

*Unit 3:* Unit 3 consists of a cave and surrounding mesocaverns with suitable habitat for both cave animals. It was identified by Dr. Frank Howarth, an expert in this field, as important to maintaining the presence of these animals in this area. This unit contains at minimum two of the primary constituent elements and is one of only three sites west of Waikomo Stream. This unit adds to a wide distribution across the Koloa Basin which will protect the species from extinction from a single catastrophic event and therefore is essential to the conservation of the species.

*Unit 4:* Unit 4 consists of a cave with verified occurrences of both the amphipod and the spider and the surrounding mesocaverns. It is one of only six caves with a verified occurrence of the spider, and one of only seven verified occurrence of the amphipod. It contains at minimum two of the primary constituent elements, essential to the these species and which may require protection.

*Unit 5:* Unit 5 consists of a cave with verified occurrences of both the amphipod and the spider mapped by the Service and the surrounding mesocaverns. It is one of only seven verified occurrences of the amphipod, and one of only six verified occurrences for the spider. This unit contains three of the primary constituent elements essential to these species and which may require protection.

*Unit 6:* Unit 6 consists of a cave and surrounding mesocaverns identified in an archaeological survey and is likely to be occupied by one or both of the species. At this time, its occupancy status is unknown. This unit adds to the wide distribution across the Koloa Basin that will protect the species from extinction from a single catastrophic event and therefore is essential to the conservation of the species.

*Unit 7:* Unit 7 consists of a cave with a verified occurrence of the amphipod and surrounding available mesocaverns. It is one of only seven verified occurrences of the amphipod. This unit contains at minimum two of the primary constituent elements essential to the conservation of the species.

*Unit 8:* Unit 8 contains a lava tube identified through an archaeological survey and the surrounding mesocaverns associated with the tube. It is an area that is most likely to harbor the animals and contains at least two of the primary constituent elements. This unit adds to the wide distribution across the Koloa Basin that will protect the species from extinction from a single catastrophic event and therefore is

essential to the conservation of the species.

*Unit 9:* Unit 9 consists of a cave with the verified occurrence of the cave amphipod and surrounding available mesocaverns. It is only one of seven verified occurrences of the amphipod. It contains three of the primary constituent elements considered essential to the conservation of both species.

*Unit 10:* Unit 10 is located in the Koloa district, an area with cave-bearing rock containing an abundance of mesocaverns (small voids, cracks and passages). As previously discussed in the Background section of the rule, the Hawaiian basalt, found in this area, shrinks and cracks upon cooling creating the mesocaverns. In addition, this unit contains a cave that was used as a Civil Defense shelter. The entrance to the cave was sealed and has not been subsequently relocated. Therefore, the current occupancy status for these species is unknown. Although human use can detrimentally impact cave systems (see discussion under threats), they do not necessarily make the cave permanently unsuitable. For example, one of the cave systems included in critical habitat on Alexander and Baldwin (A&B) property (Unit 2) was also previously used as a civil defense shelter and is currently occupied by these species. Since the cave in Unit 10 was so large and long, it is unlikely that it has been completely filled in and the sealing of the entrance likely increased the humidity levels available in the cave. As discussed in the Cave Habitat section of the rule, cave systems for these species include one or more caves comprised of five zones (entrance, twilight, transition, dark and stagnant) and mesocaverns. While these mesocaverns can possess characteristics of each of the five zones, they frequently represent conditions of the stagnant zone. These mesocaverns are believed to provide refugia for these species when impacts make the caves uninhabitable for them. Unit 10 is believed to contain at least three PCEs (cave, mesocaverns, and appropriate microclimate [*i.e.*, high levels of humidity]). Information provided during the comment period (drilling records) show that the other areas surrounding Unit 10 have large deposits of clay or housing and other structures have been built in the area. The presence of clay and housing developments make it unlikely that additional areas adjacent to Unit 10 contain any remaining PCEs. Unit 10 is necessary to maintain continuity of the distribution of areas throughout the Koloa Basin making it essential to the conservation of the species.

*Unit 11:* Unit 11 consists of habitat that has been identified as an area most likely to be occupied by one or both of the species. The area within Unit 11 contains barren exposed rock, minimal prior surface disturbance, and minimal soil deposits, all of which provide higher quality caves and mesocaverns. This unit adds to the wide distribution across the Koloa Basin that will protect the species from extinction from a single catastrophic event and therefore is essential to the conservation of the species.

*Unit 12:* Unit 12 consists of habitat that has been identified as an area most likely to be occupied by one or both of the species. The area within Unit 12 contains barren exposed rock, minimal prior surface disturbance, and minimal soil deposits, all of which provide higher quality caves and mesocaverns. This unit adds to the wide distribution across the Koloa Basin that will protect the species from extinction from a single catastrophic event and therefore is essential to the conservation of the species.

*Unit 13:* Unit 13 consists of the only known occupied limestone cave and surrounding mesocaverns. The cave is occupied by both arthropods and is one of only seven verified locations of the amphipod, and one of six verified locations of the spider. This unit contains three of the primary constituent elements considered essential to the conservation of both species.

*Unit 14:* Unit 14 is composed of uplifted coral and algal reefs and consolidated calcareous deposits (MacDonald *et al.* 1960). Exposed basaltic flows are not believed to be present within this unit. This unit lies only a short distance (approximately 350 m (1,100 ft)) from Unit 13, which is occupied, and was likely once connected to that unit in the geologic past (Pleistocene Era) by deposits that have since eroded away or have been covered by unconsolidated sediments. It is not known if this unit is currently occupied by the Kauai cave wolf spider, Kauai cave amphipod, or other endemic troglobites.

Recent visits to this unit have found that the area is composed of exposed calcareous deposits containing cracks and solution pockets, which are indicative of the presence of underlying cave and mesocavern habitats. While accessible caves have not been located, air-passages, holes, and fissures visible above ground strongly suggest the presence of underlying caves or mesocaverns. Critical habitat is designated in this unit because of the cave-bearing nature of the geology, and