The Nature Conservancy

COLORADO FOREST RESTORATION INSTITUTE
COLORADO STATE UNIVERSITY

NEW MEXICO HIGHLANDS UNIVERSITY

Ponderosa Pine Seed Collection on the Colorado Front Range

Supplemental Information to Schloegel et al. 2024

https://cfri.colostate.edu/wp-content/uploads/sites/22/2024/07/Schlogel_etal_PonderosaPineSeedCollactionontheCOFrontRangeAFieldGuide_CFRI_2409.pdf

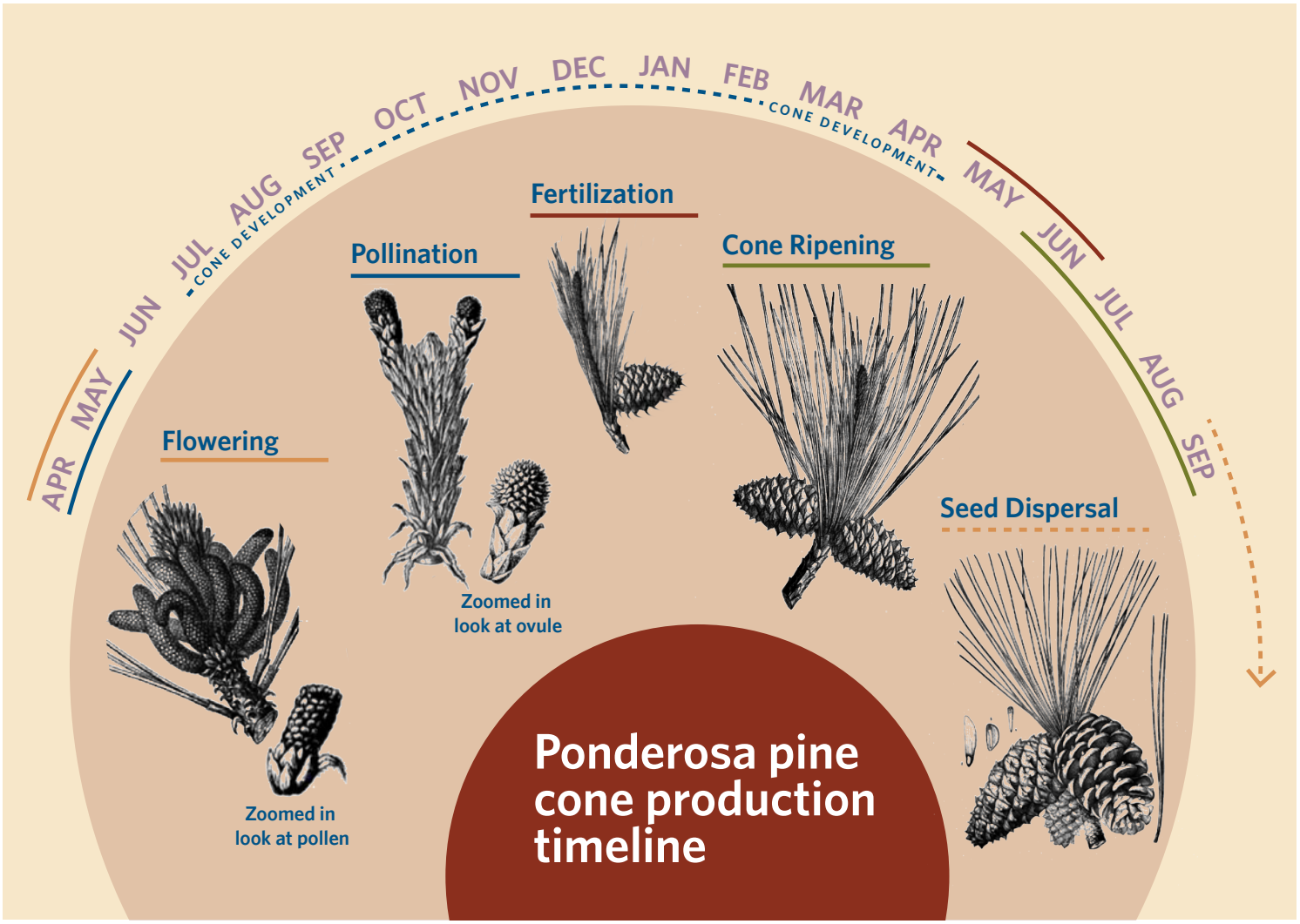

Figure 1. A timeline of ponderosa pine cone development from pollination to seed maturity. Portions of this figure are adapted from Sargent (1898). Source: A. Martinovich/The Nature Conservancy.

