

Biomass Harvest v2.2 LANDIS-II Extension User Guide

Robert M. Scheller¹

James B. Domingo²

¹Portland State University

²Green Code LLC

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1 Introduction

This document describes the Biomass Harvest Extension for the LANDIS-II model. Users should read the LANDIS-II Model User's Guide prior to reading this document.

The Biomass Harvest Extension for LANDIS-II is derived from the Base Harvest extension and therefore generally behaves the same as Base Harvest. The largest change is that Biomass Harvest supports partial thinning of cohorts; other changes are listed below. Consult the user guide for Base Harvest for further information.

Note: The Biomass Harvest Extension is *only compatible* with succession extensions that use the same cohort type, in this case cohorts with species, age, and aboveground biomass data. Currently, only the Biomass Succession extension meets this criterion. Therefore, Biomass Harvest is *not compatible* with either the Age-only or Century succession extensions.

1.1 What's New in Version 2.2

Ensured compatibility with different succession extensions

1.2 Major releases

1.2.1 Version 2.0.

Version 2.0 is compatible with LANDIS-II v6.0

1.3 Minor Releases

1.3.1 Version 2.3

July 1, 2014

Added compatibility with other succession extensions that inherit their cohorts from Biomass Cohorts through the new dependency on the Biomass Library. Any succession extension that uses a cohort structure that inherits from Biomass Cohorts should be able to be compatible with this version.

1.3.2 Version 2.2

March 30, 2014

The metadata library was incorporated. All outputs are now recorded in designated xml files with units, etc.

1.3.3 Version 2.1

March 5, 2013

Fixed a bug with partial harvesting when percentages < 100% were specified (issue #23).

1.3.4 Version 2.0

Biomass Harvest version 2.0 is compatible with LANDIS-II version 6.0.

1.3.5 Version 1.3

Version 1.3 incorporated the numerous fixes that were applied to the Base Harvest version 1.3.

1.4 Bug fixes

1.4.1 Version 2.0.4

Bug fixed regarding ages, age ranges, and partial removal percentages in the species list for cohort removals. In some cases the first or last species listed was not properly assigned to the prescription.

1.4.2 Version 2.0.3

Compatible with Base Harvest 2.1.2, which added capability for selecting a percentage of stands as the harvest target, and add potential for interaction with the Base BDA extension to allow presalvage prescriptions.

1.4.3 Version 2.0.2

Bug fixed that caused improper simulation of repeat harvests.

1.4.4 Version 1.3.1

The log files were changed to be more explicit about the biomass removed units, both in the output maps and the event log file. Output maps units are now **kg ha⁻¹**. Event log units are now **Mg biomass removed** and **Mg ha⁻¹** biomass removed per damaged site.

1.5 Extension Description

1.6 Acknowledgements

Funding for the development of LANDIS-II has been provided by the Northern Research Station (Rhinelander, Wisconsin) of the U.S. Forest Service.

2 Input Files

The inputs for this extension are identical to those listed in the Base Harvest User Guide with the exceptions listed below. The text file must comply with the general format requirements described in section 3.1 Text Input Files in the LANDIS-II Model User Guide.

2.1 LandisData

This parameter's value must be "Biomass Harvest".

2.2 PreventEstablishment

The user can use the PreventEstablishment keyword after the SiteSelection choice to indicate that no new cohorts can establish after this prescription has been applied to a site.

Example:

```
Prescription SmallDevelopments
  StandRanking      Random
  MinimumTimeSinceLastHarvest 0
  SiteSelection     PartialStandSpread 1 1
  PreventEstablishment
```

2.3 Species List for Cohort Removal

When SpeciesList is specified for the CohortsRemoved parameter in a prescription, the user may specify a percentage after any individual age or range of ages. The percentage indicates what proportion of a cohort(s) will be removed. For example:

```
CohortsRemoved SpeciesList
acersacc 1-40(50%) 50(65%) 65-70 71-107(15%)
```

The default percentage is 100%. If no parenthetical biomass removal values are given, the Biomass Harvest extension will behave identically to the Base Harvest extension.

2.4 Biomass Maps

The new BiomassMaps parameter comes after the PrescriptionMaps parameter.

The parameter specifies the template for the names of output maps of biomass removed from harvested sites. Like the `PrescriptionMaps` parameter, the `BiomassMaps` parameter requires that the `timestep` variable be used in its value:

```
BiomassMaps harvest/biomass-removed-{timestep}.img
```

This parameter is optional. If it is not present, then no output maps are created.