

Marbled Murrelet Plumage Transition Guide



Kristin Lazarus
WDFW Biologist

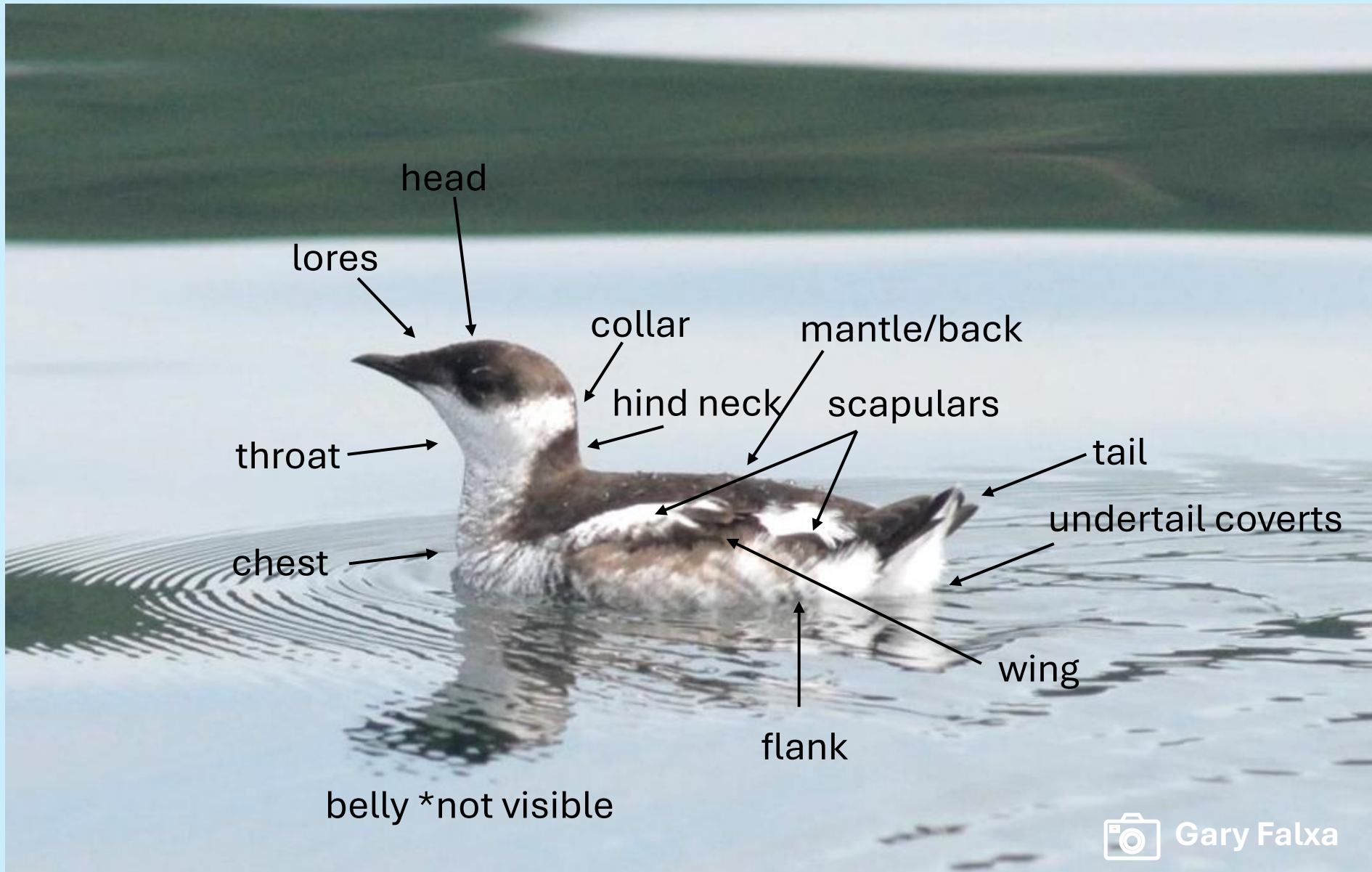


Scott Pearson

Vocabulary definitions

- **Adult breeding** = Birds greater than 1 year old that exhibit mottled brown plumage (**definitive alternate plumage**). Primarily observed April – September.
- **Adult non-breeding** = Birds greater than 1 year old that exhibit black and white plumage (**definitive basic plumage**). Primarily observed in September – March.
- **Juvenile** = Birds less than 1 year old. Coloration is similar to adult non-breeding with subtle differences that are explained in this guide. Primarily observed July – October.
- **At-Sea Surveys** = At-Sea Marbled Murrelet Monitoring Surveys
- **Marbled murrelet** = “murrelets” in this guide

Feathers used to describe murrelet plumage



Plumage class guide

CLASS 1 - Very little or no molt. Entirely in alternate plumage (breeding plumage); bird appears brown.

CLASS 2 - Obvious body molt but less than 50% of alternate plumage lost or replaced. Chest and neck obviously lighter than back.

