

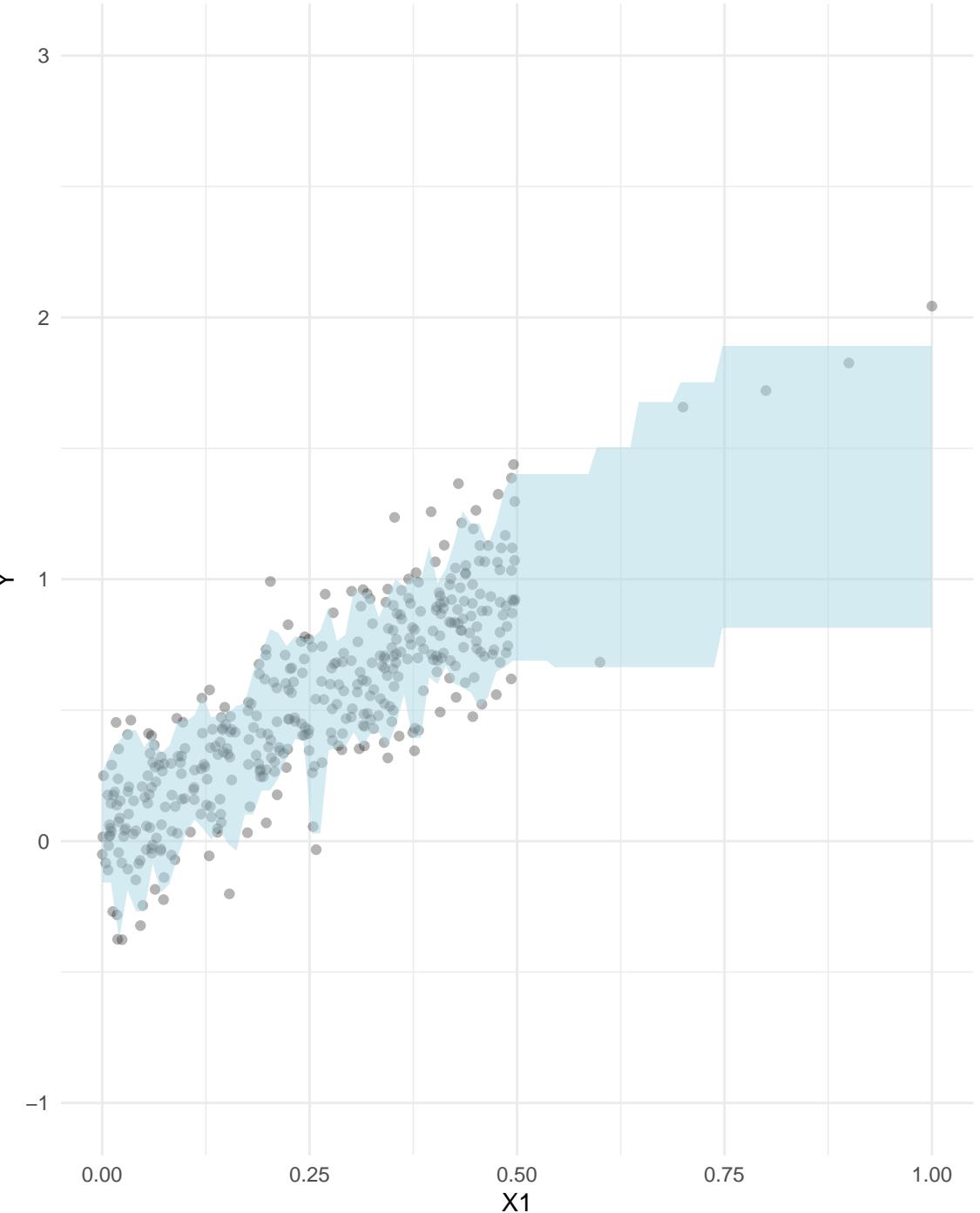