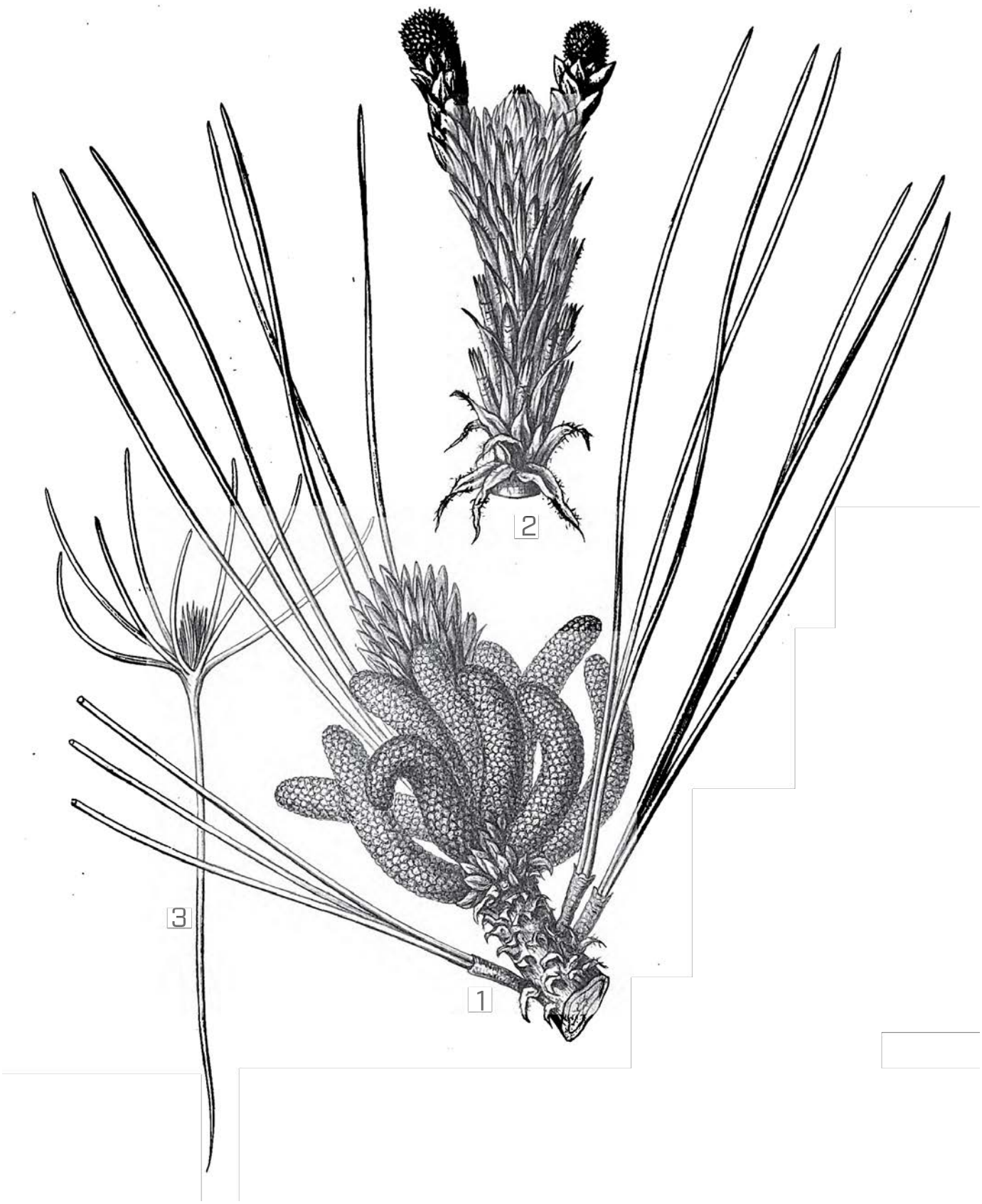

Figure 2. A drawing to scale of a male pollen sacs and a female ovule cone: 1) branch tip with male pollen sacs, 2) branch tip with female cones, and 3) a seedling plant (Sargent, 1898).

Figure 3. Photos of male pollen sacs and female ovule cone.

Male pollen cones (a-c) develop in early spring and are wind dispersed. Male pollen cones can be green to purplish as they develop (a-b) and are brown once mature (c).

Female ovule cones in year 1 in May/June (d-e), in August (f), and in year two in May (g).

Images: The Nature Conservancy, Colorado.