CLASS 3 - Over 50% of alternate plumage lost or replaced, but still clearly distinguishable from juvenile birds by brown alternate plumage feathers on back, breast, and belly. Molting birds placed in this class if throat and neck appeared whitish overall.

CLASS 4 - Appears to be in basic plumage (black and white) from a distance. Birds in this class require closer examination to distinguish between juvenile and adult murrelets.

CLASS 5 - Confirmed juvenile bird – black and white coloration (basic plumage).

CLASS 6 - Unknown age – juvenile or adult can't be reliably determined. Black and white bird, in basic plumage (non-breeding).

CLASS 7 - Plumage classification cannot be determined (inadequate viewing time, etc.)

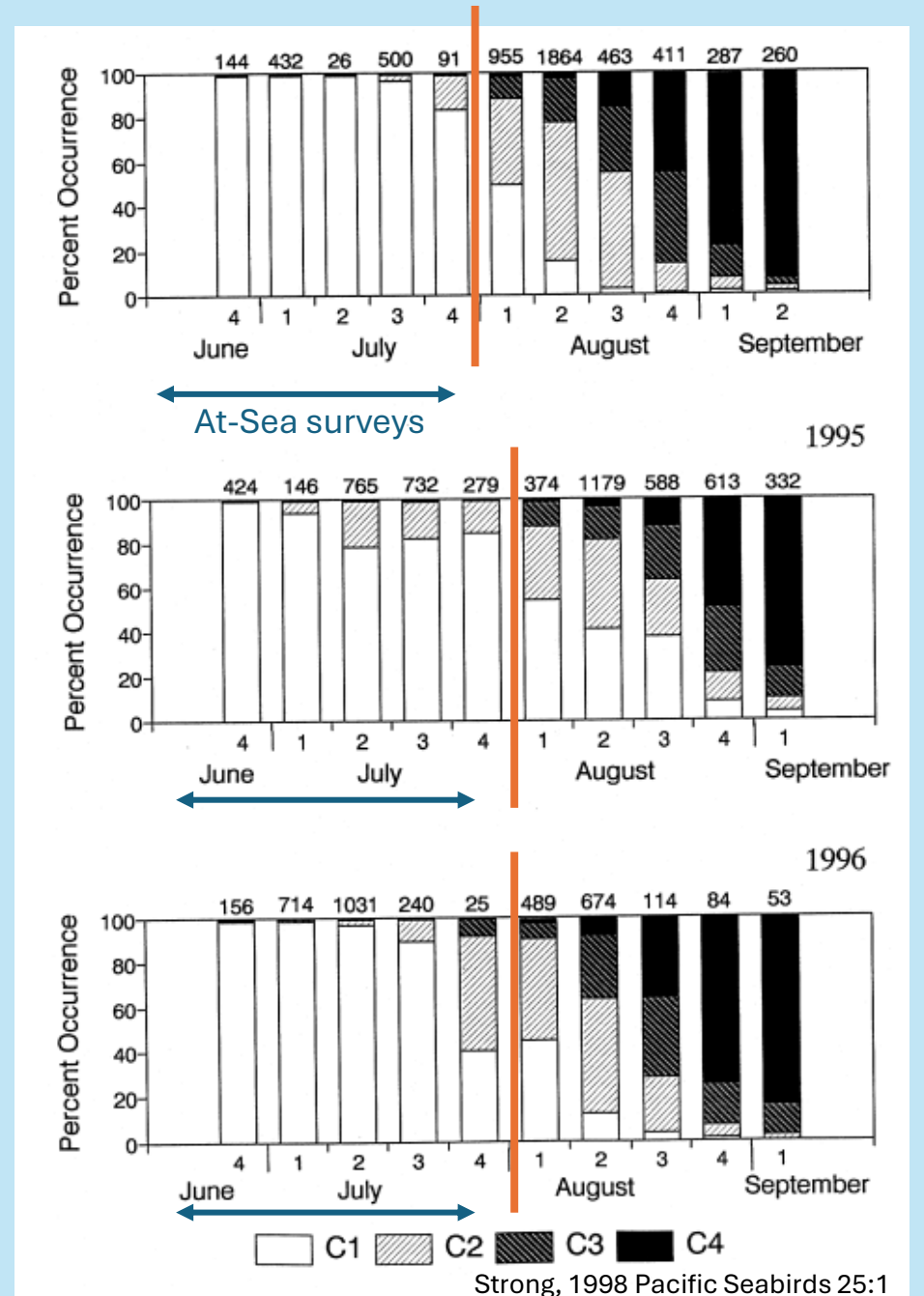
Why study plumage class?

