

# A Photographic Guide to Aging Snowy Owls From Hatching to Fledging

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## INTRODUCTION

Accurately aging nestlings is important in studying reproduction and development in owls. Aging young can clarify hatching dates and help track developmental chronology and survival. Snowy Owls (*Bubo scandiacus*) provide a unique opportunity to document nestling development due to their accessible ground nests and resiliency to human presence, allowing researchers to answer many questions about their life history. This document provides a comprehensive guide to development and aging through age-specific behaviors and morphological changes, aiding researchers in the field and adding to the pictorial documentation of this species.

## METHODS

The Owl Research Institute published mass growth rates and comprehensive descriptions of 8 stages of development in Snowy Owl nestlings in Utqiagvik, Alaska using data and observations from 225 nestlings.

Here we supplemented these findings with observations and photographs from a nest in 2022 to create a photographic and descriptive guide to aging pre-fledging Snowy Owls. We delineate 8 developmental stages, from pipping in the egg to fledging between 44-55 days.

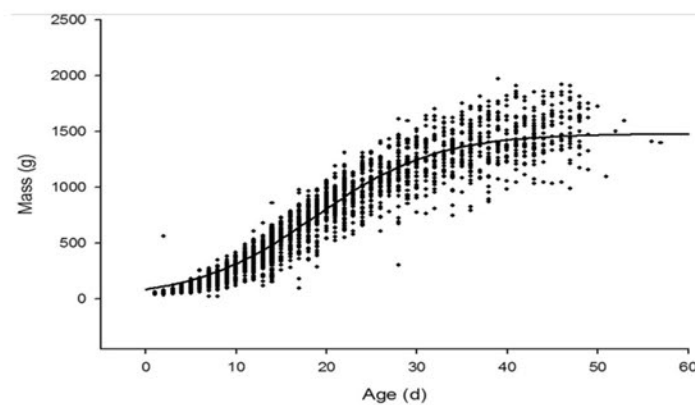


Figure 1. Fitted growth curves of mass versus age for Snowy Owl nestlings, 1993 and 1995

## RESULTS

### STAGE ONE: Days 1 – 4



#### BEHAVIOR:

- Movement very limited
- Vocalizations a soft twittering

#### MORPHOLOGY:

- White protoptile down, pink skin visible
- White egg tooth on black bill, light pink-gray cere
- Eyes sealed shut
- Whitish talons and pink, featherless metatarsal pads and feet



### STAGE TWO: Days 4 – 7



#### BEHAVIOR:

- Chicks helpless in nest with slight movement
- Vocalizations a soft twittering

#### MORPHOLOGY:

- Subcutaneous gray mesoptile down
- Egg tooth present, light pink-gray cere
- Eyes begin to slit open
- Featherless metatarsal pads and feet



### STAGE THREE: Days 8 – 14



#### BEHAVIOR:

- Can hold heads up
- May gular flutter and bill snap
- Food begging a loud, long scream

#### MORPHOLOGY:

- Eyes open
- Mesoptile down begins to replace protoptile down
- Primary quills on wings emerge
- Uropygial gland is featherless and dark in color
- Legs and toes have white feathers



### STAGE FOUR: Days 15 – 21



#### BEHAVIOR:

- Very mobile in and immediately around nest
- Pre-fledging departure from nest begins

#### MORPHOLOGY:

- Primarily covered in mesoptile down
- Egg tooth disappears, cere darkens in color
- Primary flight feathers erupt from sheaths, tail feather quills visible
- Legs and feet more feathered
- Greatest surge in body mass prior to nest departure (see Figure 1)



### STAGE FIVE: Days 22 – 28



#### BEHAVIOR:

- Chicks have departed nest on foot
- Can walk and run

#### MORPHOLOGY:

- Eyes deeper yellow
- Mesoptile down darker gray and juvenile plumage emerges, showing white X around eyes
- Tail feather quills erupt, primary feathers continue to emerge from sheaths
- Feathers on legs and feet grow longer



### STAGE SIX: Days 29 – 35



#### BEHAVIOR:

- Defensive posture with wings outstretched when threatened

#### MORPHOLOGY:

- Flight feathers growing rapidly and synchronously, primary wing feathers and coverts show dark bars and spots
- Cere dark in color
- Feathers around eyes begin to look like white mask



### STAGE SEVEN: Days 36 – 43



#### BEHAVIOR:

- Chicks begin hopping, practicing flapping wings, and first attempts at flying

#### MORPHOLOGY:

- Flight feathers well developed, notable difference in plumage between males and females
- Gray down still retained on head, back, and breast
- Developed white mask around eyes



### STAGE EIGHT: Days 44 – 55



#### BEHAVIOR:

- Most chicks flying with variable skills
- Still depend on adults for food

#### MORPHOLOGY:

- Flight feathers fully developed
- Juvenile plumage replaces down
- Last down replaced is on head



## CONCLUSIONS

Most field researchers studying breeding Snowy Owls visit nests intermittently or find them partway through the nesting process. Understanding proper aging techniques of nestling raptors is important for determining growth, reproduction, and nest success, as well as minimizes time of disturbance at the nest. This guide will aid researchers in the field in accurately aging pre-fledged Snowy Owls for research, monitoring, and conservation of this species.

## REFERENCES

Holt, D.W. et al. (2016). Mass growth rates, plumage development, and related behaviors of Snowy Owl (*Bubo scandiacus*) chicks. *Journal of Raptor Research*. 50(2):131-143