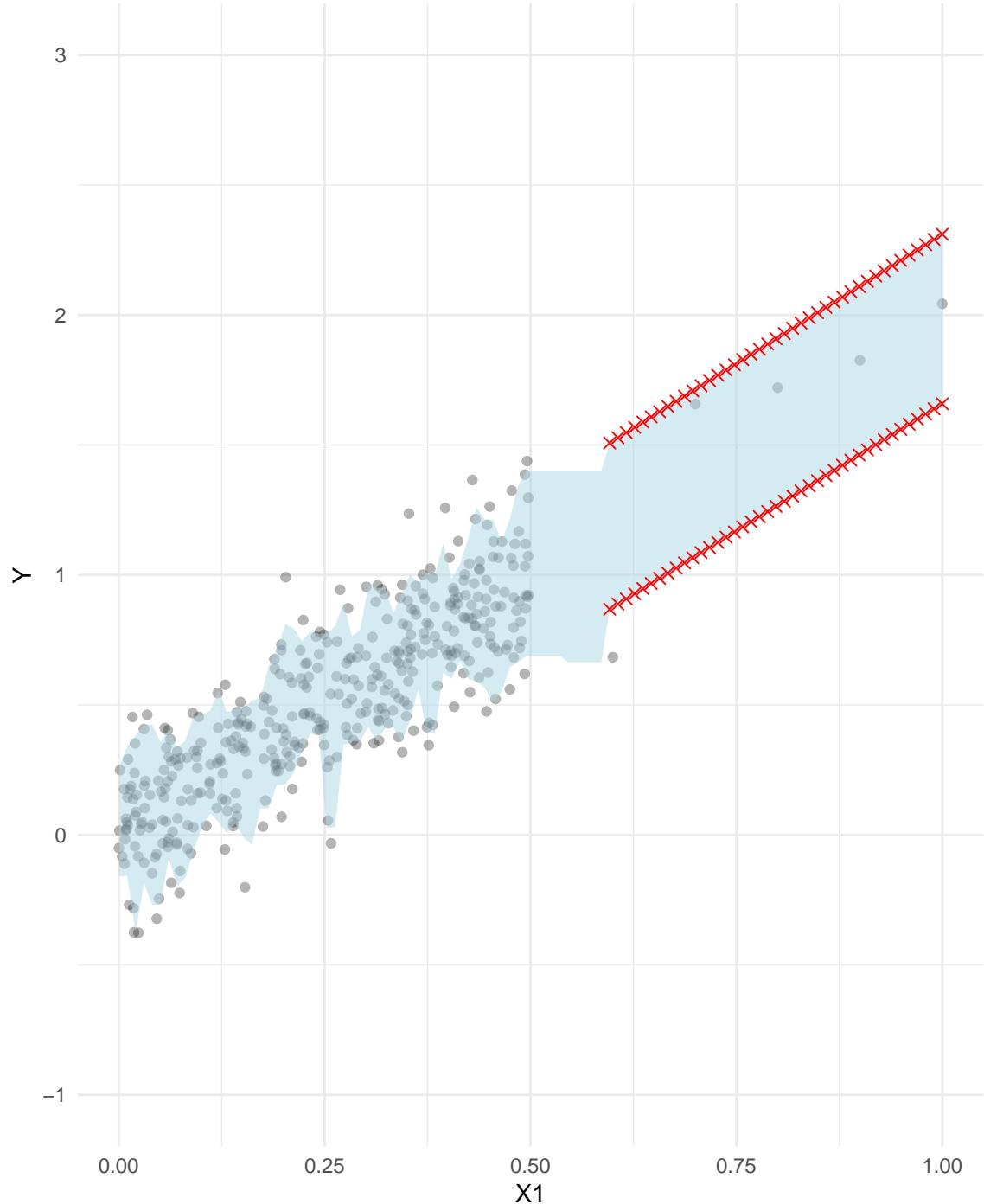
SCENARIO A: LINEAR DATA (kNN vs KDE)

