

# LANDIS-II Biomass by Age Output v2.1 Extension User Guide

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# 1 Introduction

This document describes the **Biomass by Age Output** extension for the LANDIS-II model. Readers should read the *LANDIS-II Model User Guide* prior to reading this document.

The Biomass by Age output extension was designed to group biomass data into age classes and output these data as maps. By allowing species biomass to be more finely partitioned than the total, the user can essentially combine age and biomass information. Such data may be particularly important when evaluating the quality of wildlife habitat. Some species may only benefit from the existence of a given tree species if the tree species is present as older cohorts. For example, many species need cavity nesting sites, e.g., spotted owl, and this extension would allow the user to track the spatial distribution and density (aboveground biomass) of older cohorts of the appropriate species.

The units for the outputs are **g biomass m<sup>-2</sup>**.

## 1.1 Major Versions

### 1.1.1 Version 2.1 (September 2016)

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

### 1.1.2 Version 2.0

Biomass by Age Output is compatible with LANDIS-II v6.0.

## 1.2 Minor Versions

## 1.3 Acknowledgements

Funding for the development of this extension was provided by USDA Forest Service, Pacific Southwest Region.

## 2 Input File

The input parameters for this extension are specified in one input file. This 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

The first parameter is the title of the input file:

```
LandisData "Output Biomass-by-Age"
```

### 2.2 Timestep

The second parameter is the time step in years. For example:

```
Timestep 15
```

### 2.3 Map Name Template

The next parameter, MapNames, describes where output maps are placed and their format. The first portion lists the directory where the maps should be placed, relative the location of the scenario text file (e.g., `agemaps/`). The second portion includes three variables for creating file names. `{species}` will be replaced with the species name. `{ageclass}` will be replaced with the defined age-class name (see below). `{timestep}` will be replaced with the output time step. Other characters can be inserted as desired. A meaningful file extension (e.g., `.gis`) should also be included. For example:

```
MapNames output/{species}-{ageclass}-{timestep}.img
```

**Note: Biomass output maps are not compatible with the .gis map output type.**

### 2.4 Species List

Next is a species list of the desired species from which to create maps. There is a List parameter, `Species`, followed by a list of one to many species. Following each listed species name must be an age-class name and the corresponding cohort ages. The age-class name can be any combination of letter and numbers. The cohort ages are in parentheses and can be given as a range (50-75) or given a less than or greater than comparative (>150) (<25). They need not be mutually

exclusive. Currently, only the greater than (>) and less than (<) inequality comparatives are allowed within the input file (e.g., greater than or equal to, >=, will causes errors). Greater than (>) is implemented as greater than or equal to, whereas less than (<) is always less than. Ranges are treated as greater than or equal to the lower value of the range, and less than the upper value of the range.

**Note: The first species listed must be on the same line as the `Species` parameter.**

**Note: There CANNOT be any spaces between the age-class name and the open parentheses.**

For example:

```
Species    pinubank ageclass1(10-40) ageclass2(15-100)
           pinuresi ageclass(>200)
           pinustro ageclass(>250)
           poputrem ageclass1(<50)
```