- Informs murrelet phenology
 - Breeding season may shift
 - Fledging timing and location may shift
- Ratio of juvenile to adult birds has been used as a productivity index for murrelets



Temporal frequency of marbled murrelet molt classes

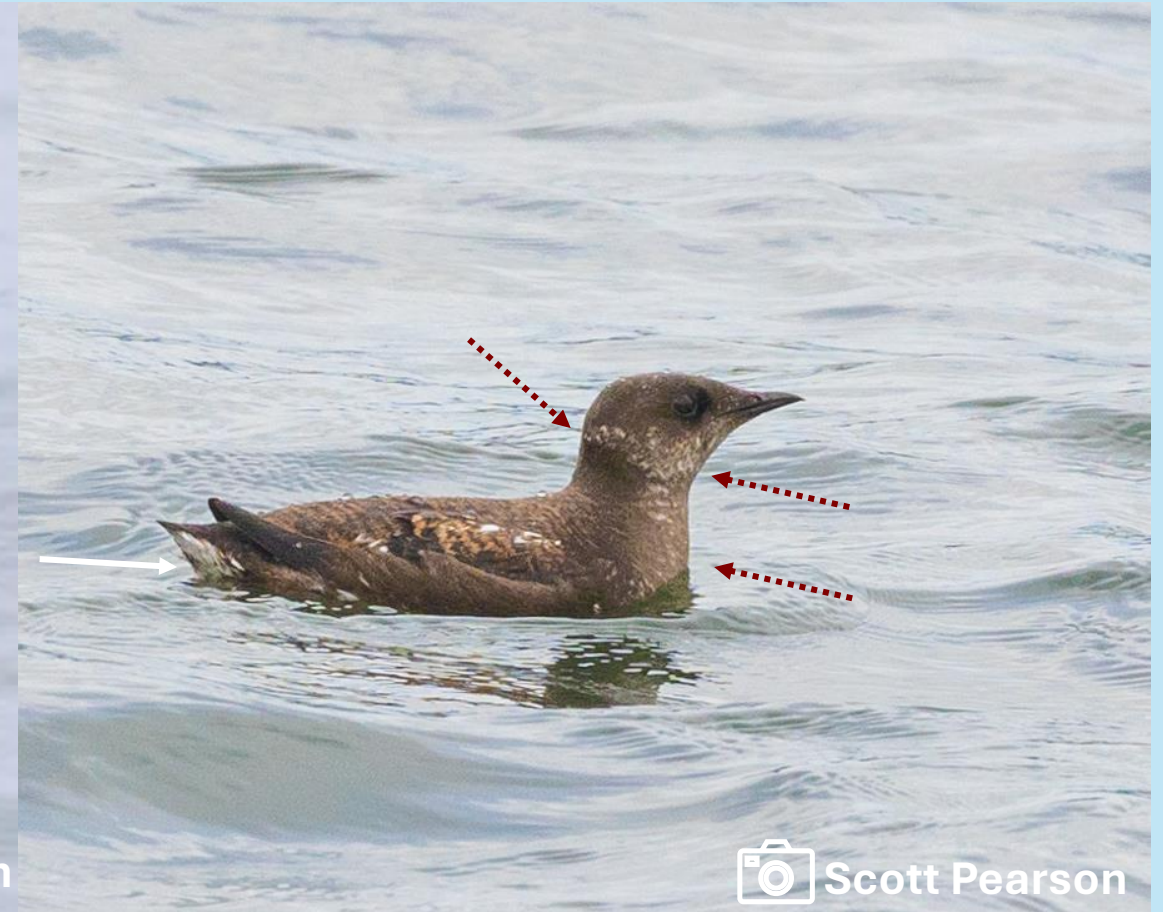
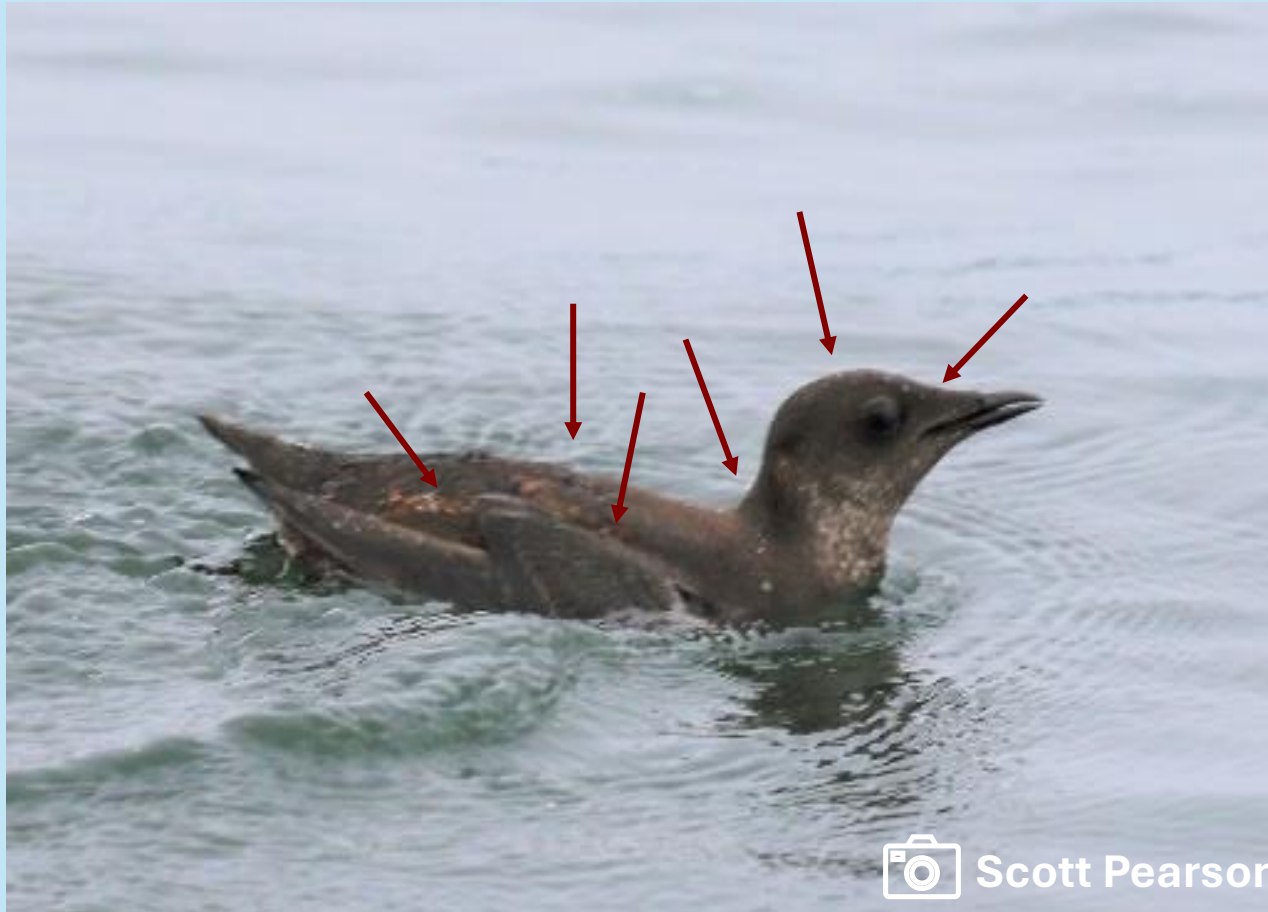
- Breeding season at-sea surveys take place between 15 May and 31 July (see blue arrows on figure)
- During the survey window we generally only see early molt birds (Class 1 – 3)



