LANDIS-II Age Reclass Output v2.1 Extension User Guide

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1 Introduction

This document describes the **Age Reclass Output** extension for the LANDIS-II model. For information about the model and its core concepts, see the *LANDIS-II Conceptual Model Description.*

This output extension uses cohort information at each site to classify every active site into a forest type defined by the user. A fuzzy algorithm is used whereby a dominance value is calculated for each species:

$$D_{Species} = MaximumAge_{Species} / Longevity_{Species} \times \mathrm{Re}\,classCoefficient_{Species}$$

Maximum age is the oldest cohort for that species for that site. The reclass coefficient is a user input value ($0.0 \leq RC \leq 1.0$).

Each forest type has an associated group of species. The species dominance values are summed for each forest type to which they are assigned. Some species may have a negative dominance for a given forest type, as determined by the user. A site is assigned to (given the value of) the forest type with the highest total dominance value.

Note: If the reclassification calculates equal values for more than one forest type (a tie), then the forest type listed first among equals will be assigned to that cell.

1.1 Map Codes

The forest types in each reclassification map are assigned map codes based on their order in the map definition. The first forest type is assigned map code 1, the second forest type is assigned map code 2, and so on.

If a site cannot be classified, or is un-forested, its map code is zero (0).

1.2 Major Versions

1.2.1 Version 2.1 (June 2017)

Added compatibility with the Metadata library. The Metadata Library outputs metadata for all model outputs, allowing compatibility with visualization tools.

1.2.2 Version 2.0

The extension was modified to be compatible with version 6.0 of the LANDIS-II model.

1.2.3 Version 1.1

Modifications so that the extension is compatible with version 5.1 of the LANDIS-II model.

1.3 Minor Versions

1.3.1 Version 2.0.1

Improved compatibility with version 6.0 of the LANDIS-II model.

1.4 Acknowledgements

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

This parameter's value must be " Output Age Reclass".

2.2 Timestep

This parameter is the extension's timestep. Value: integer > 0. Units: years.

2.3 Reclass Coefficients

This table contains the reclass coefficients for various species. Each row has the coefficient for one species.

2.3.1 Species Column

This column must be the name of a species defined in the species input file (see chapter 5 in the *LANDIS-II Model User Guide*). The names can be in any order. Not all the species have to be present; if a species is not present, its reclass coefficient is the default value of zero (0).

2.3.2 Reclass Coefficient

This parameter is the reclass coefficient for the species. Value: $0 \leq$ number ≤ 1.

2.4 Reclassification Maps

This section contains the definitions of the reclassification maps. The section starts with the name "ReclassMaps". Although the section may be empty (i.e., contain no definitions), in order for the extension to produce any reclassification maps, there has to be at least one definition in this section.

2.4.1 Reclass Map Name

The first data line in a reclassification map definition starts with a text parameter which is the map's name. The name is followed by a two-character symbol "->" (a hyphen and a greater-than sign). There must

be some whitespace (spaces or tabs) between the map's name and the symbol, and between the symbol and the first forest type.

2.4.2 Forest Types

A reclassification map definition has one or more forest types. The first forest type must be on the same line as the map's name. Each additional forest type must be on a separate line.

The forest type is a text parameter.

2.4.3 Forest Type's Species

A forest type has a list of one or more species that contribute to the dominance value of the forest type. If a species' name is preceded by a minus sign ("-"), then it is subtracted from the forest type's dominance value (there must be no whitespace between the minus sign and the species name). **Not all species need be included and a species may be listed in more than one forest type.**

2.5 MapFileNames

This file parameter is the template for the names of the reclassification maps. The parameter value must include the two variables "reclass-map-name" and "timestep" to ensure that the maps have unique names (see section 3.1.8.1 *Variables* in the *LANDIS-II Model User Guide*).

3 Example File

```
LandisData   "Output Age Reclass"

Timestep     10

>>           Reclass
>> Species   Coefficient
>> --------  -----------
   abiebals   0.5
   acerrubr   0.2
   acersacc   0.7
   betualle   0.6
   betupapy   0.2
   fraxamer   0.5
   piceglau   0.4
   pinubank   0.3
   pinuresi   0.5
   pinustro   0.7
   poputrem   0.2
   querelli   0.4
   querrubr   0.6
   thujocci   0.6
   tiliamer   0.5
   tsugcana   0.8


ReclassMaps

>> Map Name    Forest Type      Species
>> --------    -------------    -------
   reclass1 -> MapleHardwood    acersacc betualle abiebals acerrubr fraxamer
-pinubank
               NorthernPines    pinubank pinuresi pinustro
               Oaks             querelli querrubr
               OtherConifers    piceglau thujocci tsugcana
               Other            poputrem betupapy

   reclass2 -> "Maple Hardwood" acersacc betualle acerrubr fraxamer
               "Northern Pines" pinubank pinuresi pinustro
               "Other Conifers" piceglau thujocci tsugcana abiebals
               Other            poputrem betupapy querelli querrubr


MapFileNames   output/reclass/{reclass-map-name}-{timestep}.img
```