APPENDIX H

Upstream Passage and Spawning Habitat-Flow Relationships Derived for Validation Sites

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APPENDIX H
UPSTREAM PASSAGE AND SPAWNING HABITAT-FLOW
RELATIONSHIPS DERIVED FOR VALIDATION SITES

The following graphs depict the habitat-flow relationships calculated for each transect sampled in September 2006 at the 13 validation sites. For most sites, four transects were sampled, including two spawning transects and two passage transects. For some sites, only three (Santa Rosa Creek), two (Huichica Creek and Dry Creek Tributary), or one transect (EF Russian River Tributary) were sampled depending on site conditions and accessibility to representative locations. Results are presented for each validation site in order from smallest to largest drainage area.

Each of the lines in the graphs represent habitat calculated for a transect placed across either a restrictive (at low flow) upstream passage location, or across higher quality spawning habitat (typically located between the pool edge and riffle crest). Habitat is quantified as a suitable width. In some cases there was no habitat; this is indicated by lines missing in the graph for specific legend labels.

The graphs are stepped in increments of 2 feet, reflecting the discretization of the channel profile into 2-ft wide cells approximating the minimum width of steelhead and coho redds (for spawning), or of a suitable corridor width for adult upstream passage. The graphs should be interpreted as follows:

- Passage begins at the lowest flow that width becomes non-zero. In the analysis of protectiveness, the limiting upstream passage flow for the site is set equal to the transect requiring the highest initial passage flow.

- The "optimum" flow providing maximum spawning habitat availability on a transect occurs at the lowest flow at which the greatest amount of spawning habitat is available. This protocol is functionally equivalent to that used by Rantz (1964) and Swift (1976, 1979). In the analysis of protectiveness, the limiting optimum spawning flow for the site is set equal to the transect requiring the lowest optimum flow. This limiting optimum spawning flow is the flow used to determine the Upper MBF (MBF3) alternative as discussed in Section E.3.2.

- The flow providing marginally useable spawning habitat conditions on a transect, occurs at the lowest flow for which suitable width is non-zero. Flows below this level do not provide spawning habitat on the transect and are thus not protective at all. In the analysis of protectiveness, the limiting spawning flow for the site is set equal to the transect requiring the lowest flow for which suitable width is non-zero. This limiting spawning flow is the flow used to determine the Lower MBF (MBF4) alternative as discussed in Section E.3.3.
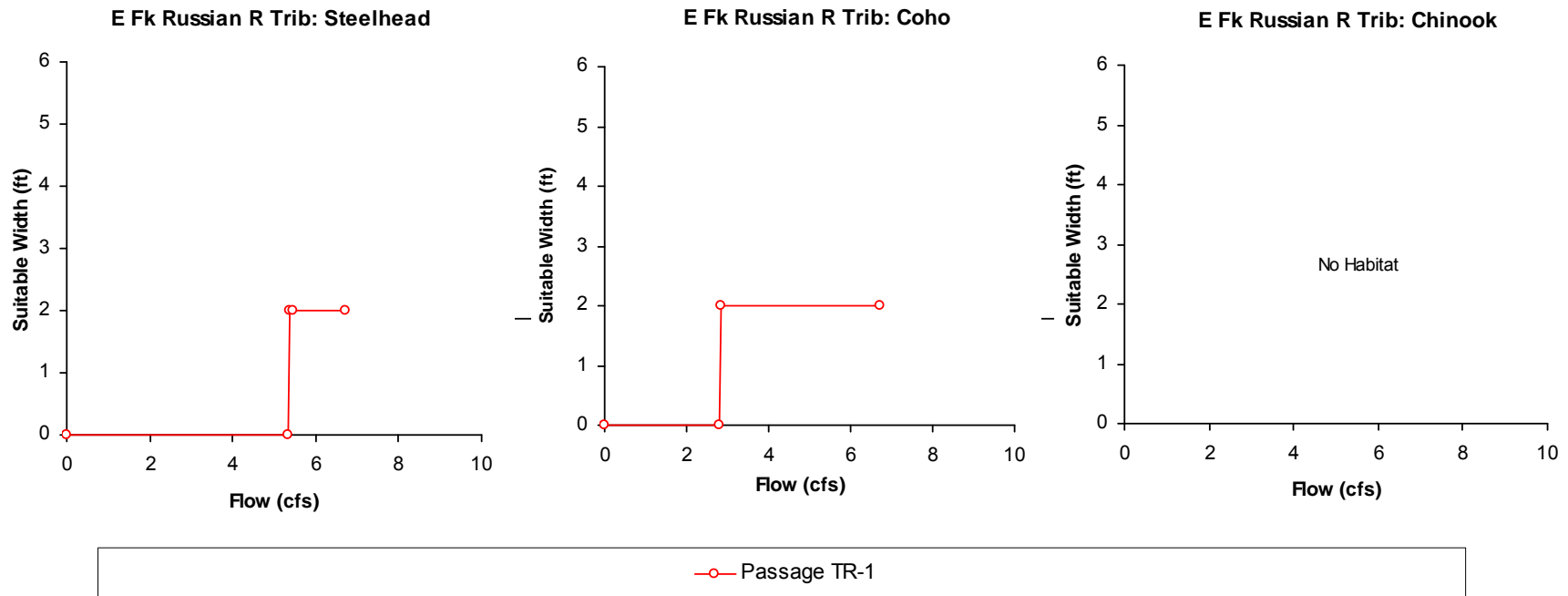
Figure H-1.   Habitat-flow curves calculated for the upstream passage transect sampled in the East Fork Russian River Tributary validation site. No spawning habitat transects available at this site.