CLASS 1

Very little or no molt. Entirely in alternate plumage (breeding plumage); bird appears brown.

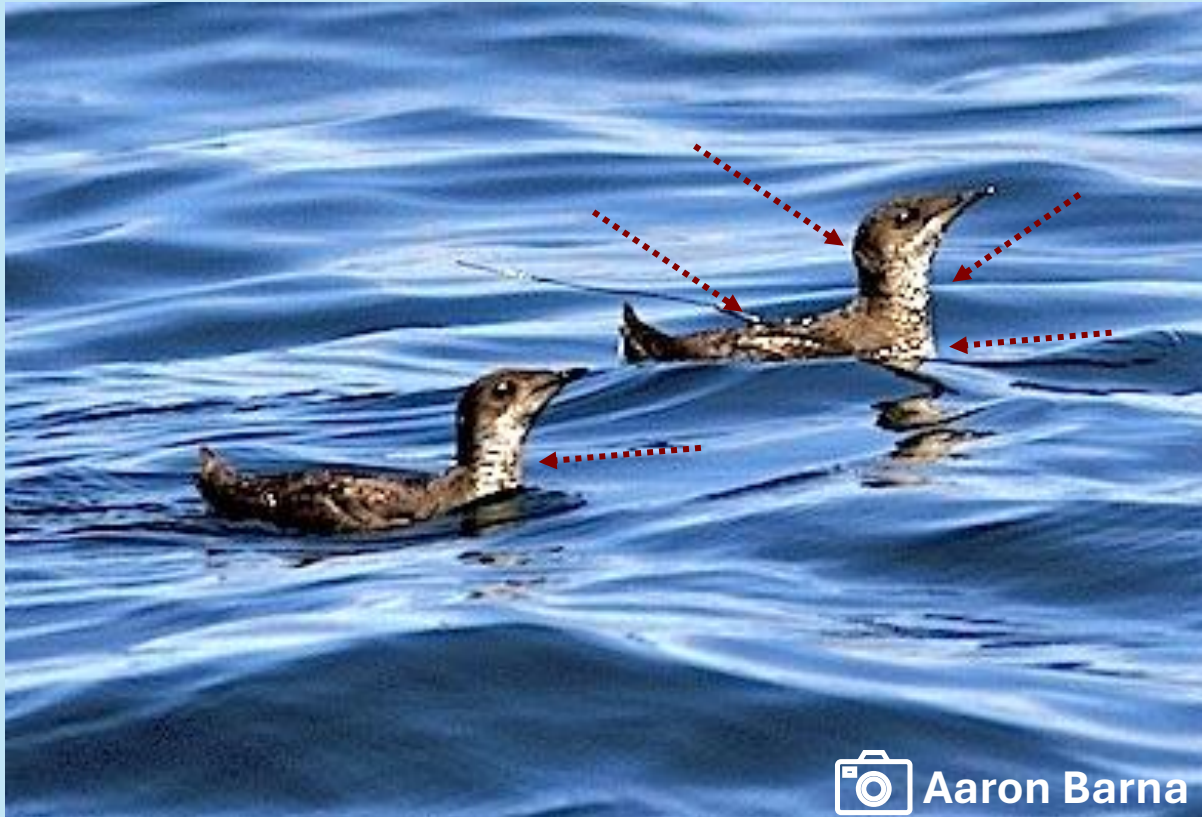
- Head, hindneck, lores, back, and wings are dark brown while scapulars can be rusty brown (brown arrows).
- Marbled brown and white on throat, collar, chest, belly, and flank may be identifiable upon close inspection (dashed brown arrows). Undertail coverts are white (white arrow) for all plumage classes.