A1: Robust kNN (Linear Fallback)

Trigger: Distance > 0.1

A2: Naive kNN (No Fallback)

Fails: Contaminated neighbors

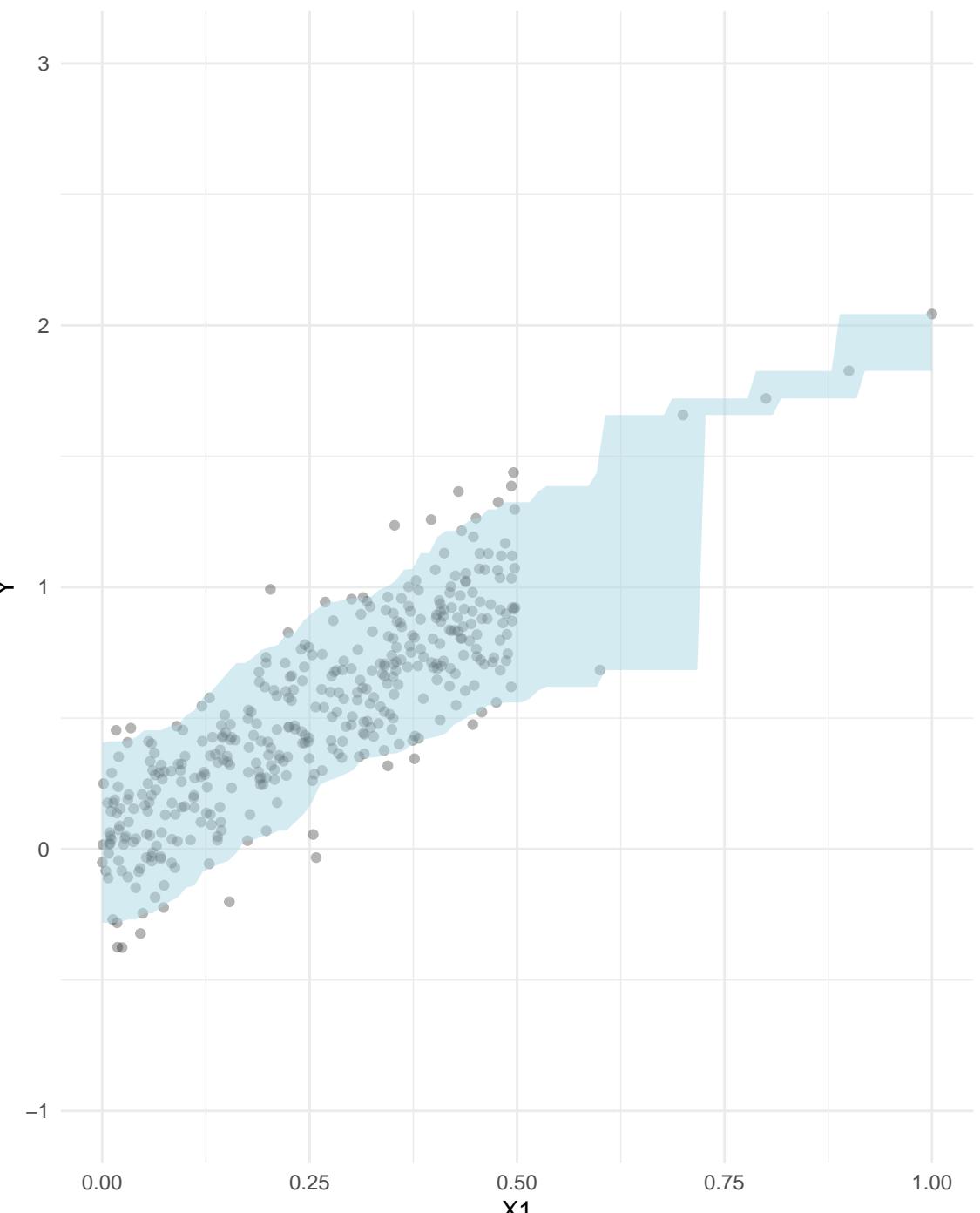
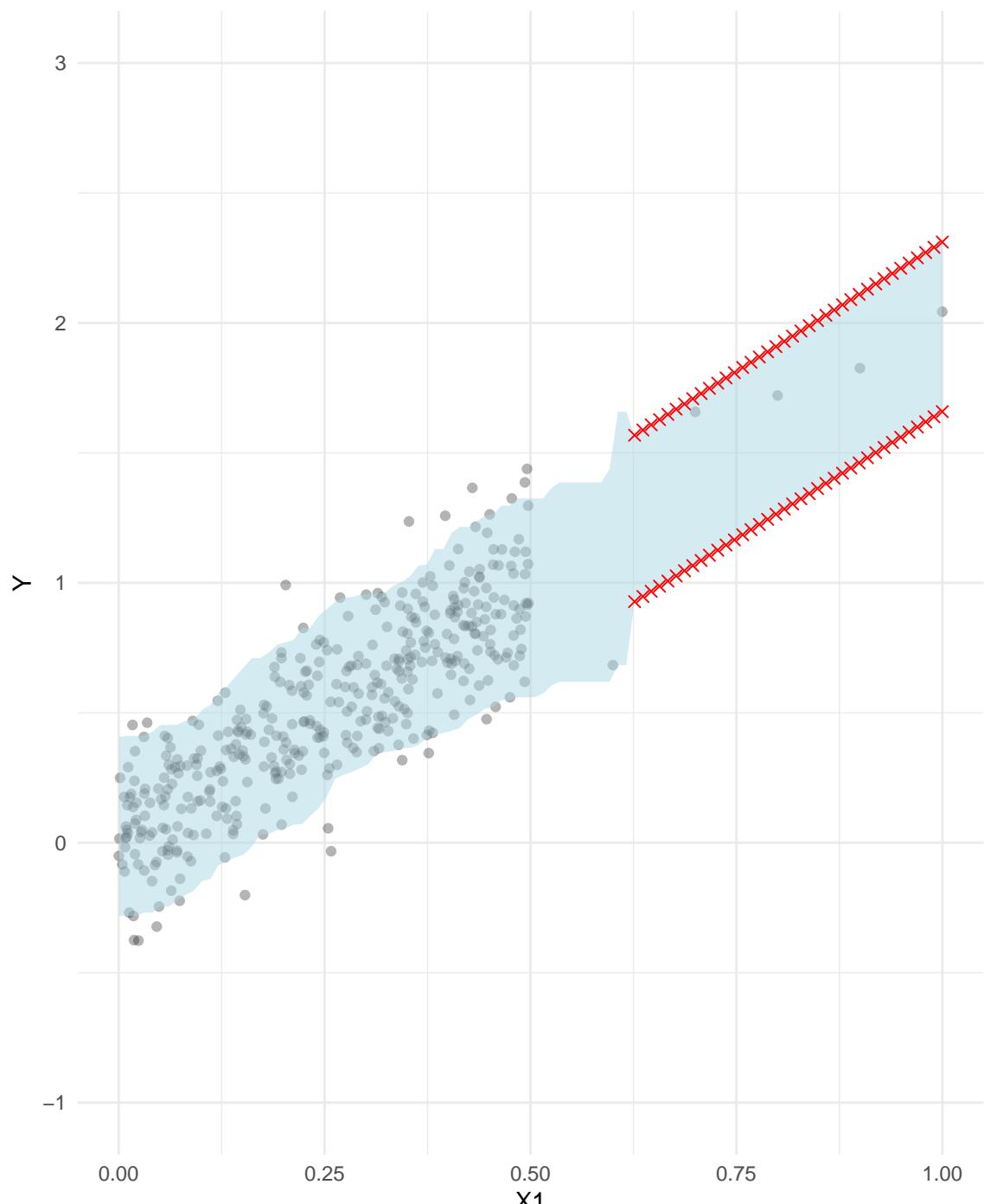