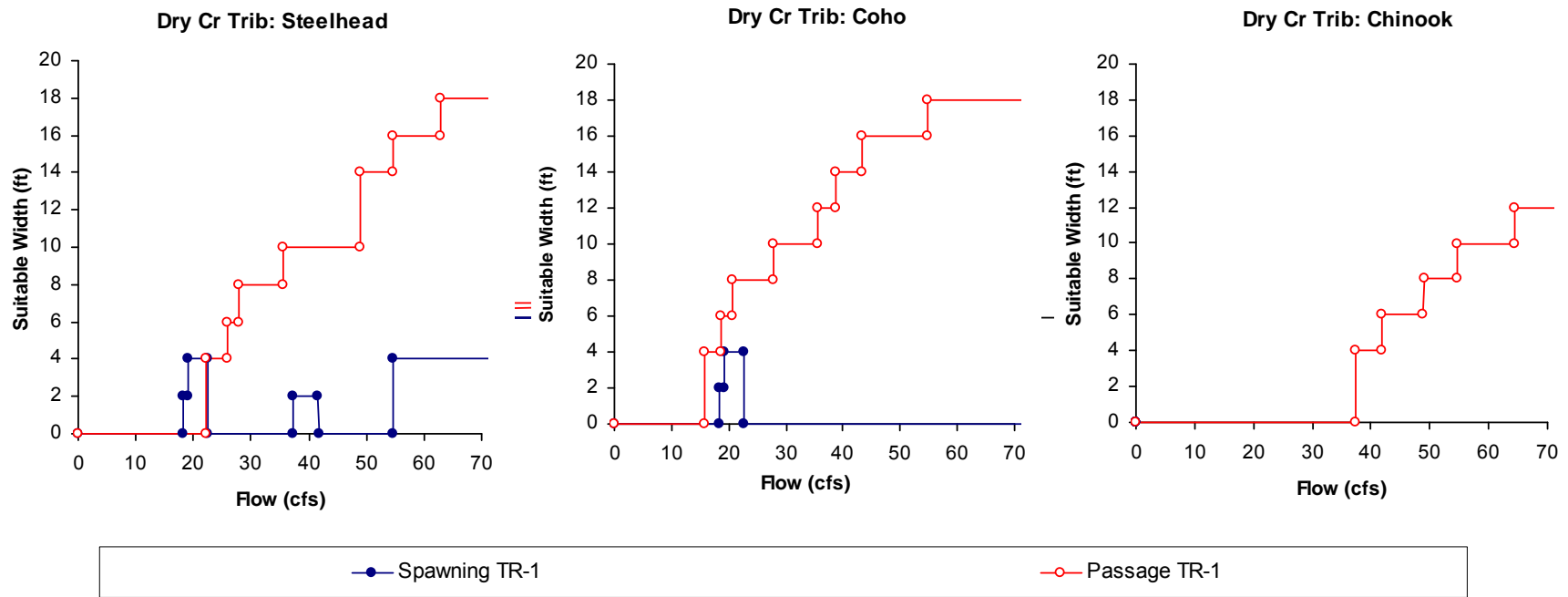
Figure H-2.   Habitat-flow curves calculated for the upstream passage and spawning transects sampled in the Dry Creek Tributary validation site.
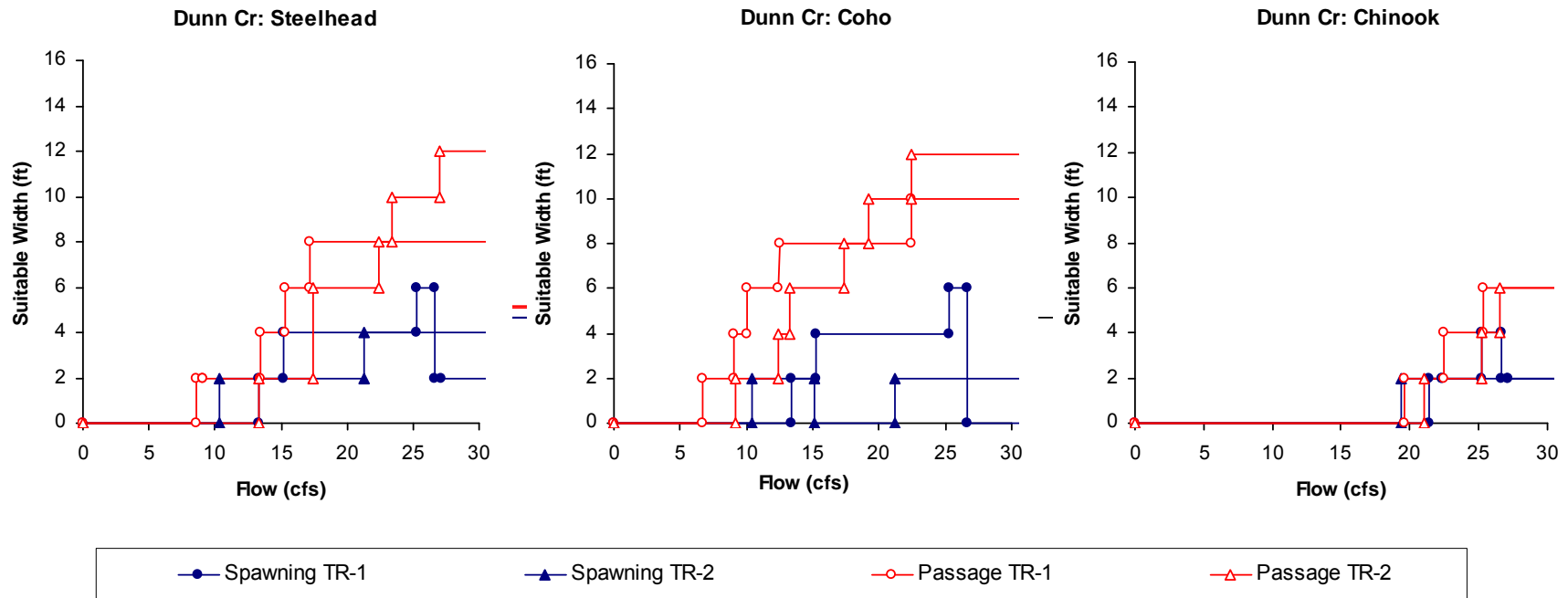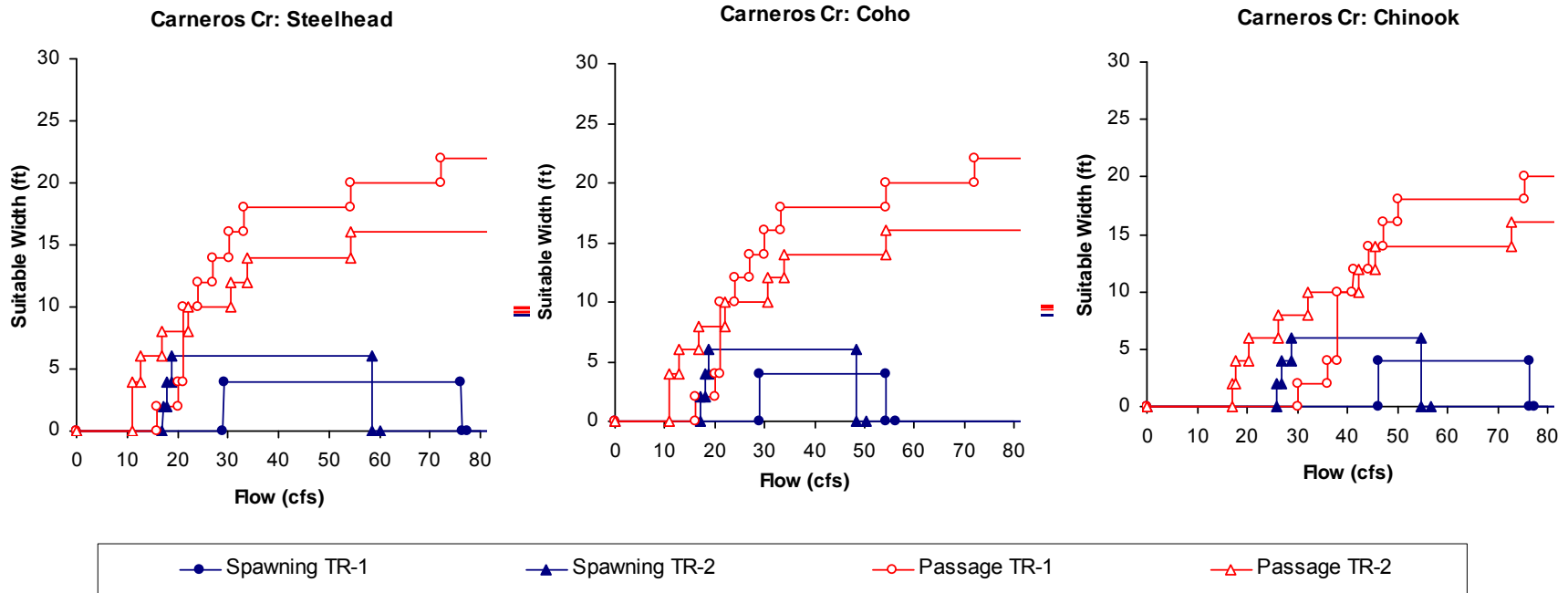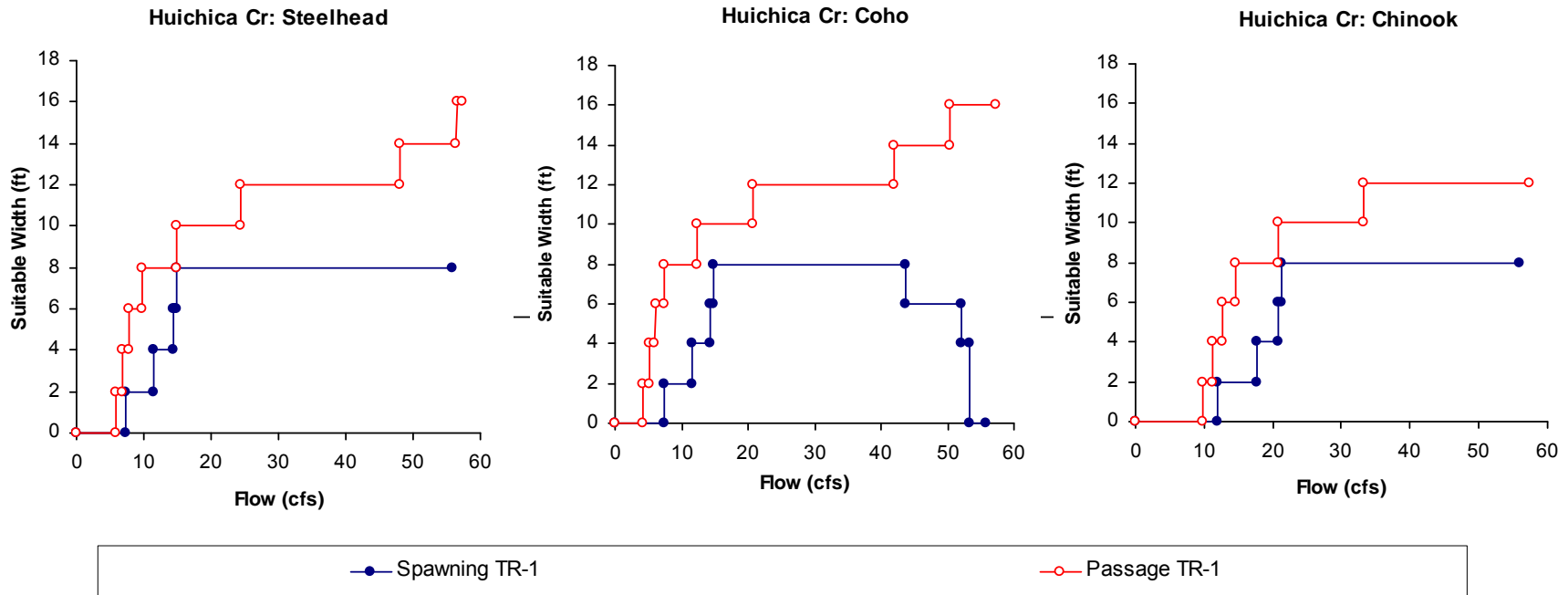