CLASS 2

Obvious body molt but estimated at less than 50% of alternate plumage lost or replaced. Chest and neck obviously lighter than back.

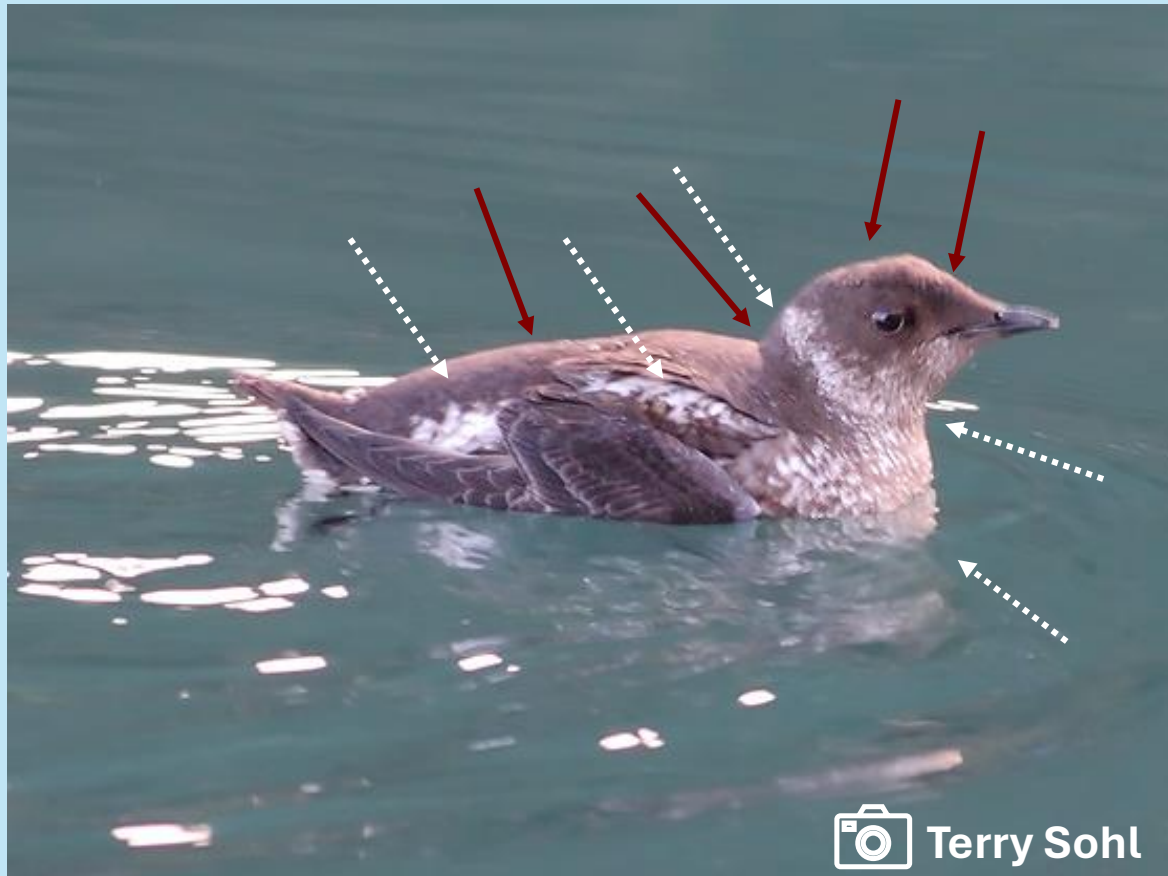
- Throat, chest, collar, and scapulars are mottled brown and white but white is becoming more distinct (brown dashed arrows). Undertail coverts are still white (white arrow).
- Head, hindneck, lores, back, and wings are still brown (brown arrows).



CLASS 3

Over 50% of alternate plumage lost or replaced, but still clearly distinguishable from juvenile birds by brown alternate plumage feathers on back, breast, and belly. Molting birds placed in this class if throat and neck appeared whitish overall in color.