A3: Robust KDE (Linear Fallback)

Trigger: Effective Sample Size < 5

A4: Naive KDE (No Fallback)

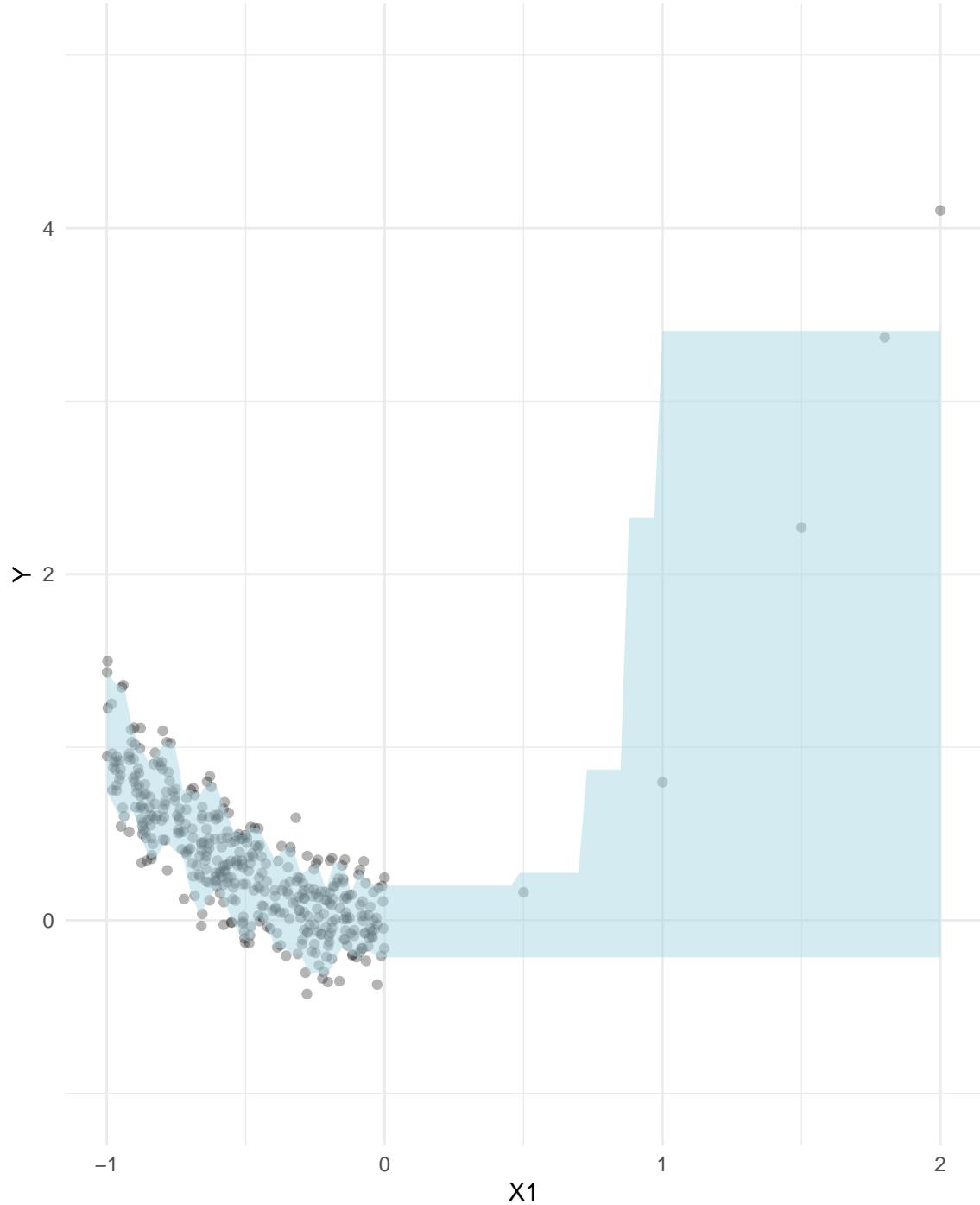
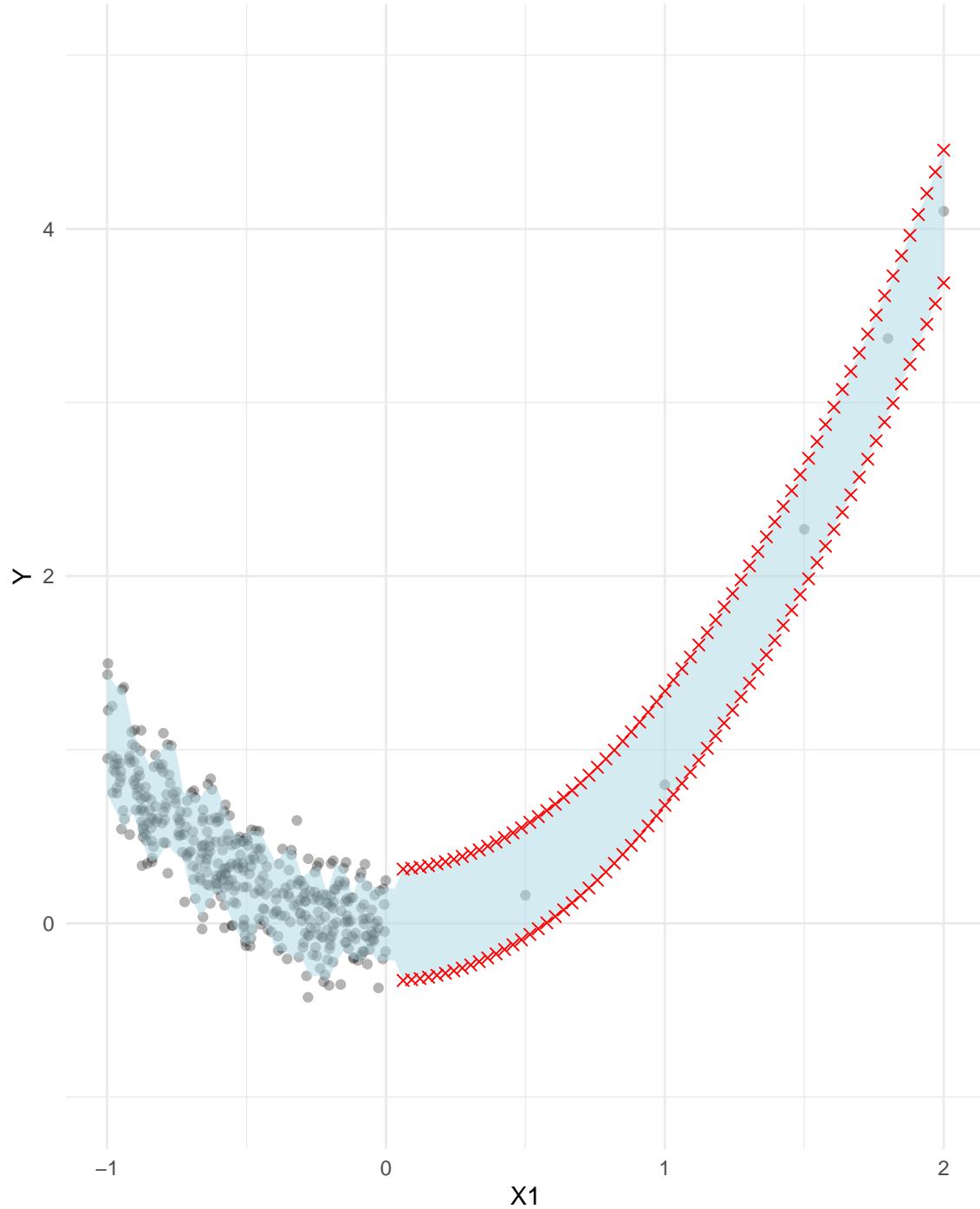
Fails: Unstable density estimate in gap