Figure H-3.   Habitat-flow curves calculated for the upstream passage and spawning transects sampled in the Dunn Creek Tributary validation site.

Figure H-4.   Habitat-flow curves calculated for upstream passage and spawning transects sampled in the Carneros Creek validation site.
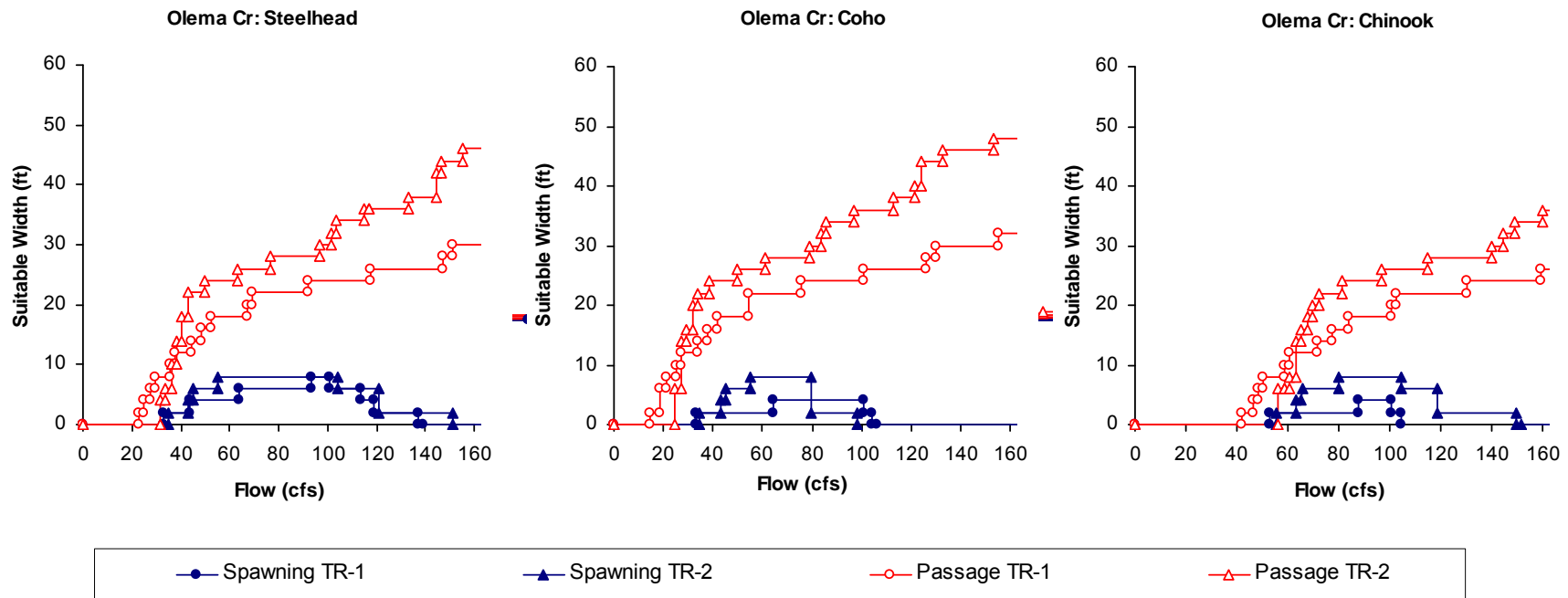
Figure H-5.   Habitat-flow curves calculated for upstream passage and spawning transects sampled in the Huichica Creek validation site.

Figure H-6.   Habitat-flow curves calculated for upstream passage and spawning transects sampled in the Olema Creek validation site.
