Figure 76. Levels of herbivory 1950-1969 on the entire landscape with no culling (top panels), or culling to 125-175 horses (bottom panels)
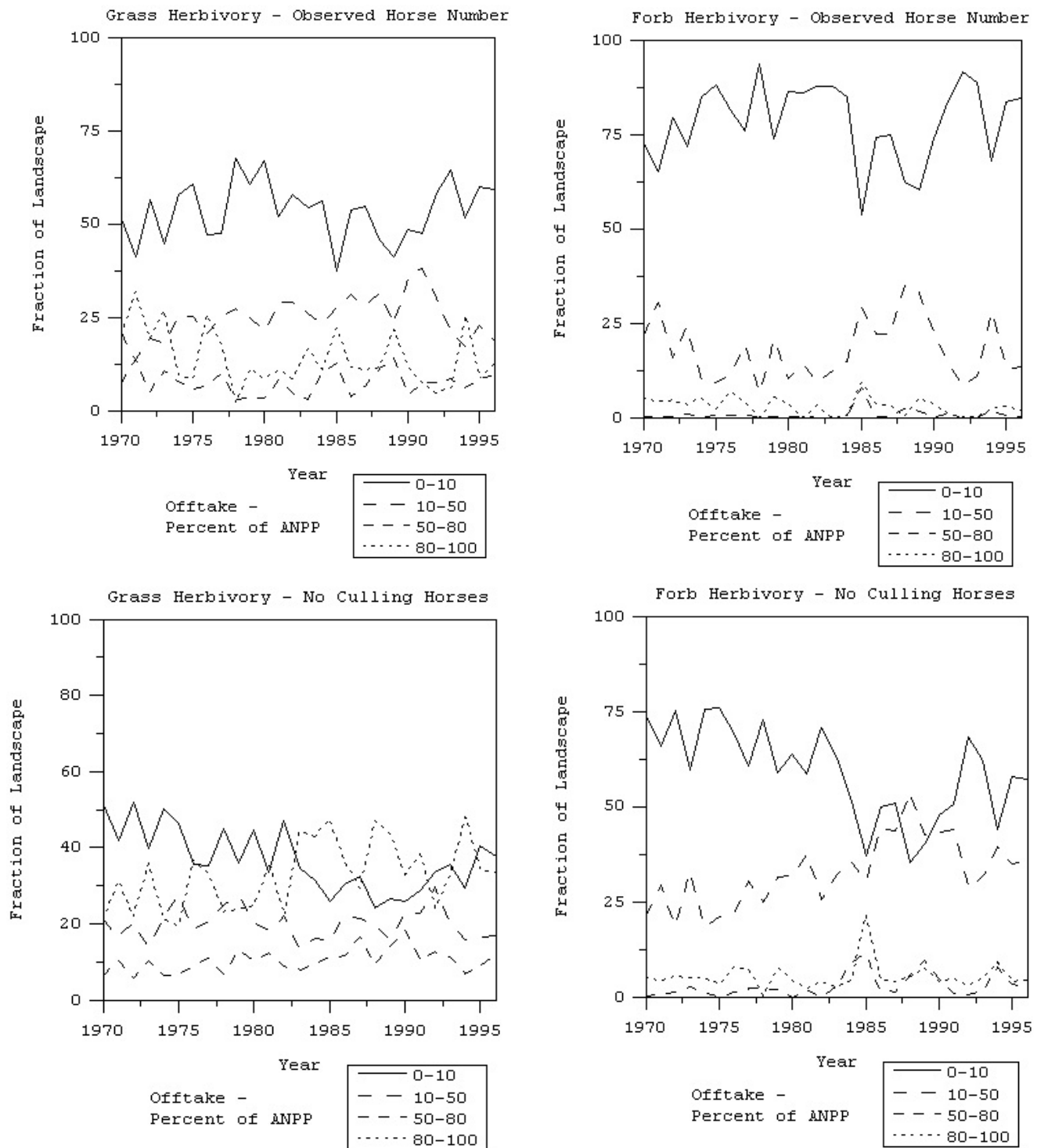.

