

Harvesting Systems and Equipment in British Columbia



BRITISH COLUMBIA Ministry of Forests
Forest Practices Branch



Harvesting Systems and Equipment Part One

EQUIPMENT SELECTION

Chart 14 to 26

The handbook does not attempt to define a single “best” system for any site. Instead, it presumes that readers need to be aware of the key factors that influence the probability of achieving success with any given combination of equipment and site characteristics. Readers will then use their own judgement to evaluate the merits of the various options. The information in the handbook should be considered only as part of an overall process for equipment selection which will vary from company to company.

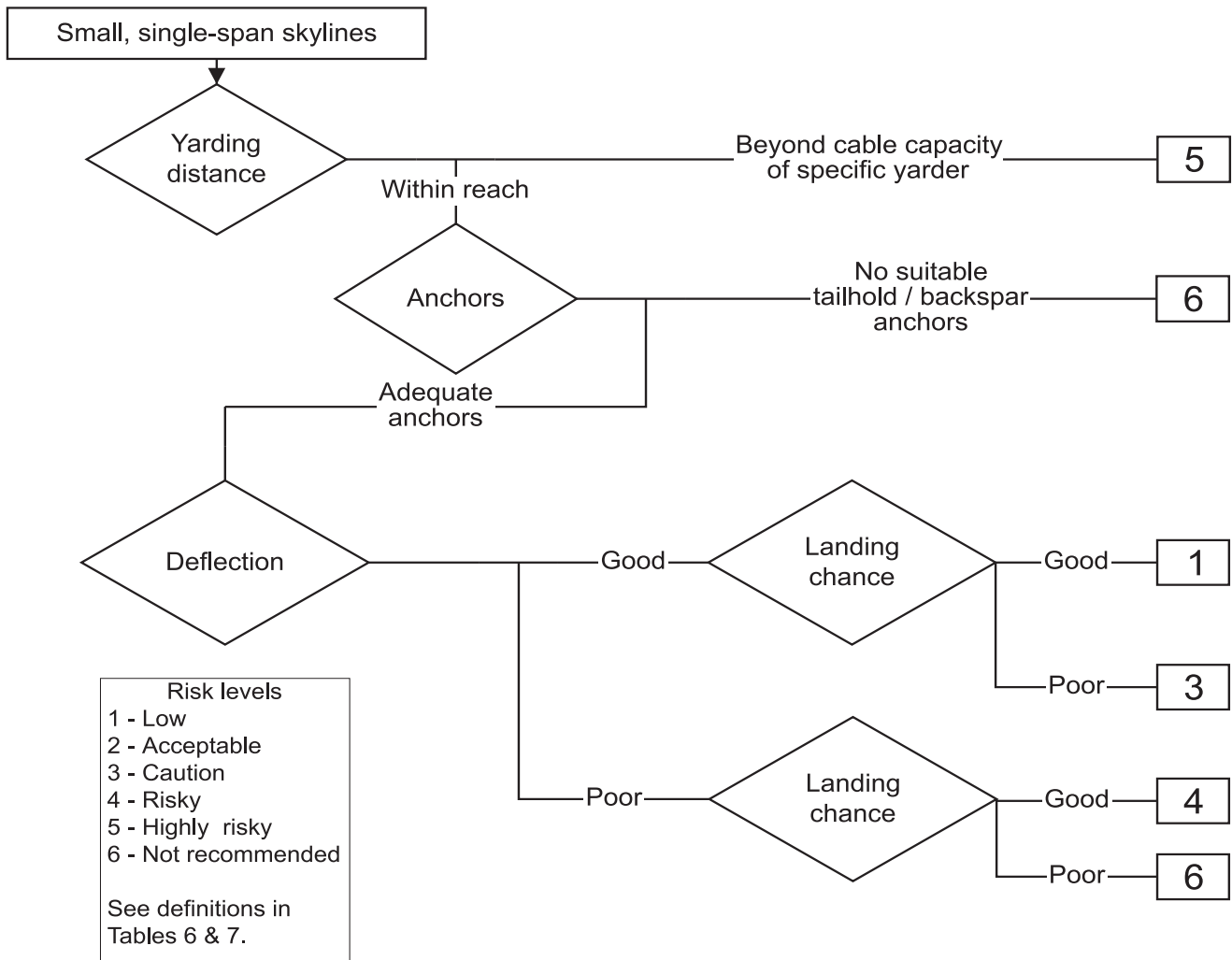


Chart 14. Small, single-span skylines.

- Landing chance refers to the ability to build and use suitable landings for extraction and subsequent phases. Poor landing chance may be caused by difficult terrain or by the combination of terrain, deflection, and the tower location within the landing.
- Risk level increases as the volume per hectare decreases.
- Payloads can be lifted over intervening obstacles, depending on deflection and clearance.
- Anchors may consist of large tree stumps, several smaller trees or stumps, or fabricated anchors such as a buried log or rock bolts.
- Cable extensions can be used to reach logs beyond the yarder's normal working distance.