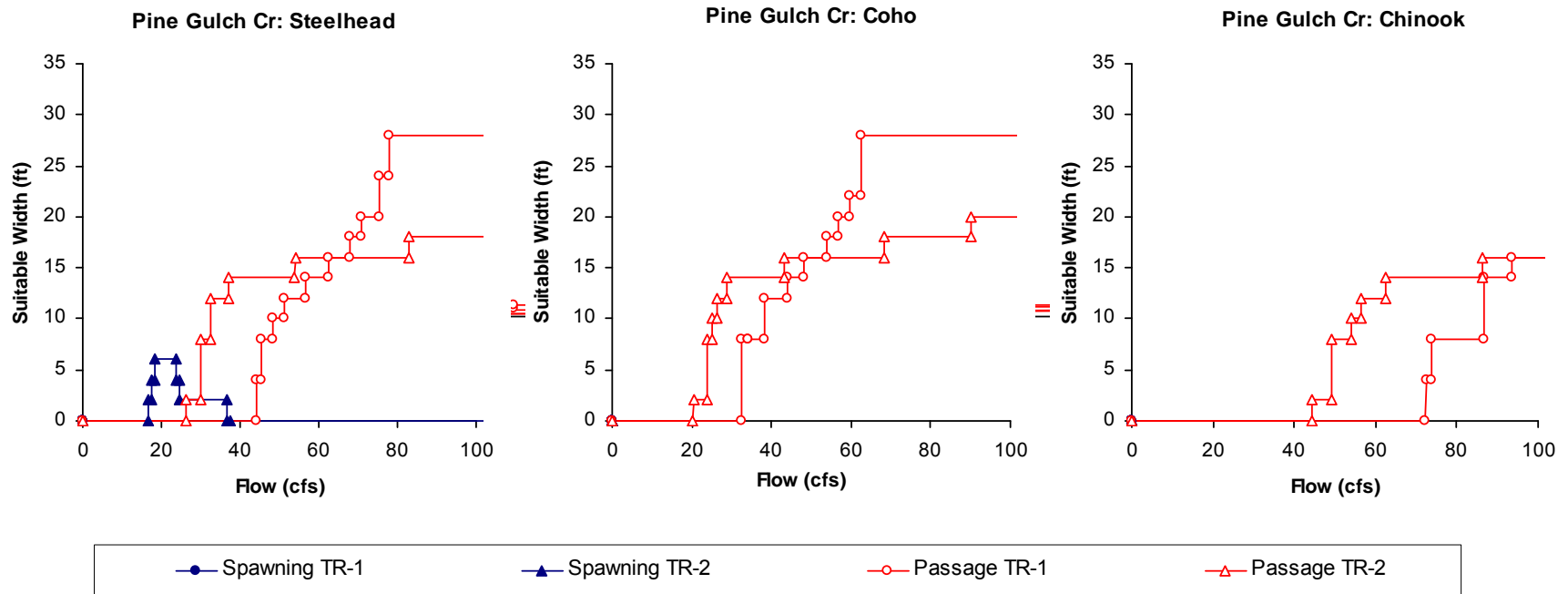
Figure H-7.   Habitat-flow curves calculated for upstream passage and spawning transects sampled in the Pine Gulch Creek validation site.
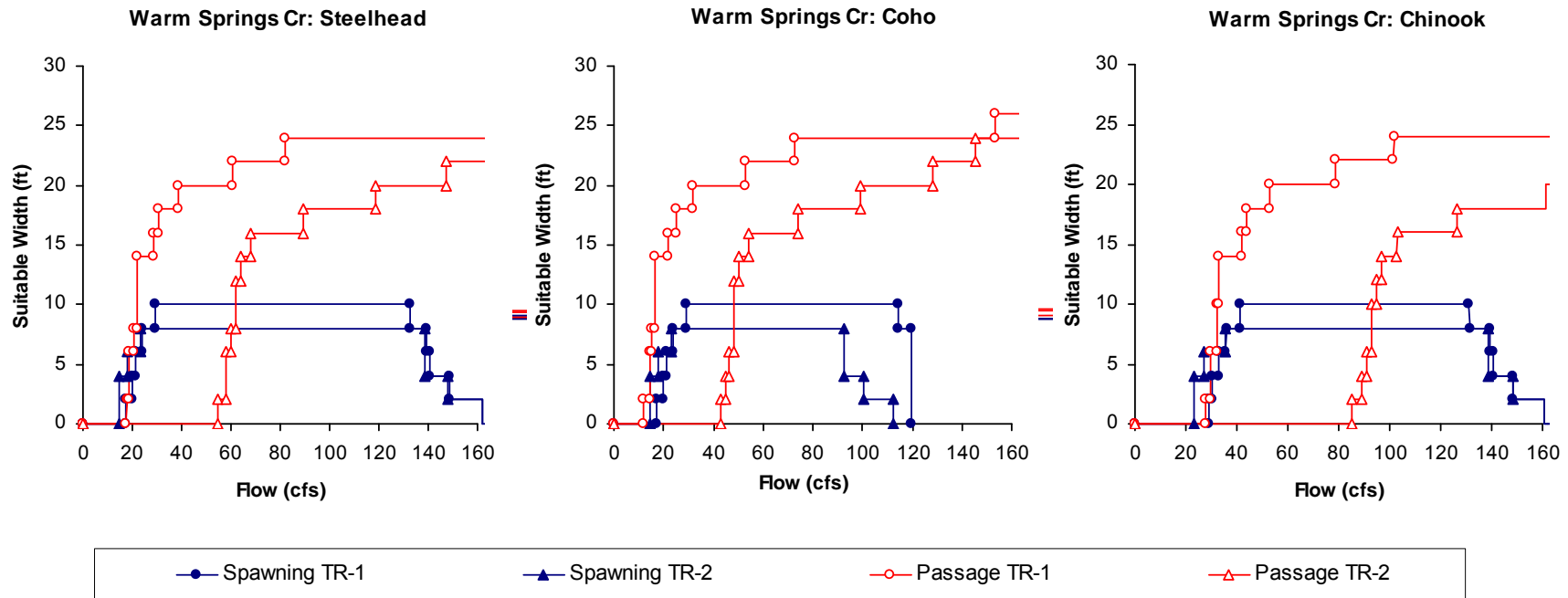
Figure H-8.　Habitat-flow curves calculated for upstream passage and spawning transects sampled in the Warm Springs Creek validation site.