SCENARIO B: NON-LINEAR DATA (kNN vs KDE)

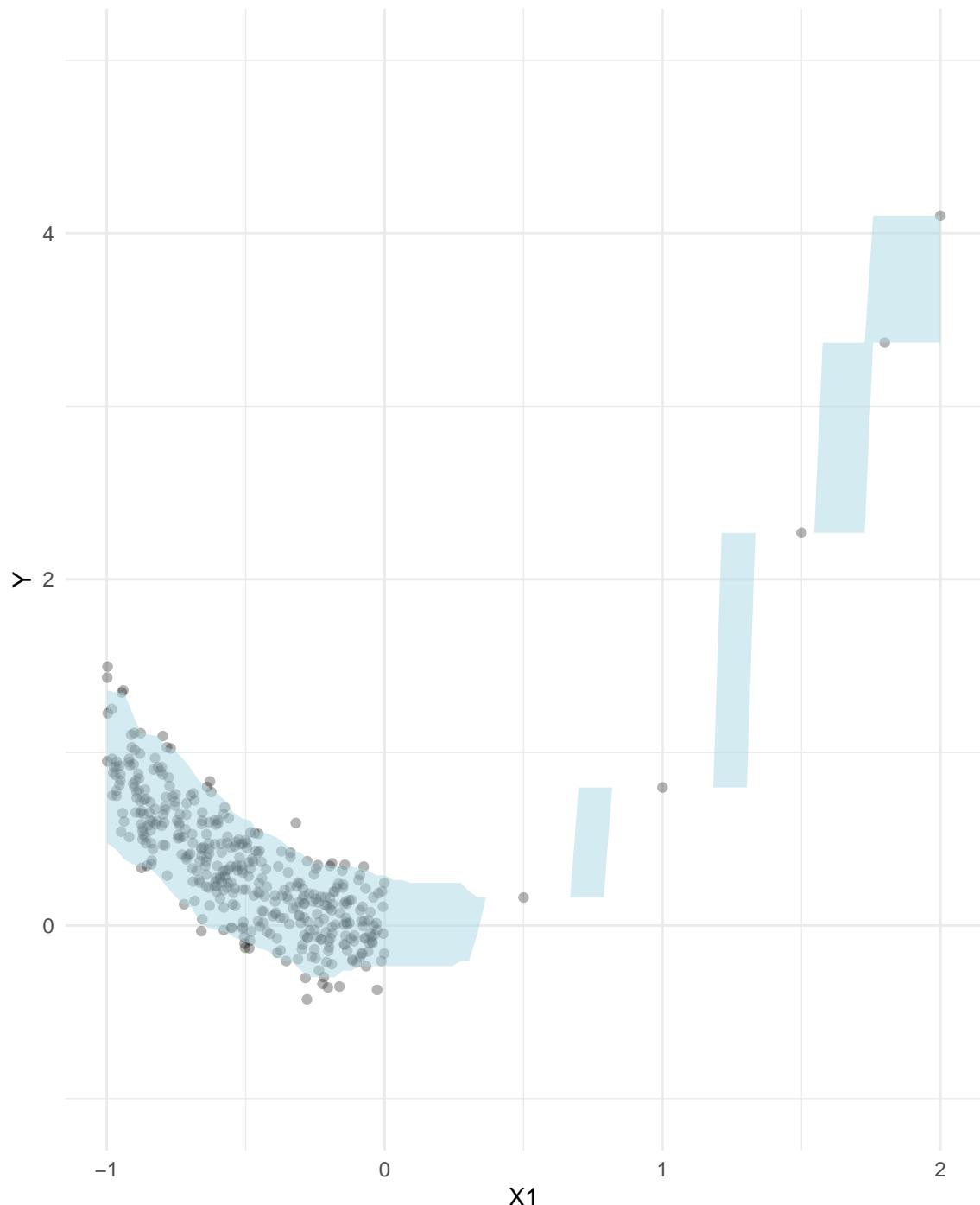
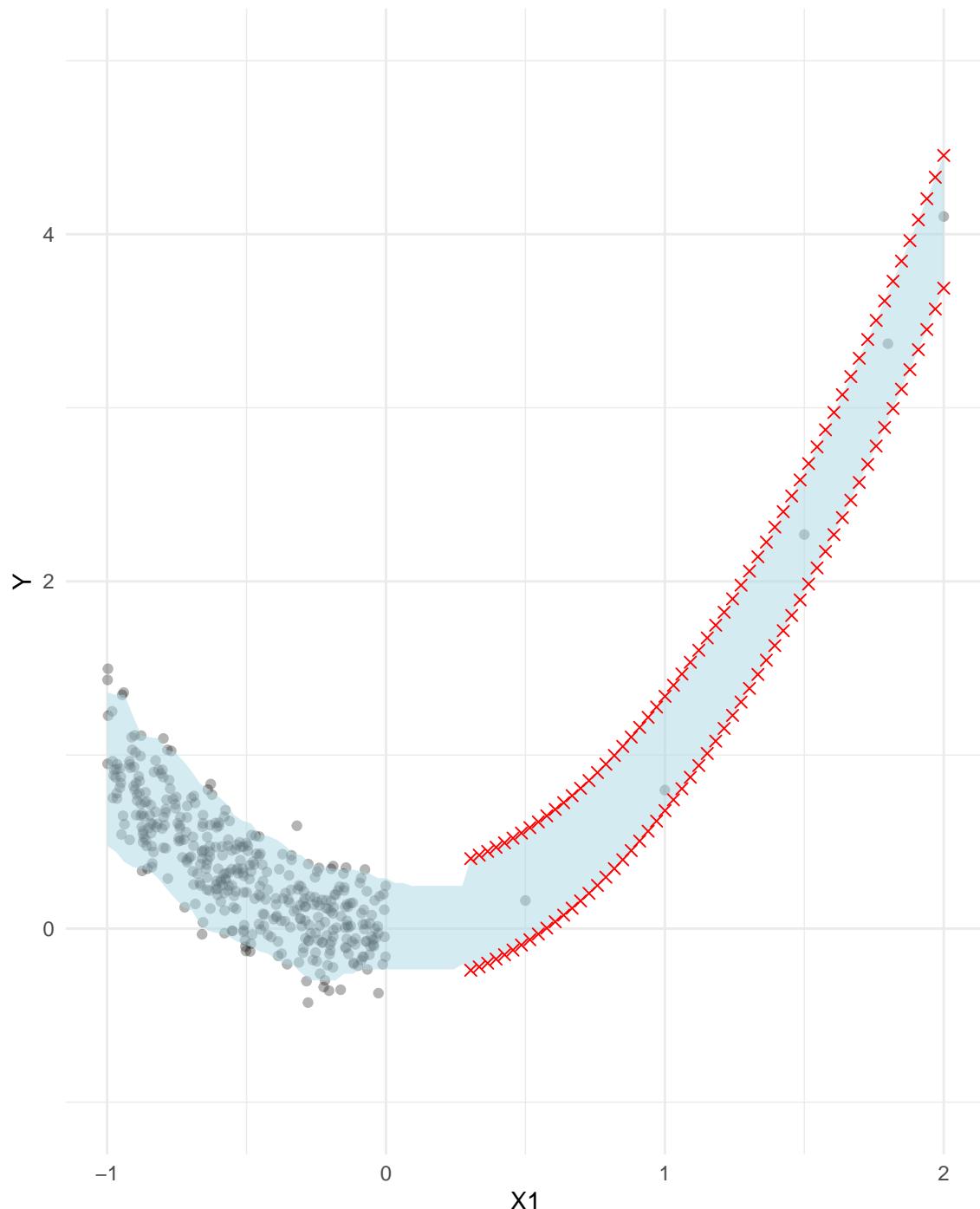
B1: Robust kNN (Quadratic Fallback)
Extrapolates curve correctly (*)

B2: Naive kNN (No Fallback)
Fails to extrapolate trend



B3: Robust KDE (Quadratic Fallback)
Extrapolates curve correctly (*)

B4: Naive KDE (No Fallback)
Unstable/Wide in sparse region



Part 3: Quantitative Metrics (Compare Winkler Scores)

	Coverage	Avg_Width	Winkler_Score	Target_Alpha
<i>kNN Robust (Quad)</i>	0.82	0.631	0.961	0.1
<i>KDE Robust (Quad)</i>	0.85	0.676	0.902	0.1
<i>kNN Naive</i>	0.76	1.676	2.764	0.1