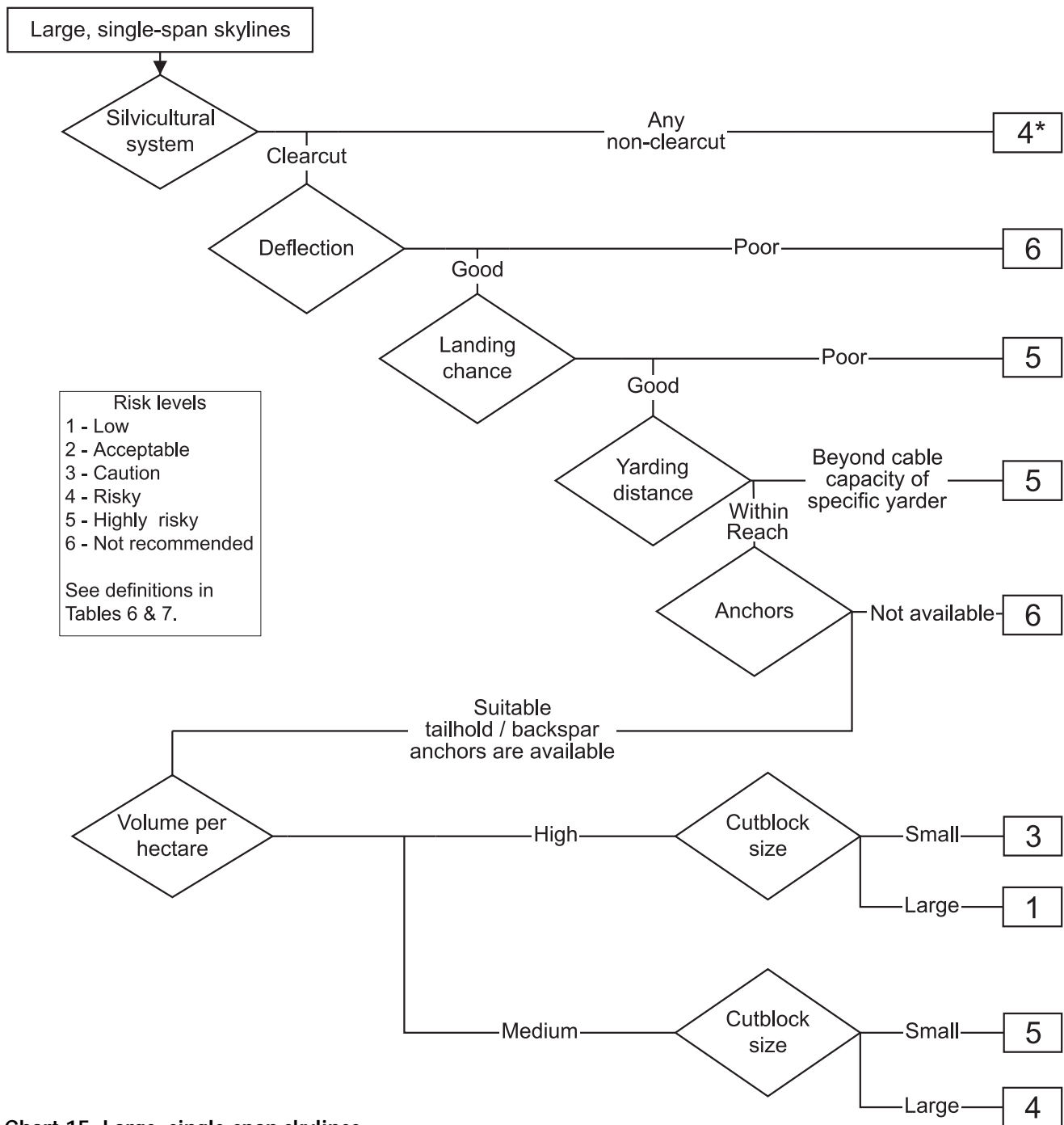


Chart 15. Large, single-span skylines.

- * • The term “large” refers both to the yarder size and the skyline span — large tower-mounted yarders and European cable cranes both qualify as “large.” However, the European cable cranes are better able to operate in non-clearcut silvicultural systems, and their risk would be lower than shown in the chart.
- Landing chance refers to the ability to build and use suitable landings for extraction and subsequent phases. Poor landing chance may be caused by difficult terrain or by the combination of terrain, deflection, and the tower location within the landing.
- Payloads can be lifted over intervening obstacles depending on deflection and clearance.
- Risk increases with too-large deflection because of the increased time required for the chokers to travel between the carriage and the ground.
- Anchors may consist of large trees or stumps, or fabricated anchors such as a buried log or rock bolts.
- Cable extensions can be used to reach logs beyond the yarder’s normal working distance.

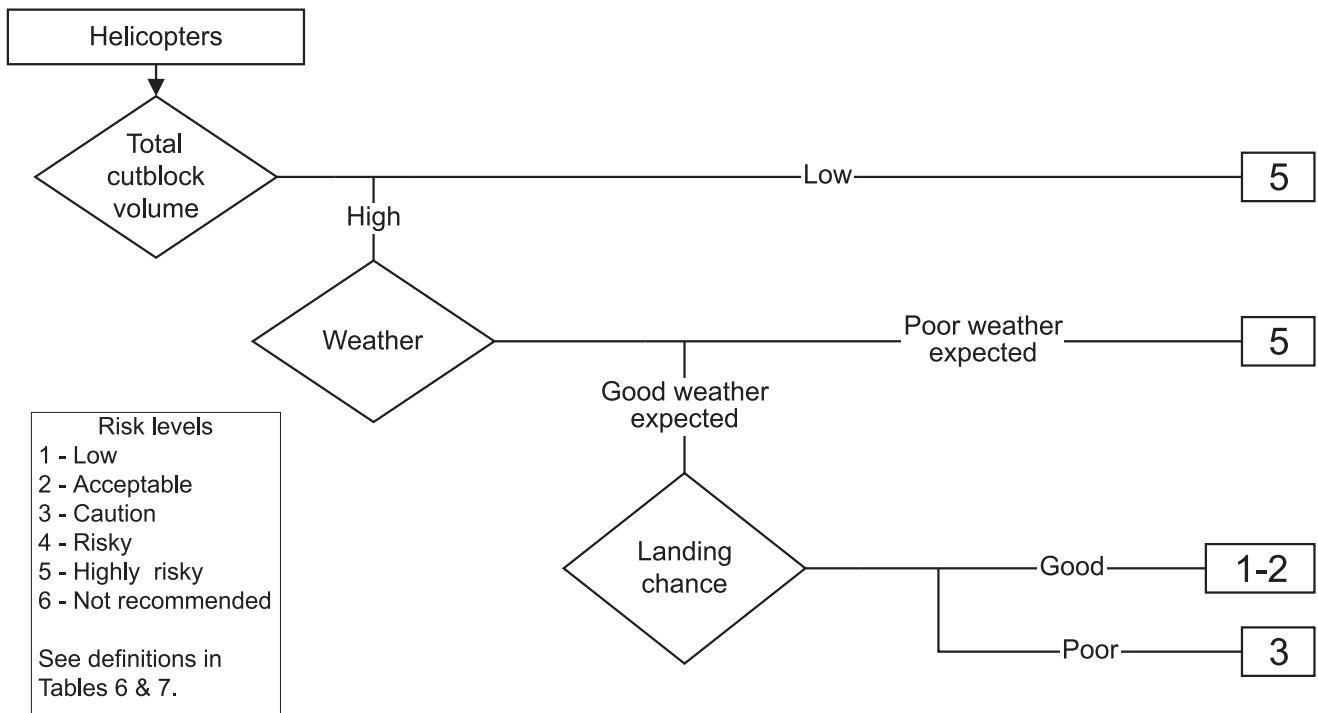


Chart 16. Helicopters.

