cut undercut, Sound Fiber. - Sequence of cuts: All from one side, escape to same side. - Backcut: Single backcut.	- Undercut/Hinge: Compromised Fiber, Double cut undercut. - Sequence of cuts: Requires moving from side to side of tree. - Backcut: Double cut backcut.	- Backcut: >Double cut. - Cutting plan does not meet objective and needs to be changed. - Cutting plan does not meet sawyer's ability and qualifications.