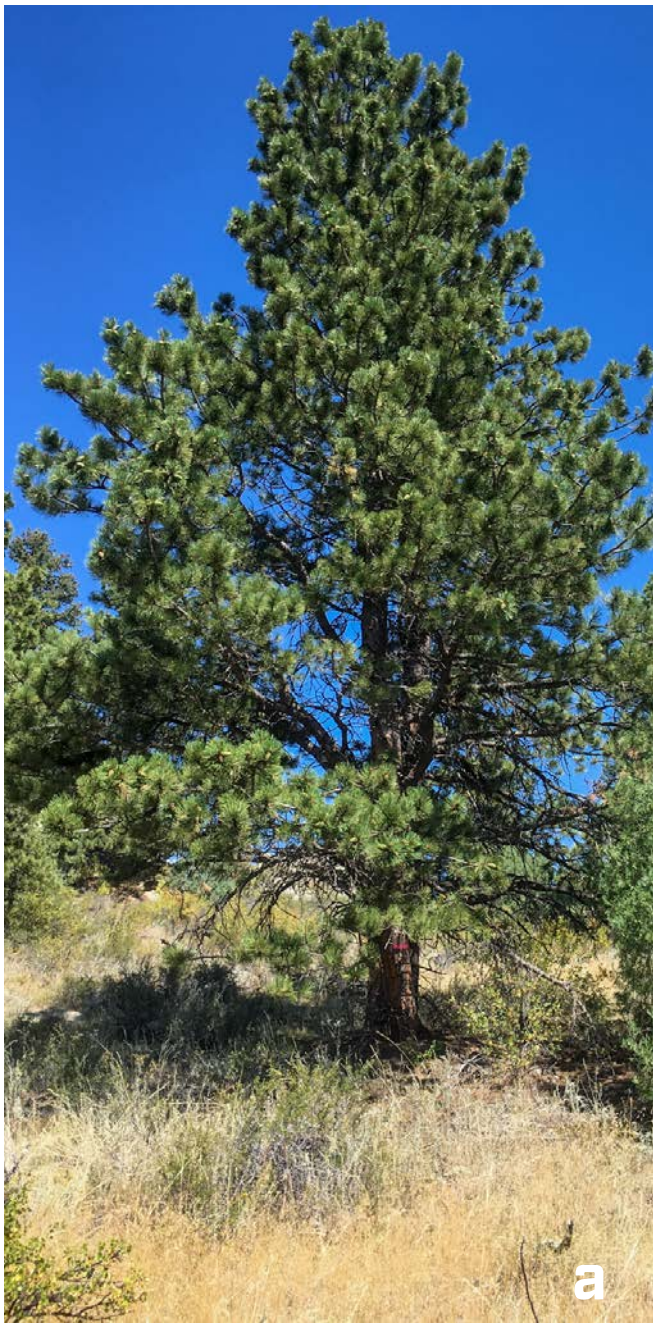

Figure 4. In a mast year (heavy), ponderosa pines will have 5-7 cones on each lateral bud (a and b), while in a non-mast year it will have 1-3 cones (c). Images: The Nature Conservancy, Colorado.