- Suitable landings are large enough to handle the expected volume of logs without causing delays. Flying, processing, storage, and loading must all be accommodated. A separate landing for helicopter fueling and maintenance is required.
- Risk level increases when multiple hookup sites are not available, with long flying distances, and with adverse or very steep favourable slope between the hookup site and the landing.
- Poor weather such as high wind or reduced visibility can affect the ability of the helicopter to fly safely.
- Payloads can be lifted over intervening obstacles.

Key Factors for Falling Equipment

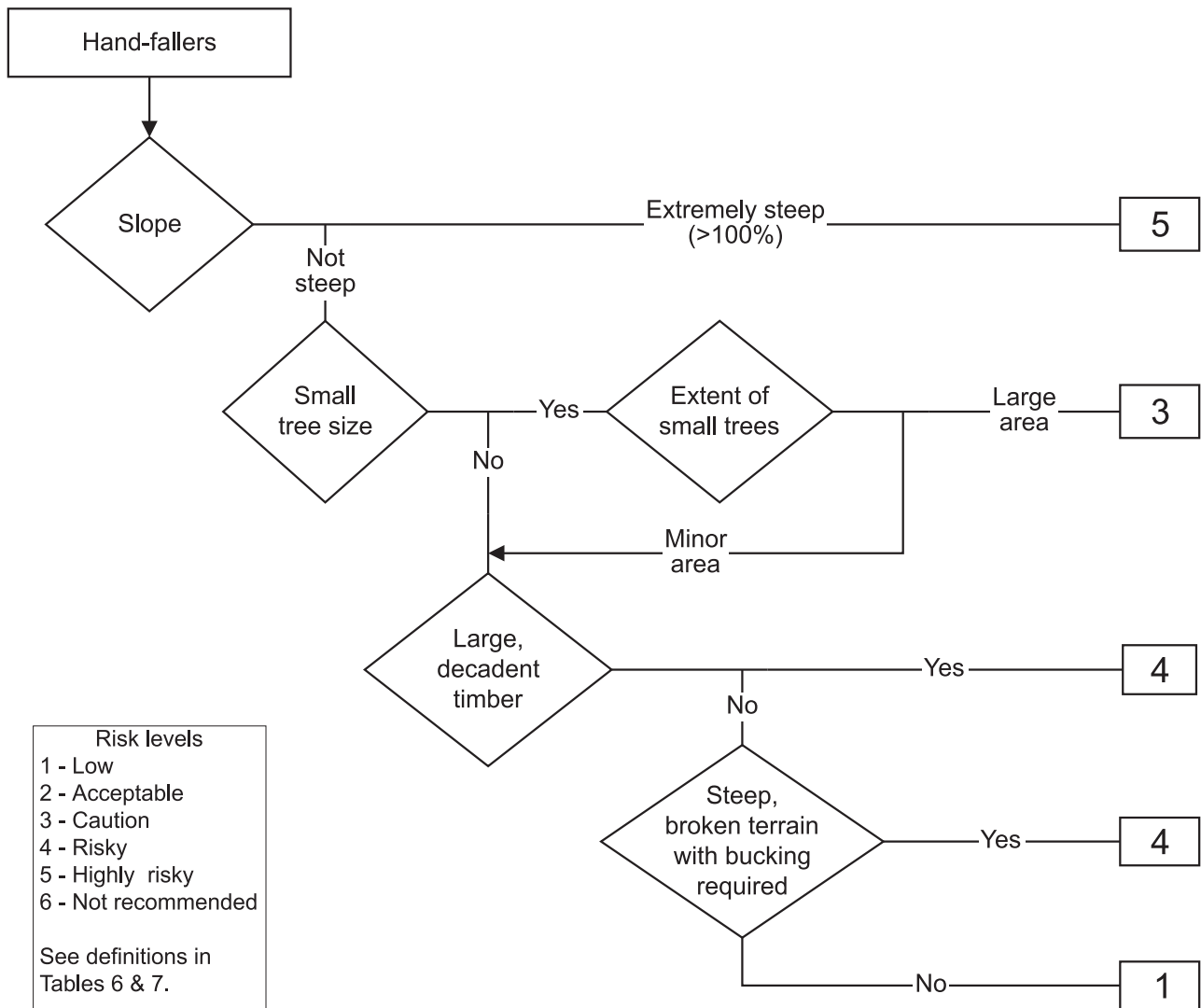


Chart 17. Hand-fallers.

- Hand-fallers can work on almost any site, within the limits of economics and safety.
- Falling small trees by hand is expensive, especially after considering the costs for extraction. Except with very small trees, hand-fallers are unable to build bunches.
- Hand-falling in decadent timber and bucking timber on steep, broken terrain are especially hazardous.