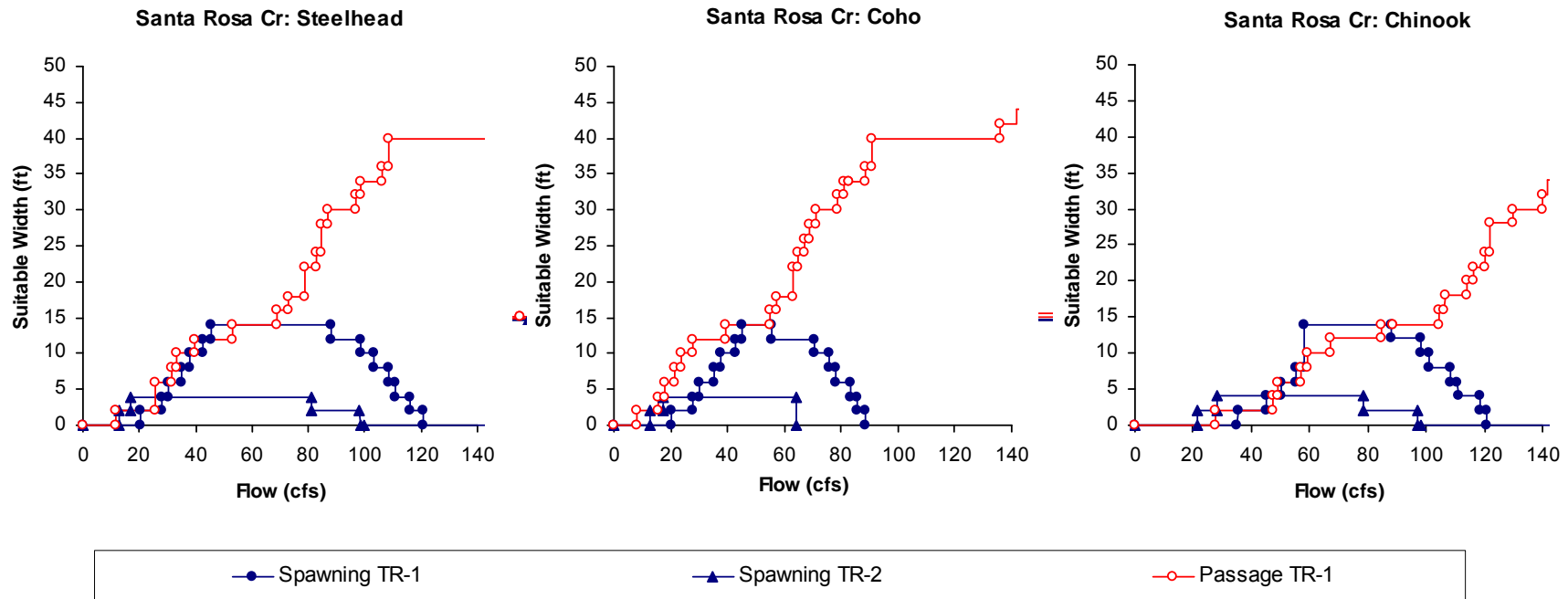
Figure H-9.   Habitat-flow curves calculated for upstream passage and spawning transects sampled in the Santa Rosa Creek validation site.
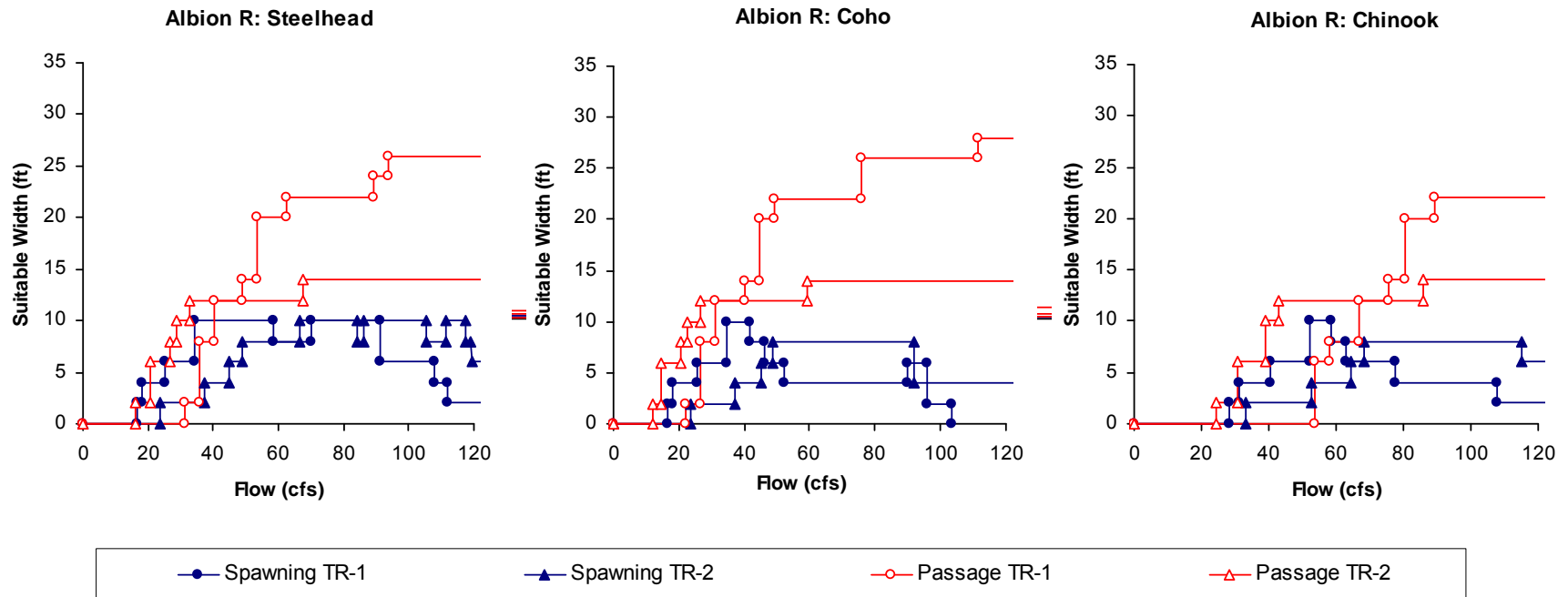
Figure H-10. Habitat-flow curves calculated for upstream passage and spawning transects sampled in the Albion River validation site.