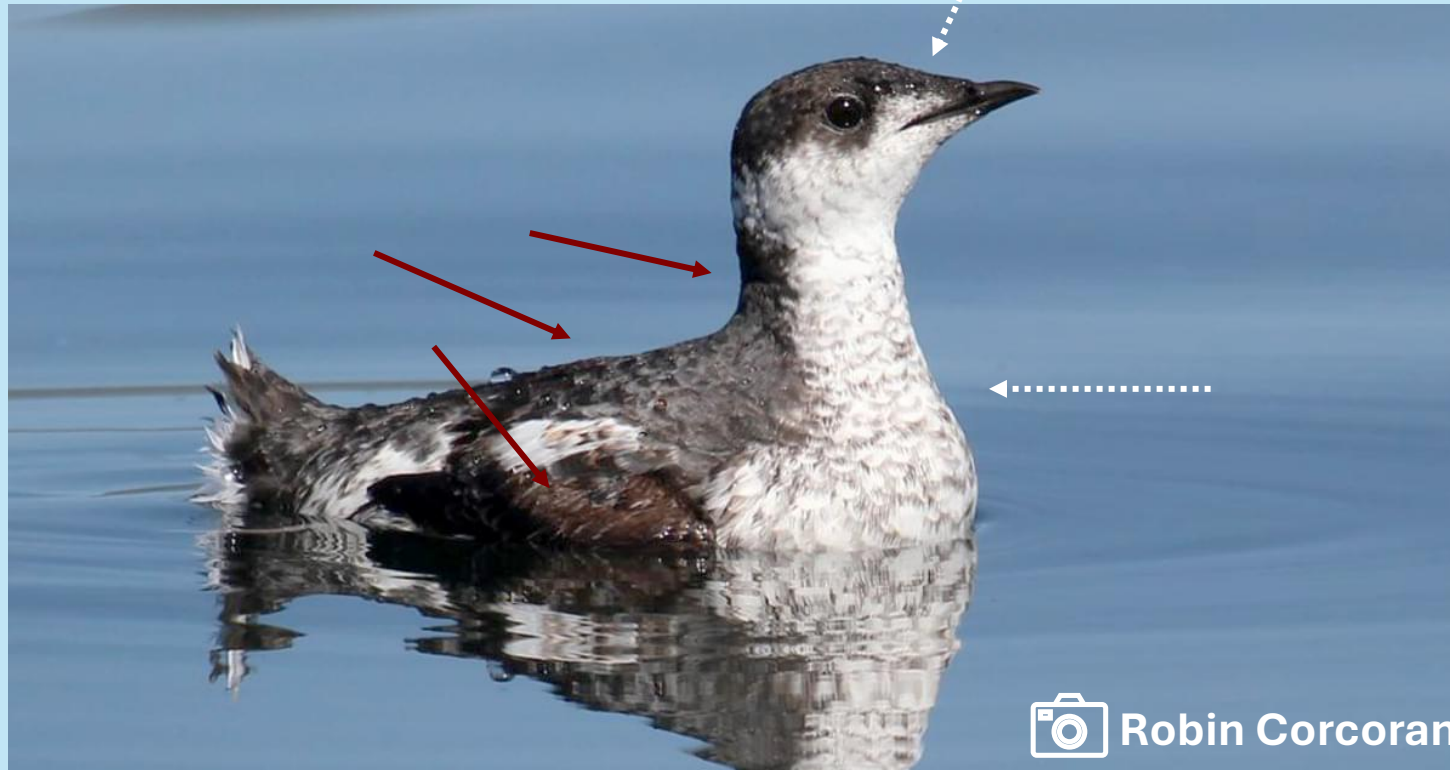
- Look for white molt in throat, chest, collar, scapulars, and flank (white dashed arrow). Neck and flank on Class 3 murrelets will look brighter white than those on Class 2 murrelets.
- Head, lores, hindneck, back, and wings are still brown (brown arrows).



CLASS 4

Appears to be in basic plumage (black and white) from a distance. Birds in this class require closer examination to distinguish between adult and juvenile murrelets.

