In[37]:=

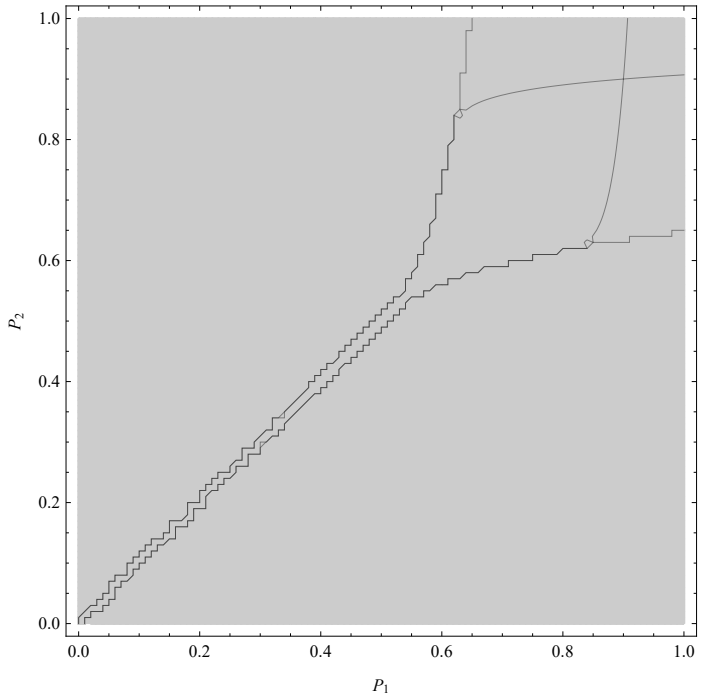
```
Clear[r1, K1, a1, h1, eps1, eps2, e1, c1, p1,
 L1 , r2, K2, a1, a2, h2, e2, c2, p2, L2 , P1, P2, curve1]
r1 := 1; r2 := 1; K1 := 500; K2 := 500; a1 := 0.9; a2 := 0.9; eps1 := 0.1;
eps2 := 0.1; h1 := 50; h2 := 50; e1 := 50; e2 := 50; L1 := 50; L2 := 50;
curve1 = {{0, 0}}; curve2 = {{0, 0}}; surf1 = {}; surf2 = {};
```

In[39]:=

```
Do[
 {sol = NDSolve[{
      N1'[t] == r1 * N1[t] * (1 - N1[t] / K1) - (1 - P1) a1 * N1[t] * N2[t] / (e1 + N1[t]) +
        P1 * eps1 * N1[t] * N2[t] / (h2 + N2[t]),
      N2'[t] == r2 * N2[t] * (1 - N2[t] / K2) - (1 - P2) a2 * N1[t] * N2[t] / (e2 + N2[t]) +
        P2 * eps2 * N1[t] * N2[t] / (h1 + N1[t]),
      N1[0] == 500, N2[0] == 500}, {N1, N2}, {t, 0, 100}],
  AppendTo[surf1, {P1, P2, Extract[Evaluate[N1[100] /. sol], {1}]}],
  AppendTo[surf2, {P1, P2, Extract[Evaluate[N2[100] /. sol], {1}]}]
 }, {P1, 0, 1, 0.01},
 {P2, 0, 1, 0.01}
]

S1 = ListContourPlot[{surf1, surf2}, Mesh → None,
  Contours → {K1 - 0.001, 0.001}, FrameLabel → {P1, P2}, ContourShading → None]
```

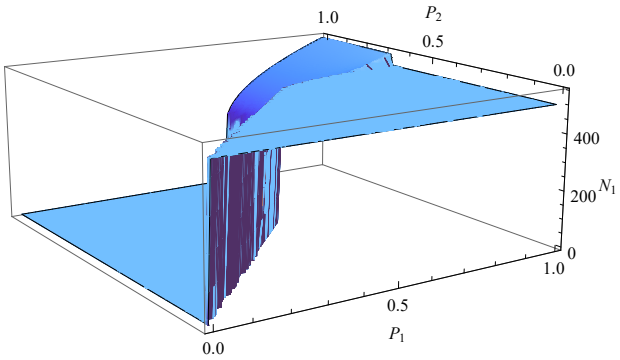
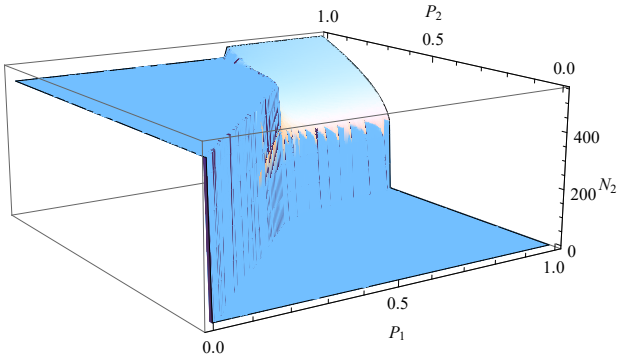
Out[40]=



In[41]:=

```
ListPlot3D[surf1, Mesh → None, AxesLabel → {P1, P2, N1 }, PlotRange → All]
ListPlot3D[surf2, Mesh → None, AxesLabel → {P1, P2, N2}, PlotRange → All]
```

Out[41]=



Out[42]=