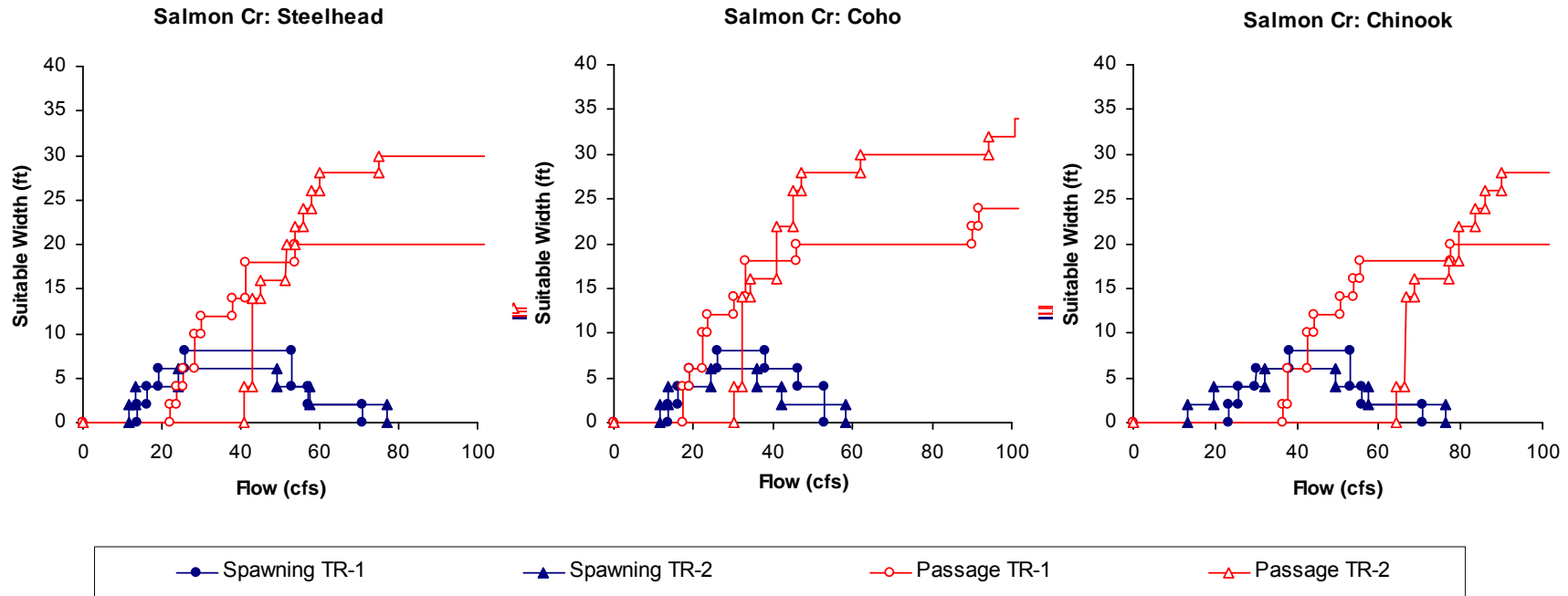
Figure H-11.   Habitat-flow curves calculated for upstream passage and spawning transects sampled in the Salmon Creek validation site.