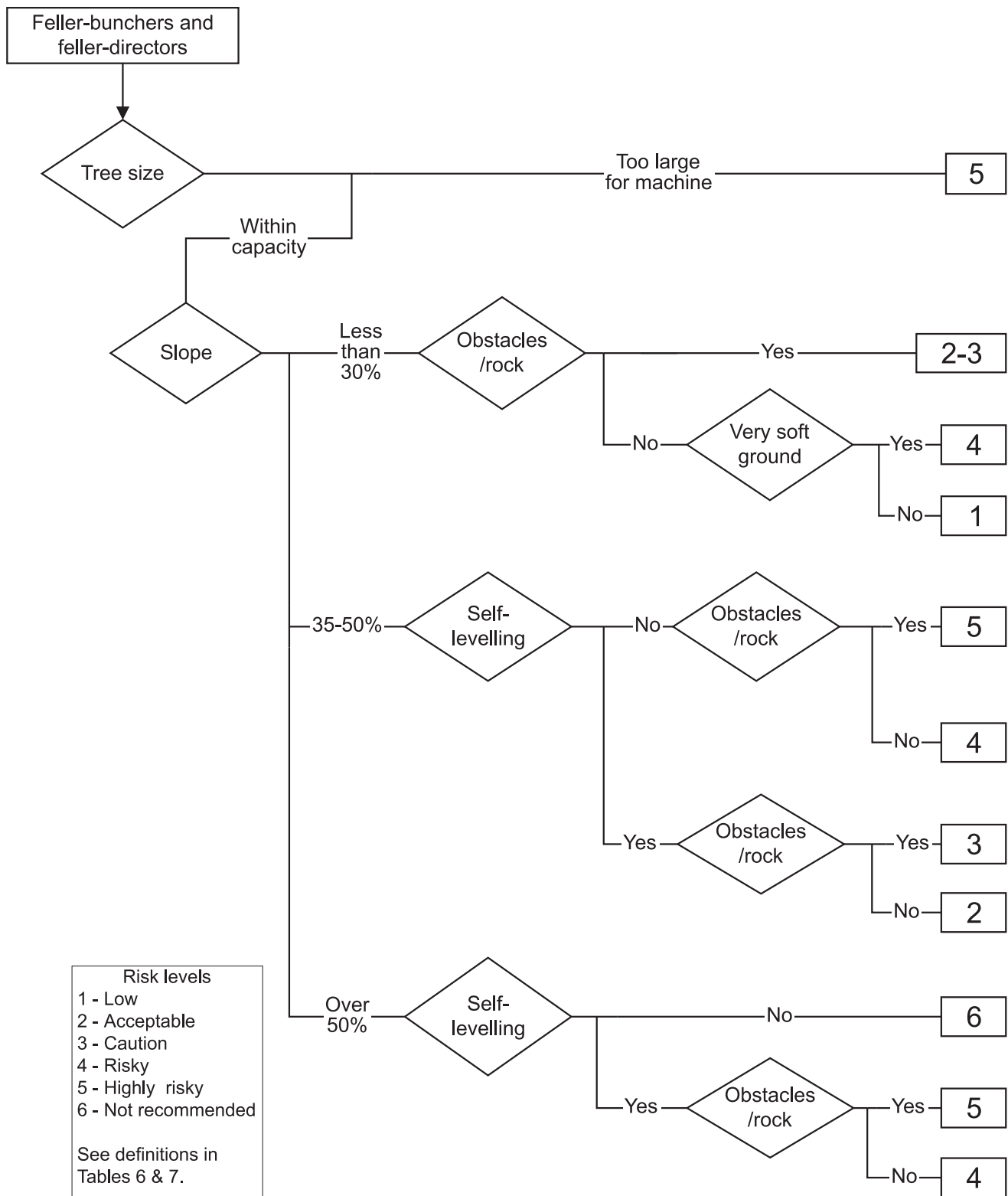


Chart 18. Feller-bunchers and feller-directors.

- Maximum tree size depends on the make and model of the carrier and head. Typical maximum tree diameter is about 60 cm, although larger heads up to 75 cm are available. Larger trees can be cut by approaching the tree from two or more sides.
- Feller-directors can handle larger trees than feller-bunchers, but they are poorly suited to making bunches.

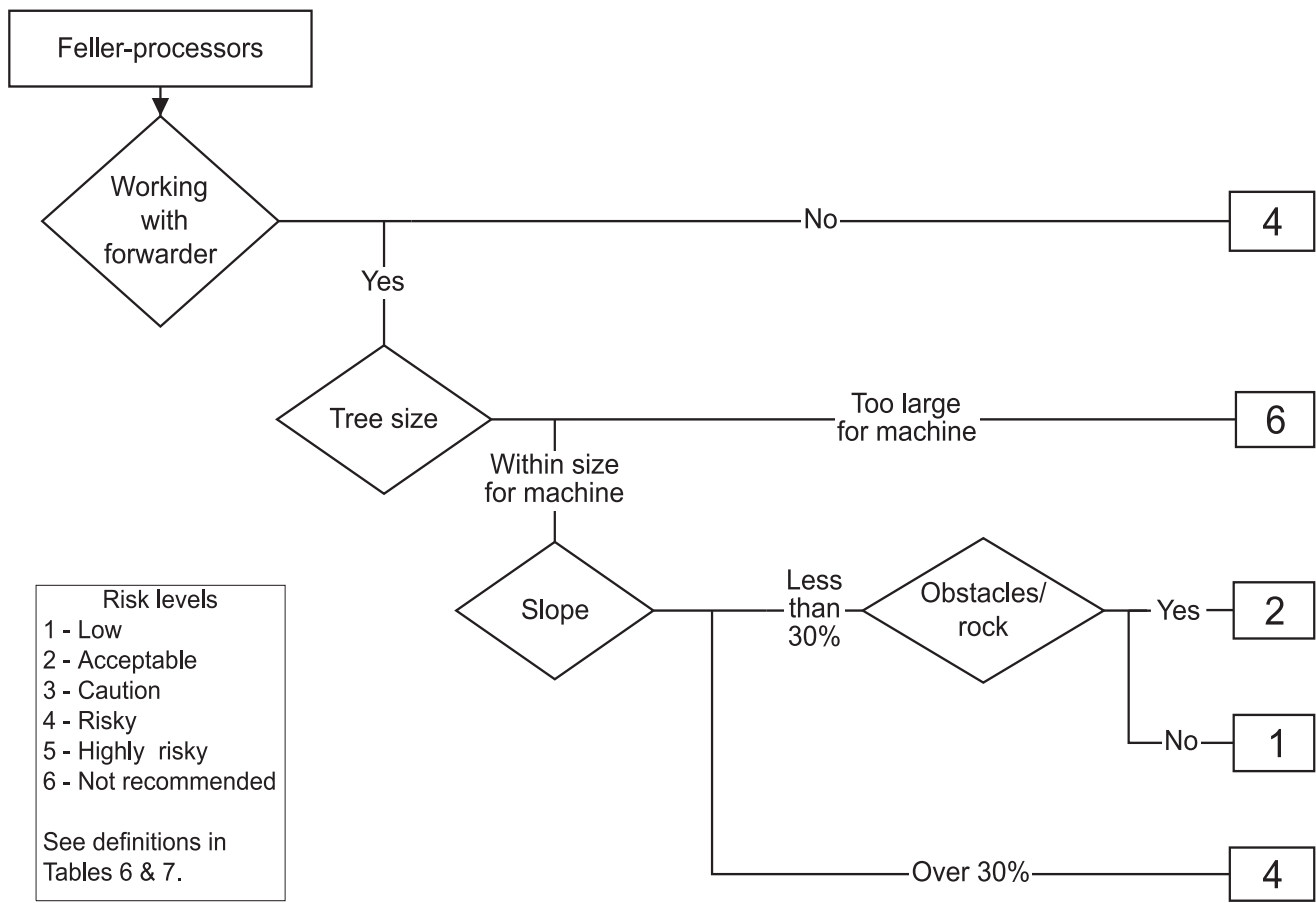


Chart 19. Feller-processors.