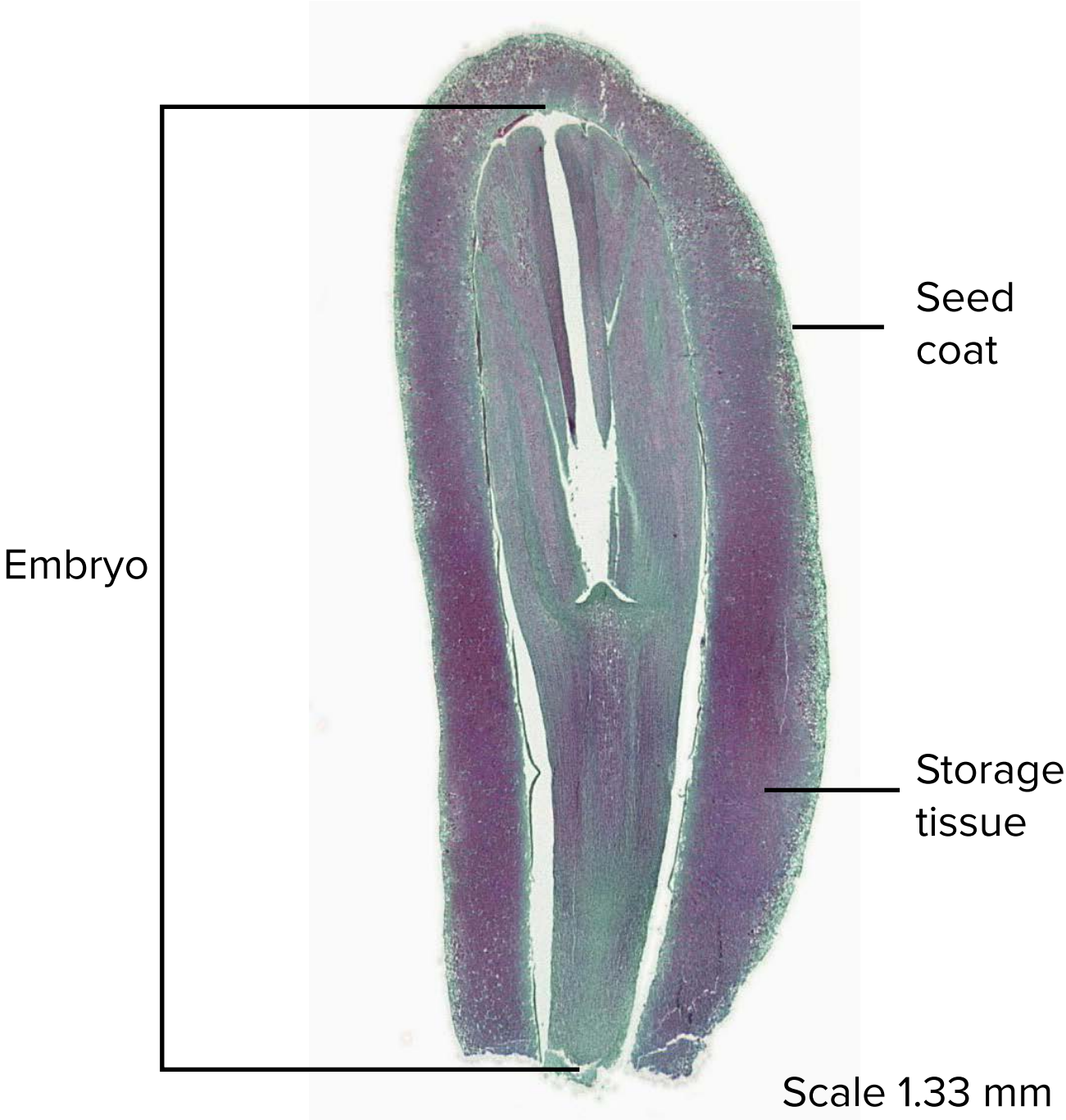

Figure 6. The seed has an embryo surrounded by tissue, the megagametophyte, which are encased inside a protective seed coat. Above, a mature pine seed with the embryo filling 90% of the cavity. Image: Jon Houseman and Matthew Ford via Wikimedia Commons (CC BY-SA https://creativecommons.org/licenses/by-sa/4.0/deed.en)

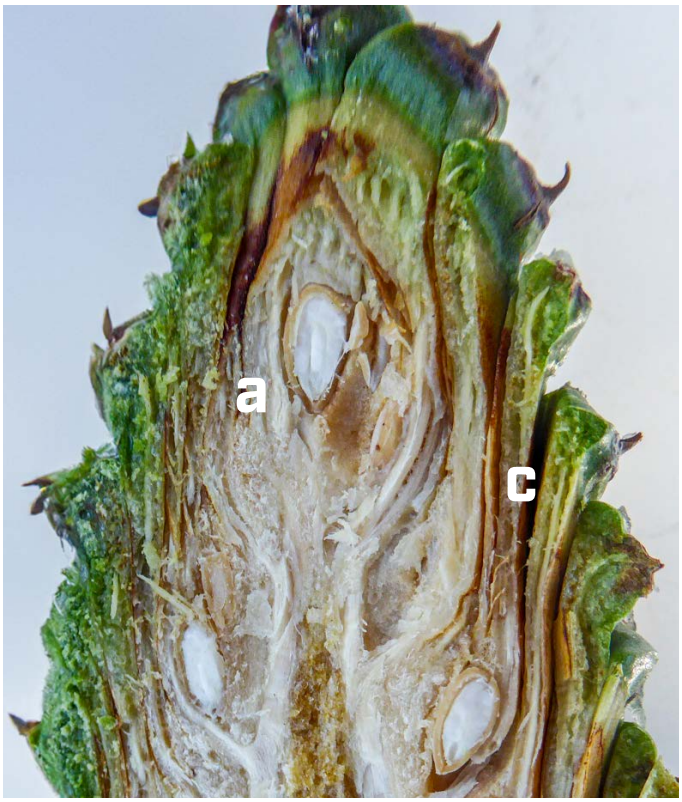

Figure 7. IImmature seeds where the embryo fills 70% of the megagametophyte (a), seedwing is translucent/clear (b), and cone shows slight flexing at scale margins (c). Images: The Nature Conservancy, Colorado.

