

## What Affects Skidder Productivity?

---

**Issue:** Tree-length timber harvesting produces timber through a series of steps performed using purpose-built machines. Each step must be balanced with those preceding or following it along the chain in order to maximize overall system efficiency. Changing site or weather conditions can influence the efficiency of any (or all) steps, but not always by the same amount, leading to imbalances and lost productivity in the harvesting process.



**Study Description:** Skidding seems to be the process most influenced by external or operational conditions. Other studies are examining how skidders are affected by site characteristics. The purpose of this study is to define how *operational* characteristics affect skidder, and overall system, efficiency. Skidders typically work in groups to supply trees to loaders and/or delimiters at fixed decks. Skidders can create congestion at decks when the amount of wood being delivered during any time period exceeds the capacity of the loader to store or handle it. Skidder operators choose their arrival times at the deck by picking a bundle to haul: the distance of the bundle from the deck determines, with some random variation, when the skidder will reach the deck. This study will determine how the pattern of choices of bundle distance can influence skidding productivity under various conditions, and define methods to alter haul patterns when conditions change.

**Status:** A simulation model of skidder operations has been developed. Initial results comparing effects of haul distance distribution and skidder bundle choice decision algorithms have been completed. Further simulation work is being done, and field work is being started to document haul distance patterns used by operators.

**Benefits:**

- *Higher utilization of skidding and loader capacity*
- *Recommendations for how to increase productivity of logging operations for varying timber/site conditions*

**Cooperators:** Biosystems and Industrial Engineering, Auburn University

**Contacts:** Tim McDonald

---