- This chart applies to feller-processors mounted on articulated, rubber-tired carriers. Use the “feller-buncher” chart for single-grip feller-processors mounted on excavator-style carriers.
- The maximum tree diameter for current single-grip feller-processors is about 50 cm. Current double-grip feller-processors can handle trees to about 65 cm diameter.
- Feller-processors must be able to accurately and reliably measure log lengths.

Key Factors for Processing Equipment

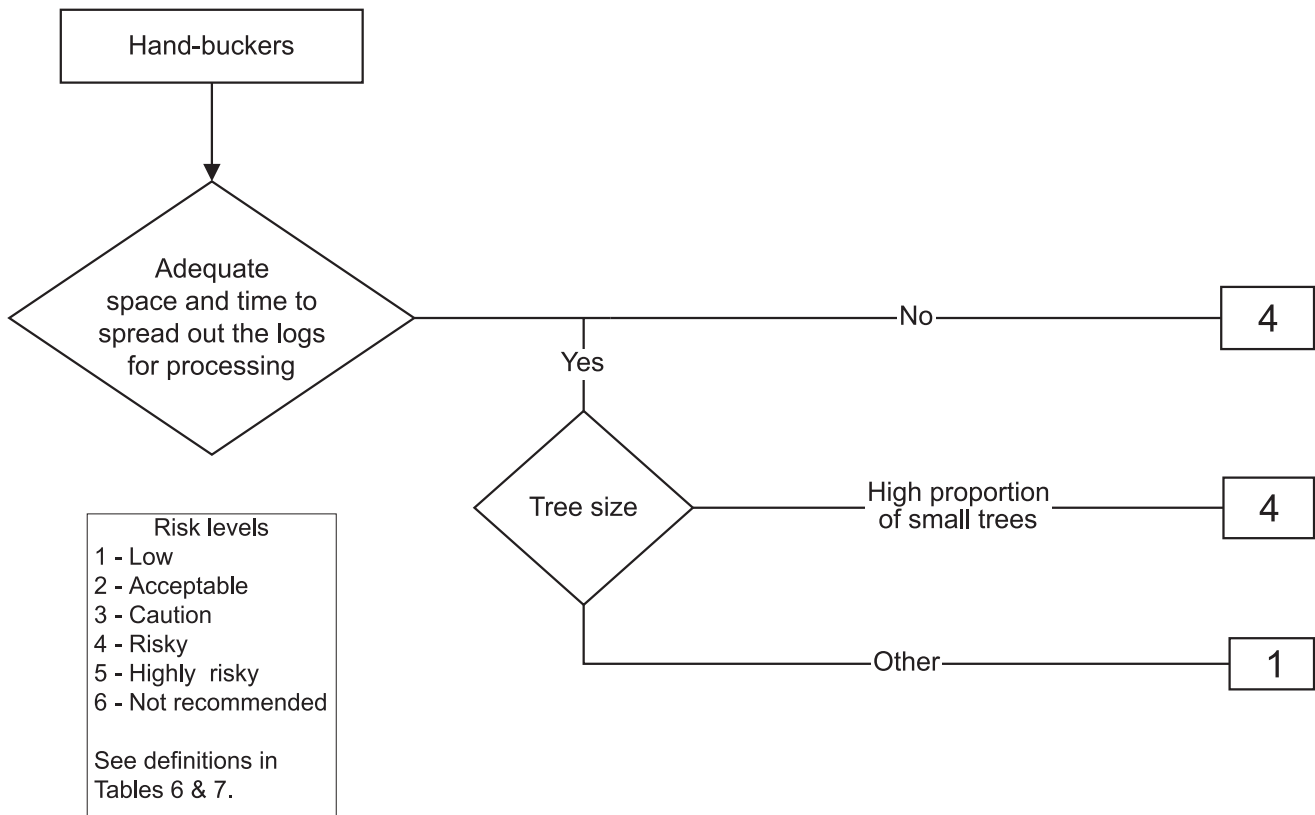


Chart 20. Hand-buckers.

- Hand-bucking can be used on almost any site, within the constraints of safety and economics. Since hand-buckers require support equipment to move the logs, the bucker and support equipment must be able to work together safely. This requires adequate time between cycles of the loading or skidding equipment, and adequate space to spread out the logs for the bucker to examine and cut each log. Such conditions may be impossible to achieve on sites with a high proportion of small trees.

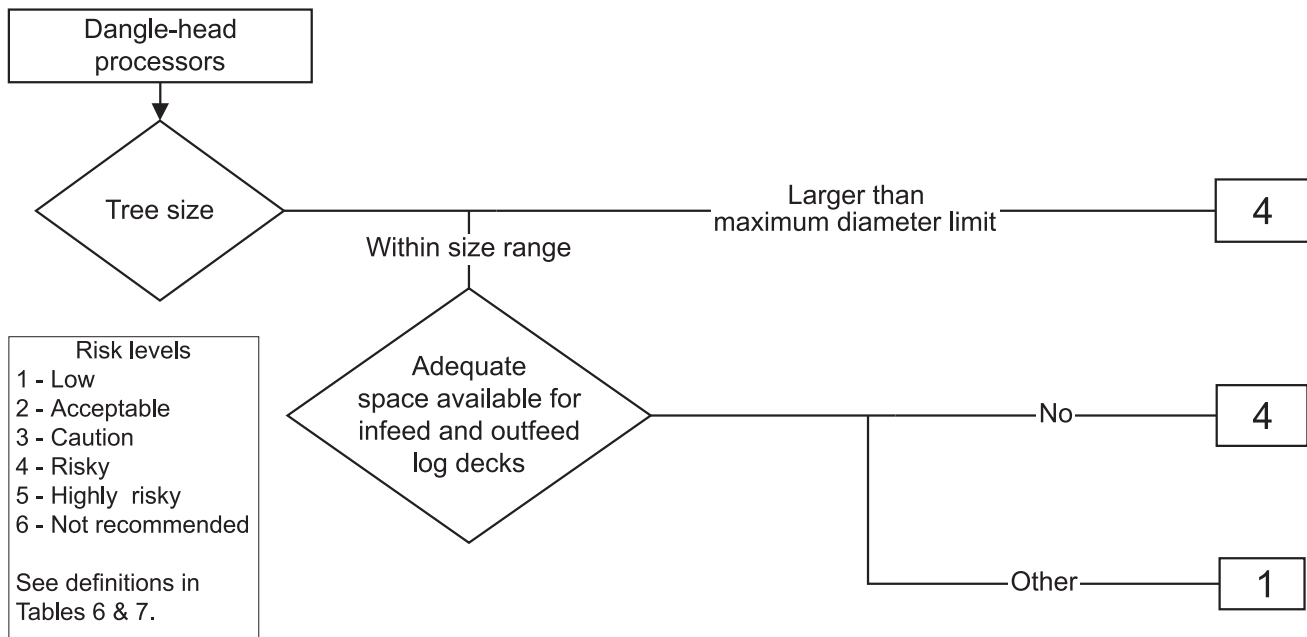


Chart 21. Dangle-head processors.