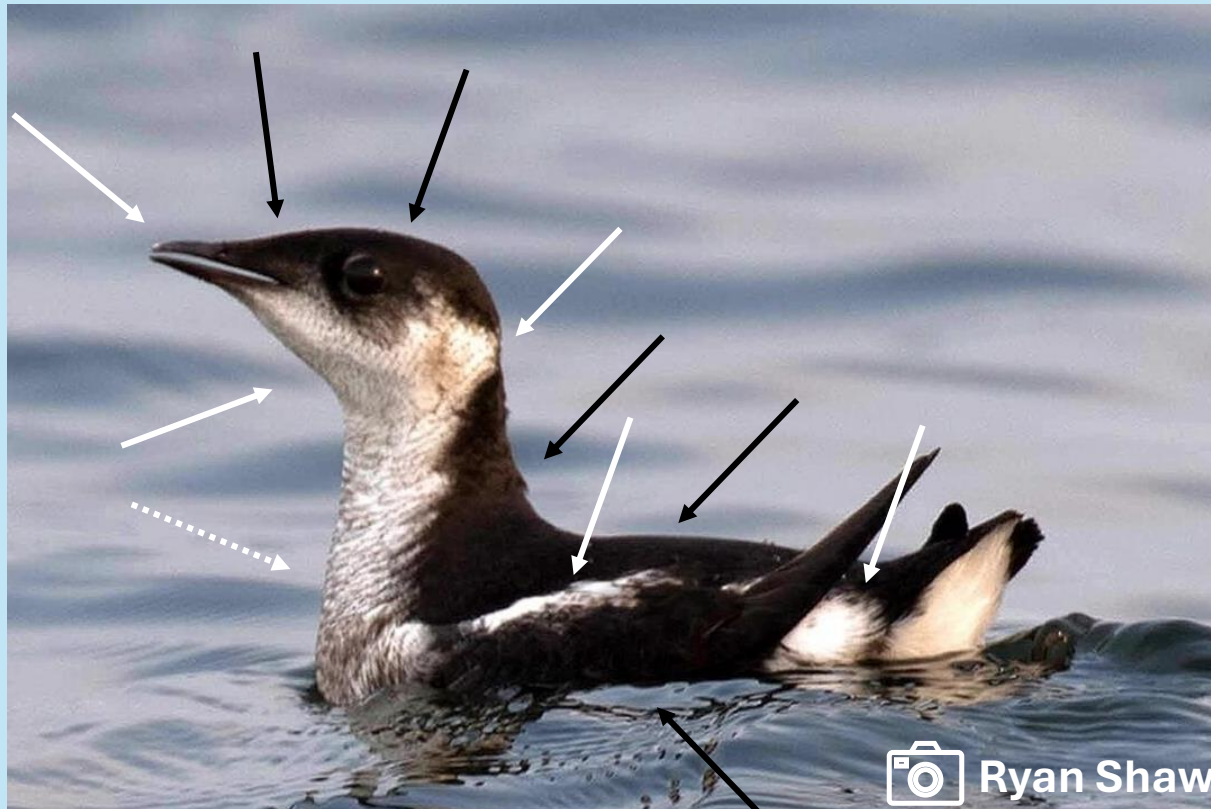
- Look for subtle brown feathers on back, hindneck, and wing (brown arrows).
- Wings may be stubby due to missing flight feathers in advanced molt.
- Brown and white marbled alternate feathers are on chest and belly (white dashed arrows).
- Lores are becoming whiter (white dashed arrows).



CLASS 5 – juvenile

Entirely in basic plumage – confirmed juvenile bird. No brown alternate plumage feathers on back, breast, and belly

- Juveniles often look sharp, and shiny black and white compared to adults who may have remnants of mottled brown breeding plumage. Juvenile lores are on average darker than adult birds in basic plumage (black arrow).
- Look for black head, hindneck, back, and wings (black arrows).
- Look for white throat, collar, scapulars, flanks, and belly (white arrows). Chest is white with wavy brown bands that are visible upon close inspection (white dashed arrow).
- Look for egg tooth on tip of beak (see white arrow). This may be visible on birds who have recently hatched.



Important behavioral clues:

Juvenile:

- Start 'panic dive' mode when approached by boat, with frequent short dives away from the boat.
- Paired with 1 -2 adult birds that they separate readily from.
- DO NOT flap after initial dive.
- The longer they have been at sea, the less likely they are to exhibit these behaviors

Adult:

- Are frequently paired and make an effort to remain paired (Vocalizing, swim / dive together).
- More reluctant to dive, preferring to swim away from boat.
- Frequently flap when emerging from a dive.