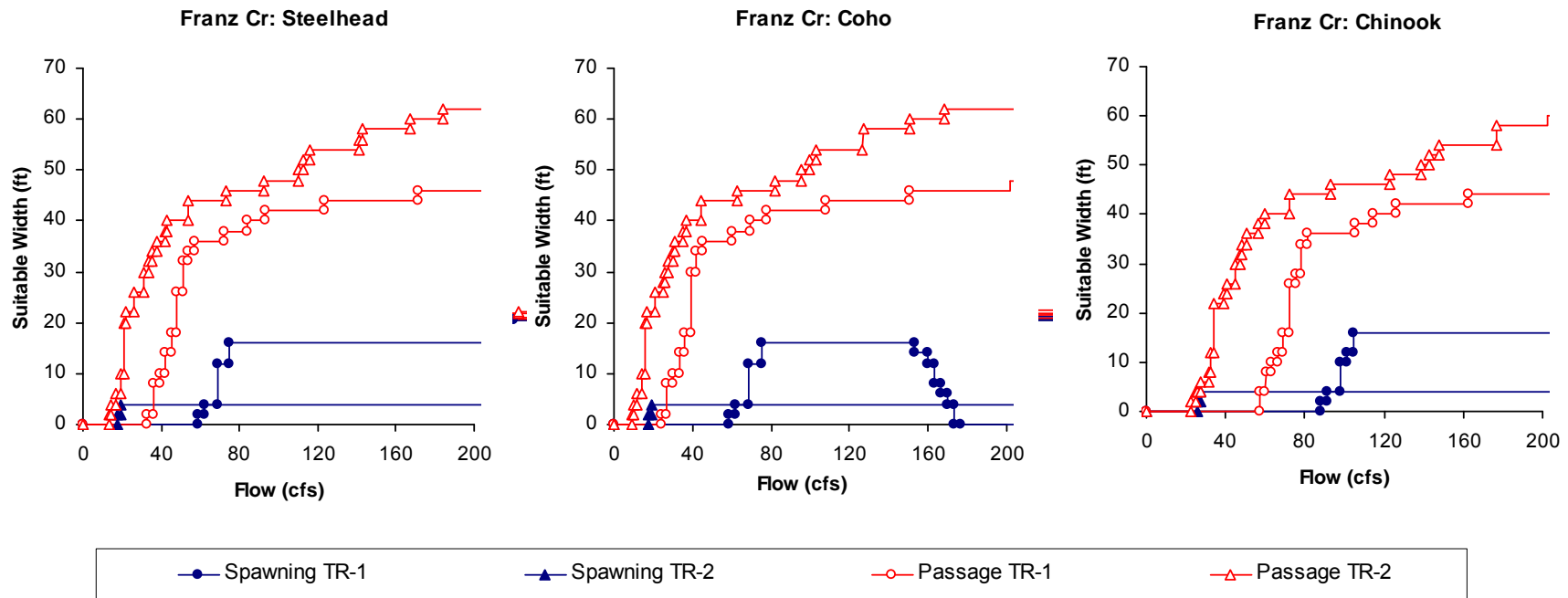
Figure H-12.   Habitat-flow curves calculated for upstream passage and spawning transects sampled in the Franz Creek validation site.
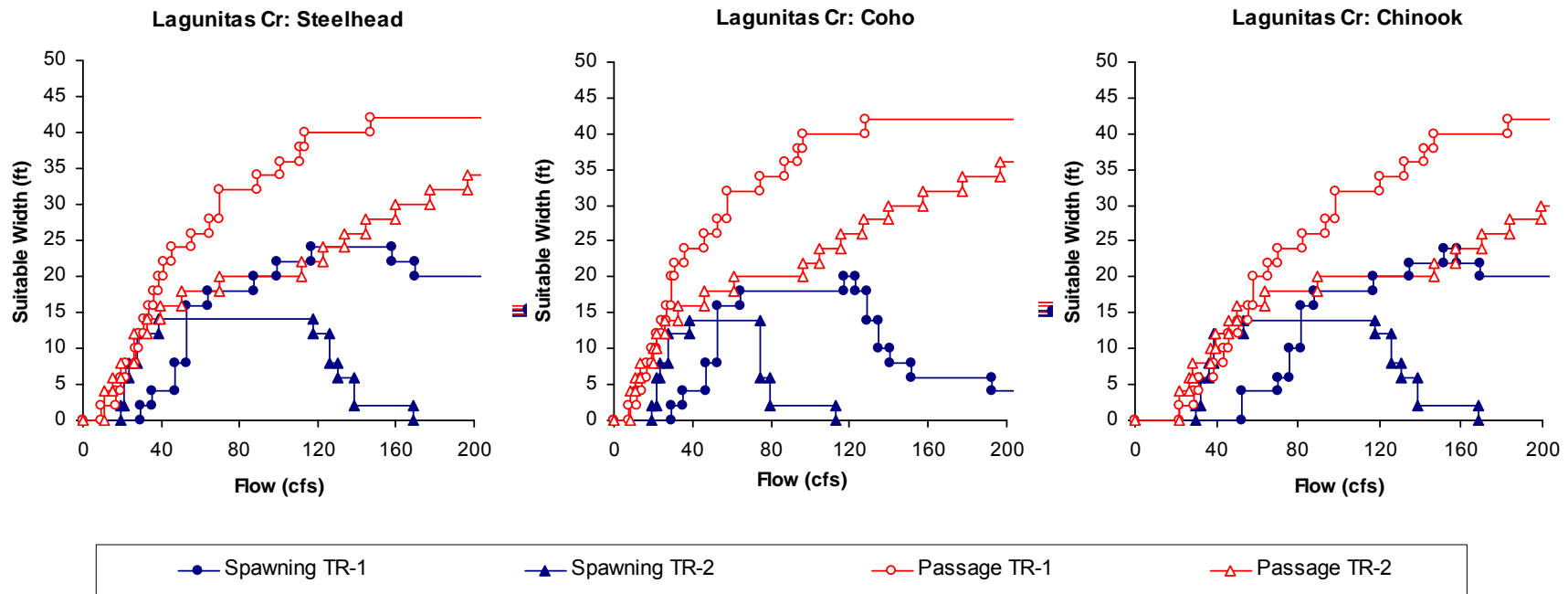
Figure H-13.   Habitat-flow curves calculated for upstream passage and spawning transects sampled in the Lagunitas Creek validation site.