- Dangle-head processors are typically used for smaller trees, with a maximum diameter of about 50 cm; however, some models can process logs up to 80 cm diameter. Trees larger than the rated maximum diameter can be handled by grasping the tree above the butt, where the diameter is smaller. Trees can also be left lying on the ground, and the processing head passed over them without actually lifting the tree.

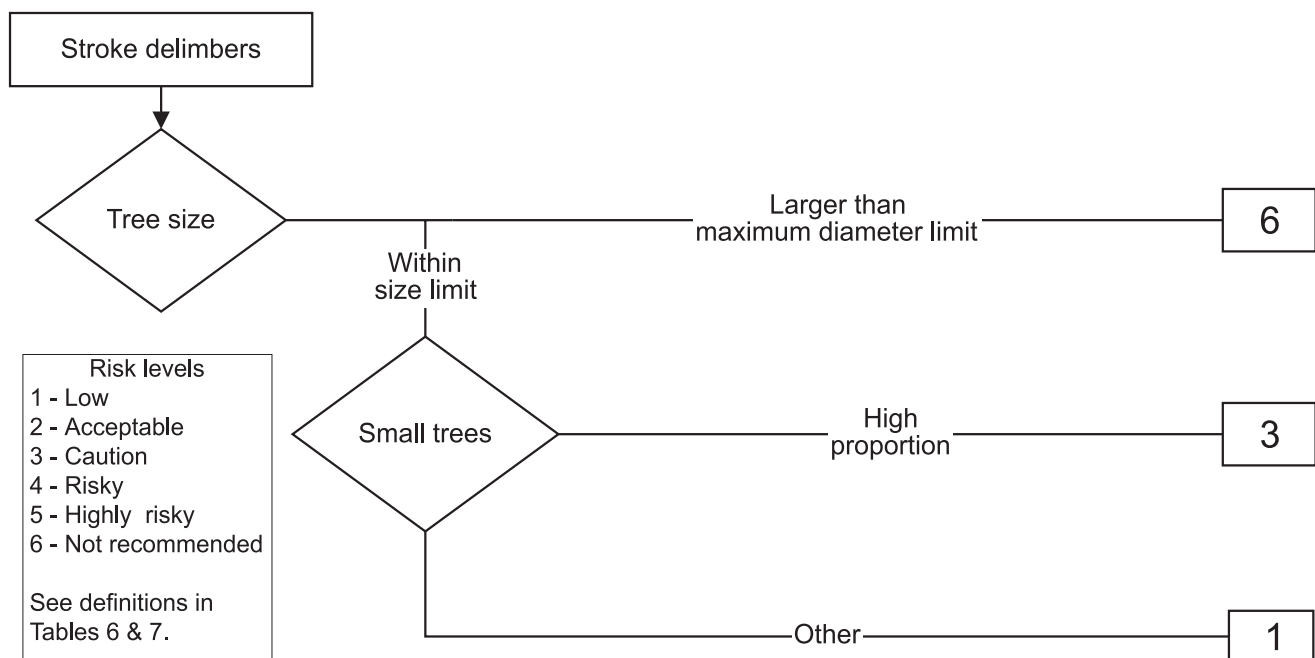


Chart 22. Stroke delimiters.

- The maximum tree size for stroke delimiters is governed by the diameter of the tunnel through the machine — the trees must be able to fit through the tunnel.
- Stroke delimiters are less efficient for small trees than dangle-head processors because they pass over each log twice to complete the processing cycle. However, stroke delimiters can process several small trees simultaneously.