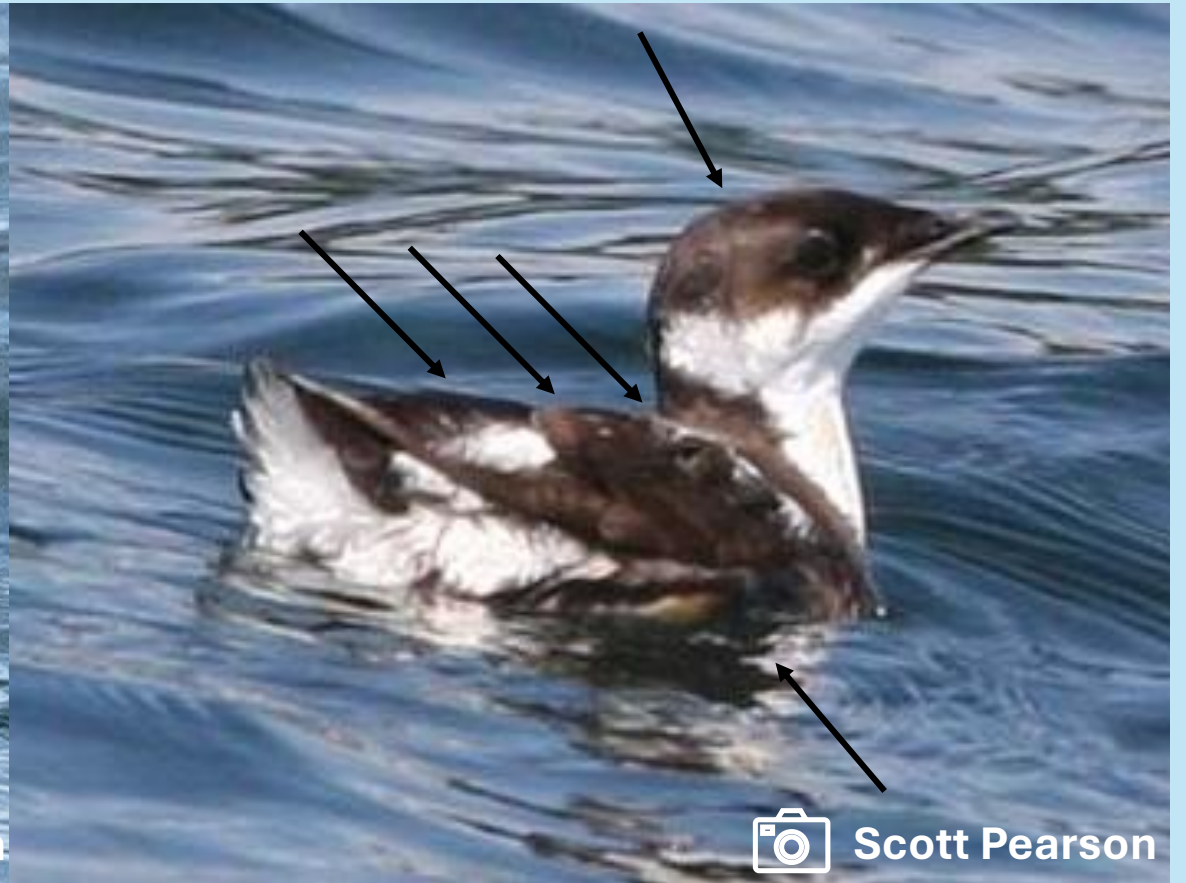
Seeing the above behaviors often requires pausing transect and following the subject bird(s); this may be difficult in a large boat.

Dichotomous Key for age determination of Marbled murrelets in the field

1a) Molt class 1-3	adult
1b) Molt class 4 (requires further examination)	2
2a) 'Scruffy' plumage, no sharp line between nape and neck, rust colored feathers present	adult
2b) Crisp black and white appearance	3
3a) Date before 7/25	juvenile
3b) Date after 7/25	4
4a) Egg tooth visible or fine, even flecking clearly seen on breast	juvenile
4b) Above features not seen	5
5a) Dark or blotchy abdomen seen in good light when bird dives	adult
5b) Abdomen and breast white or with fine fleck marks (rarely flecking is heavy, but always very even)	5
6a) Date before 08/10 and bird not strongly paired	juvenile
6b) Date on or after 08/10	7
7a) Primary wing molt apparent as gaps in wing outline or short, new primaries	adult
7b) Wing outline full when bird flaps	8
8a) Date before 08/25	juvenile
8b) Date after 08/25	9
9a) Bird strongly paired with another, maintain proximity throughout observation, vocalize if separated	adult
9b) Bird separates from group or is single. No vocalizations, makes many short evasive dives	juvenile

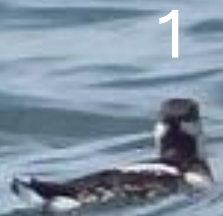
CLASS 6

- **Unknown age, black and white bird (juvenile or adult can not be reliably determined).**
- Look for white throat, chest, collar, scapulars, flank, and belly (white arrows).
- Look for black head, hindneck, back, and wing (black arrows).



Plumage Class Quiz

- **This quiz includes photos where marbled murrelets are between plumage classes and, consequently, may be identified differently by different observers**
- **The goal of this ID guide and quiz is to increase consistency in how we assign plumage classes**
- **Do your best to identify the plumage class in the following photos!**



4



5



6





10





11

12



14



13



15



16





17



18



19

20



21



22



23



Answers

1. 6	10.1	19.6
2. 6 *	11.1*	20.1
3. 6	12.1	21.5 *
4. 2 (almost a 3)	13.6	22.3 *
5. 1 *	14.6	23.2 *
6. 5 *	15.6	
7. 5*	16.6	
8. 5*	17.1	
9. 5*	18.5 *	

* = more observation time is encouraged to verify plumage class by seeing the bird from different angles and/or study the behavioral clues

Sources

Nelson, S. K. (2020). Marbled Murrelet (*Brachyramphus marmoratus*), version 1.0. In *Birds of the World* (A. F. Poole and F. B. Gill, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA.

Strong, C.S. (1998). Techniques for Marbled Murrelet age determination in the field. *Pacific Seabirds* 25(1):6-8.

Photographers

Scott Pearson, Craig Strong, Kelly Beach, Ryan Merrill, Gary Falxa, Aaron Barna, Robin Corcoran, Terry Sohl, Ryan Shaw, Eric Ellingson, Nicholas Metheny

Reviewers

Scott Pearson, Monique Lance, Craig Strong, Kelly Beach, Sarah Tanedo