Figure 8. Cone cut showing mature seed with embryo filling 90% of cavity (a) and dark seedwing and seed coat (b). Image: The Nature Conservancy, Colorado.

Figure 9. Examples of insect damage to cones and seeds. Images: The Nature Conservancy, Colorado.

CONE IDENTIFICATION TAG

Species: ______________________________

Seed zone: ______________________________

Elevation: ______________________________

Location: ______________________________

Date Collected: ______________________________

Cone Collector and organization:

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CONE IDENTIFICATION TAG

Species: ______________________________

Seed zone: ______________________________

Elevation: ______________________________

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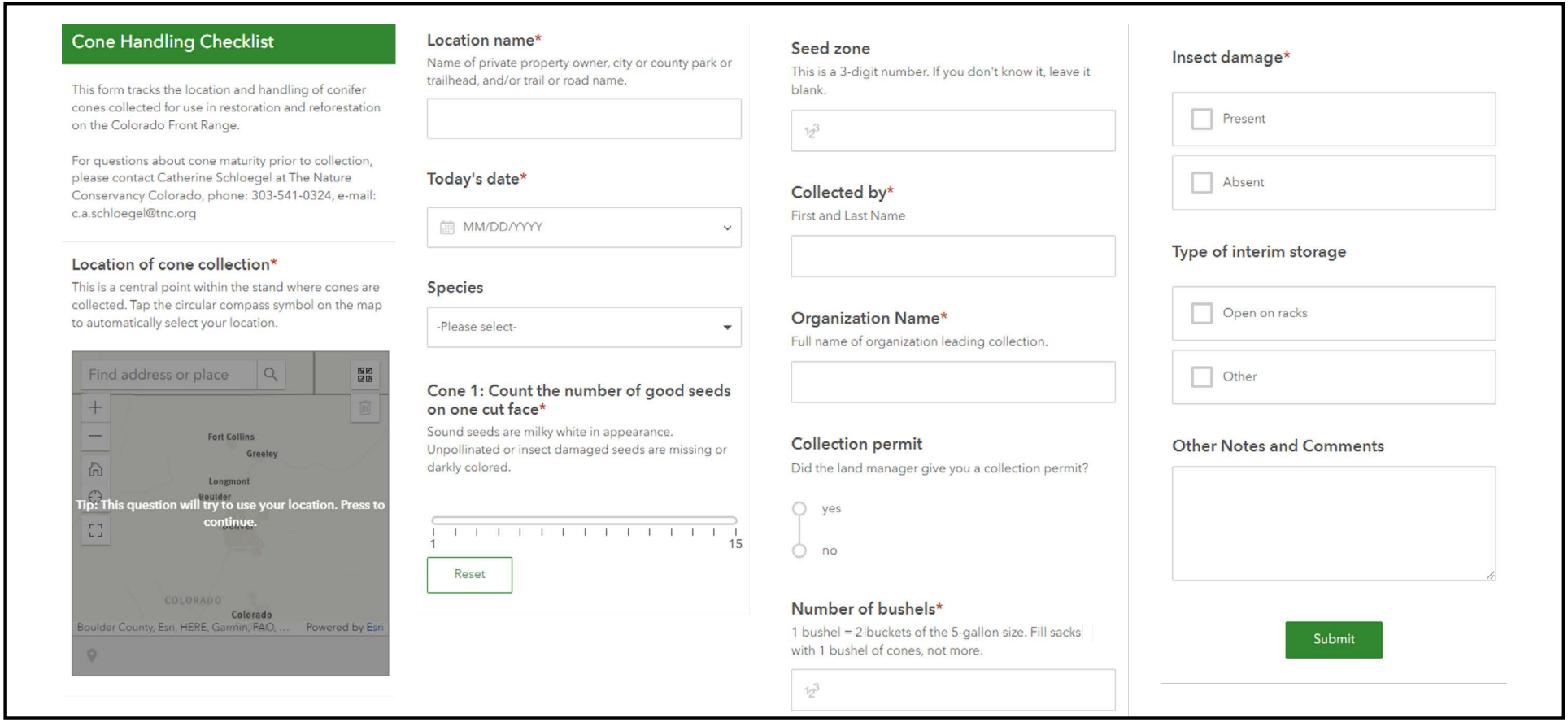

Figure 11. An example Survey 123 checklist to record the collection location, species, and other site-specific factors. A paper survey or other digital may also be used. Image: The Nature Conservancy, Colorado.