Key Factors for Loading Equipment

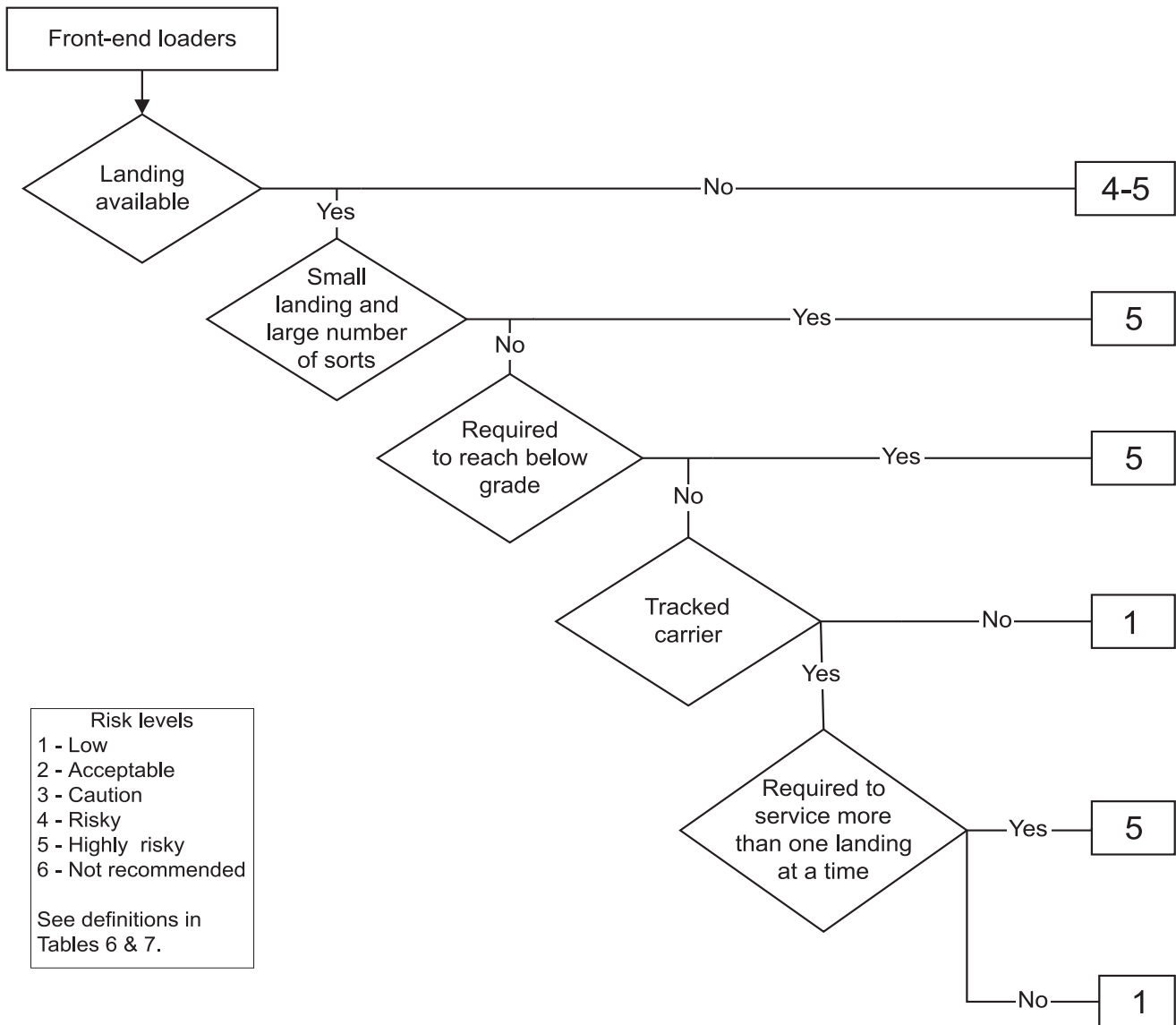


Chart 23. Front-end loaders.

- Wheeled front-end loaders can be moved quickly between sites several kilometres apart. Loaders on tracked carriers require low-bed transportation.

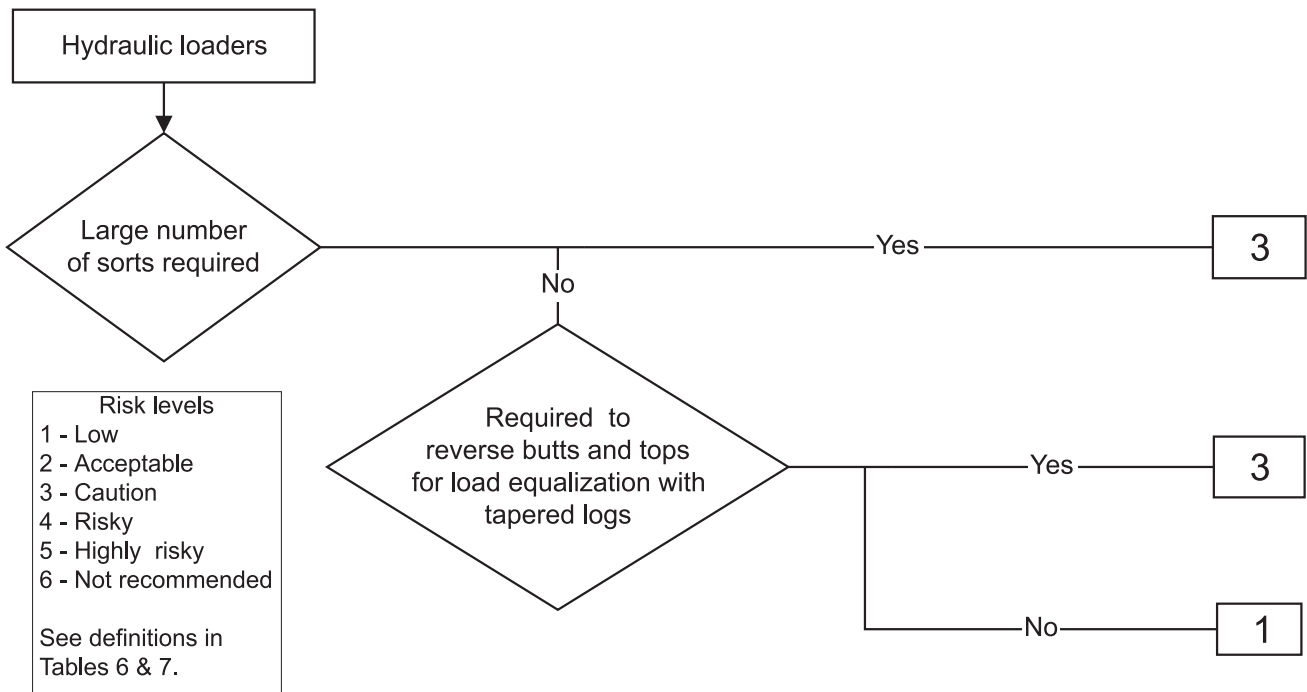


Chart 24. Hydraulic loaders.

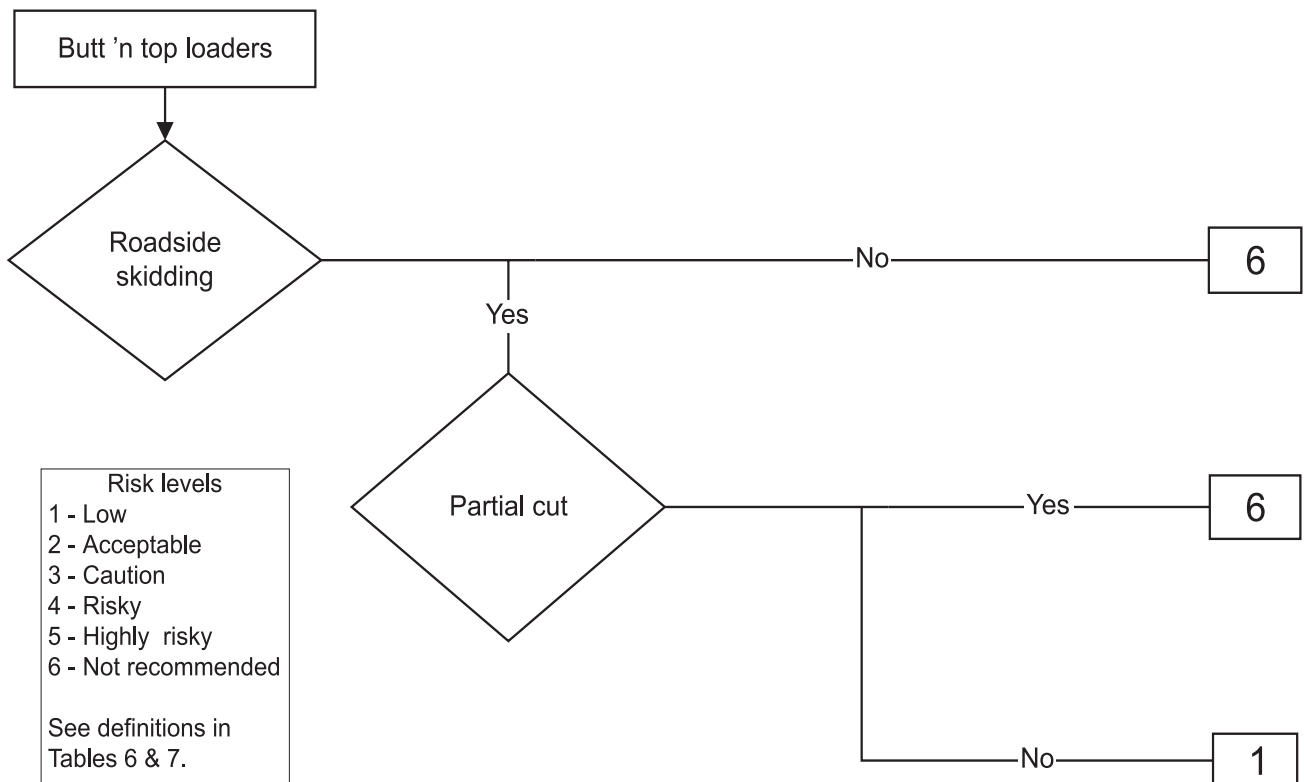


Chart 25. Butt 'n top loaders.

- Suitability of a cutblock for roadside logging is often determined by the ability of the butt 'n top loader to operate adjacent to the road. Sideslopes must be low enough for the loader to operate safely.

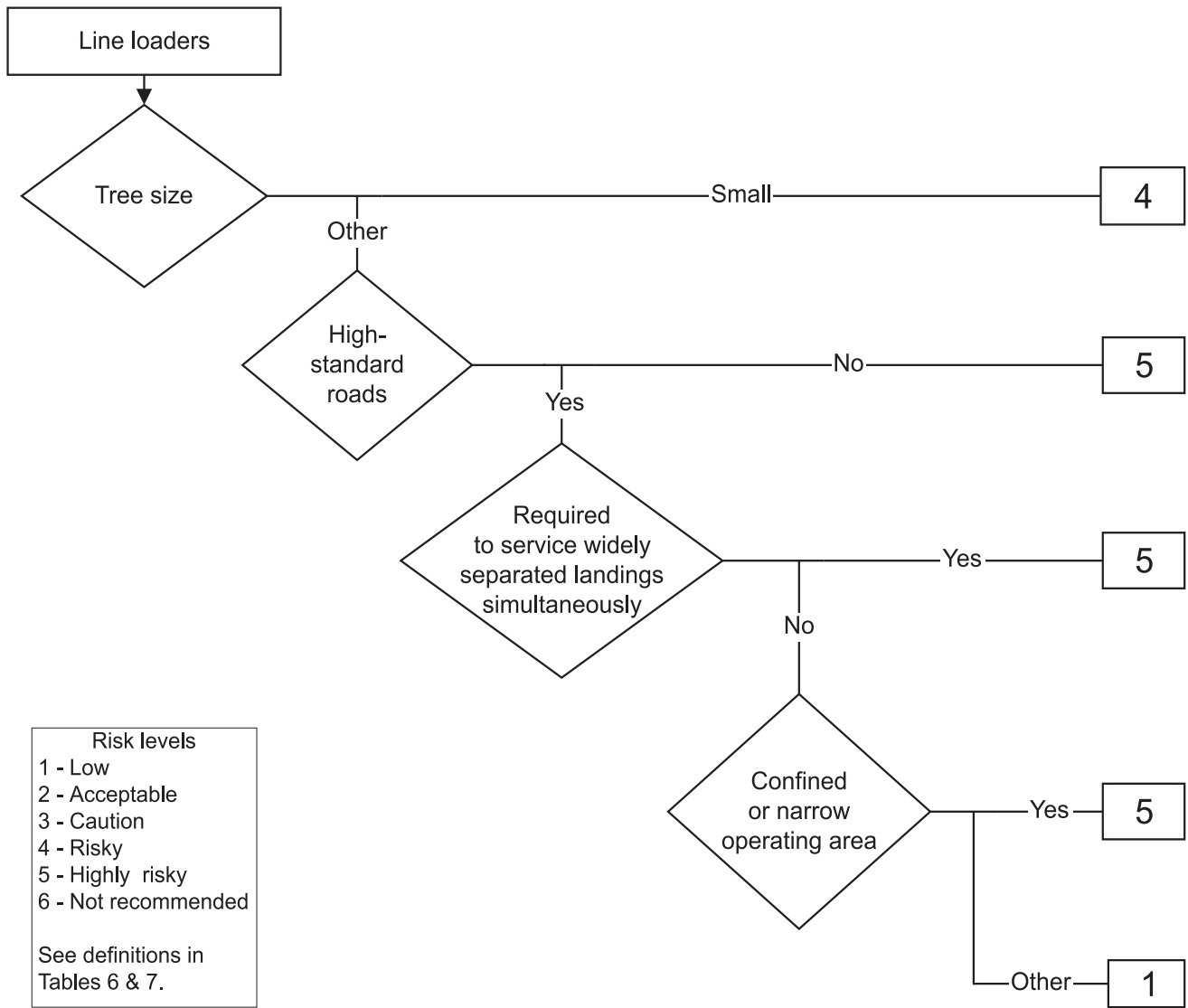


Chart 26. Line loaders.

- Line loaders can be moved relatively easily between loading sites up to several hundred metres apart, and are often used to service two towers simultaneously. Landings further apart pose difficulty for simultaneous operation because of low travel speeds, especially for track-mounted loaders. Low-bed transportation over longer distances is required. Rubber-mounted loaders can travel farther under their own power, but travel remains slow.