Figure 77. Herbivory levels 1970-1996 over the entire landscape with the observed numbers of horses and bighorn sheep, and with no culling of horses and simulated sheep populations.
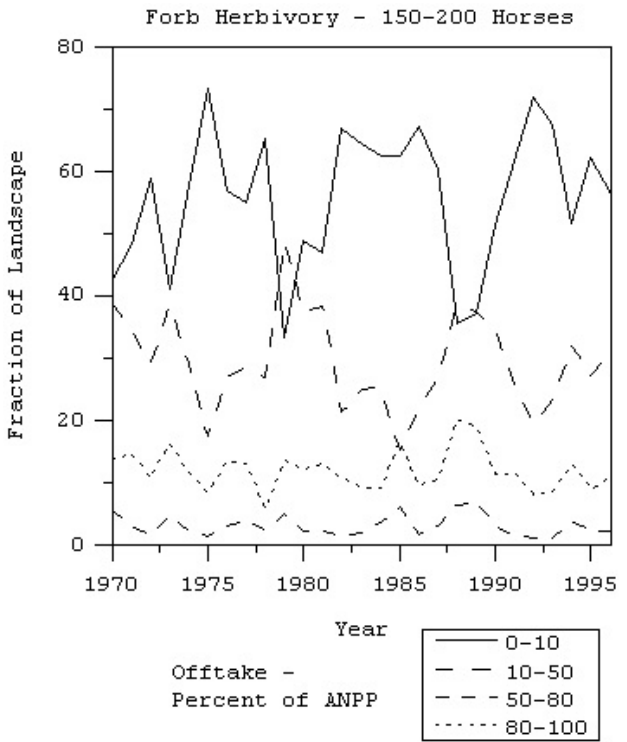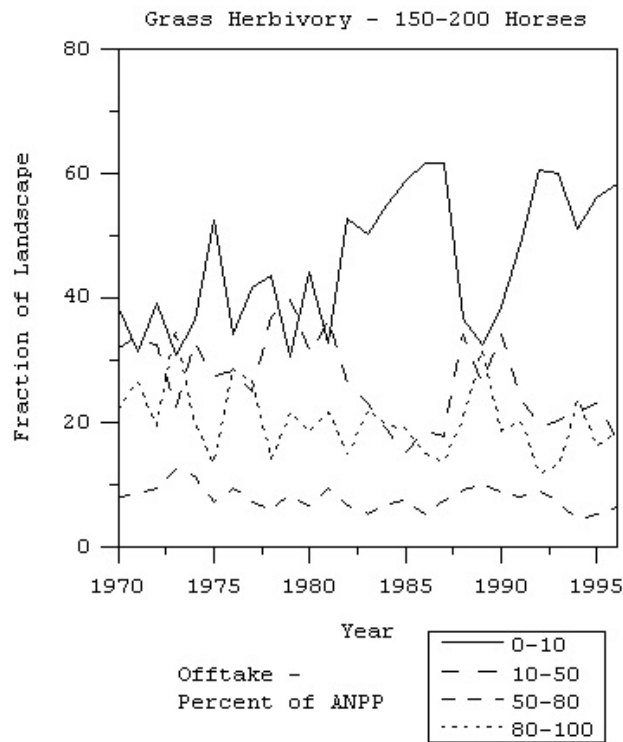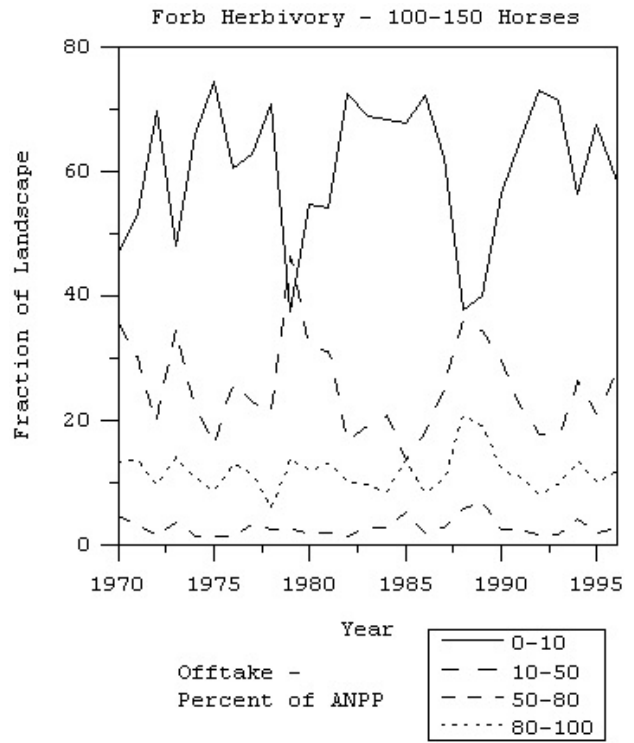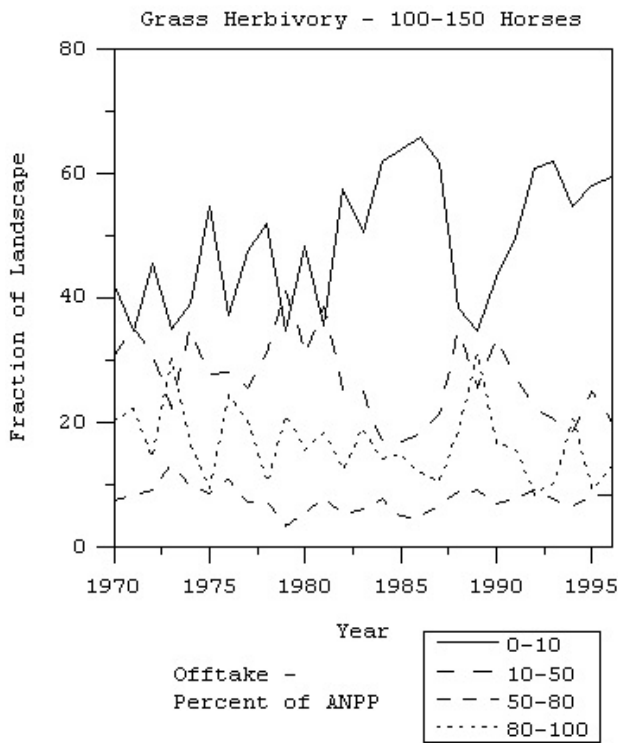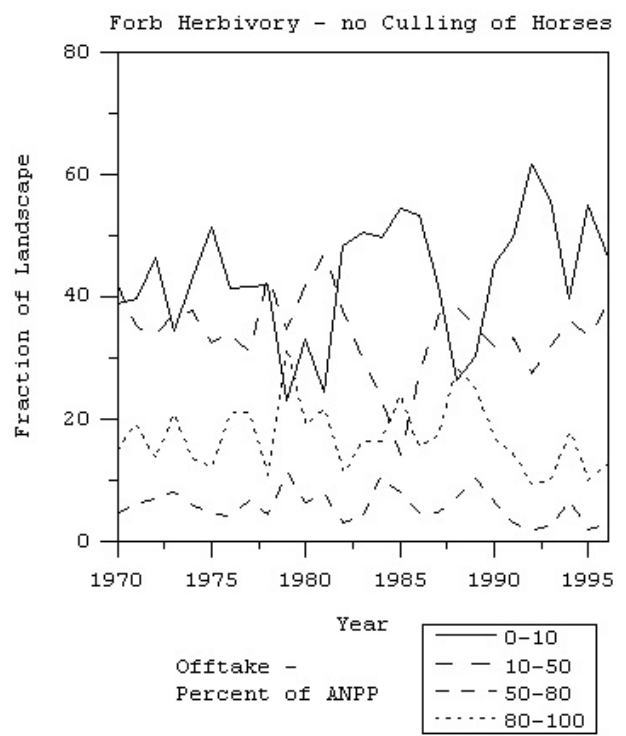
Figure 78. Levels of herbivory 1970-1996 on the primary horse range with horses culled to 100-150 (top panels) or to 150-200 (bottom panels).

Grass Herbivory - 200-250 Horses

Forb Herbivory - 200-250 Horses

Fraction of Landscape

80

60

40

20

0

1970   1975   1980   1985   1990   1995

Year

Offtake –
Percent of ANPP

0-10
10-50
50-80
80-100

Grass Herbivory - No Culling of Horses

Forb Herbivory - no Culling of Horses

Fraction of Landscape

80

60

40

20

0

1970   1975   1980   1985   1990   1995

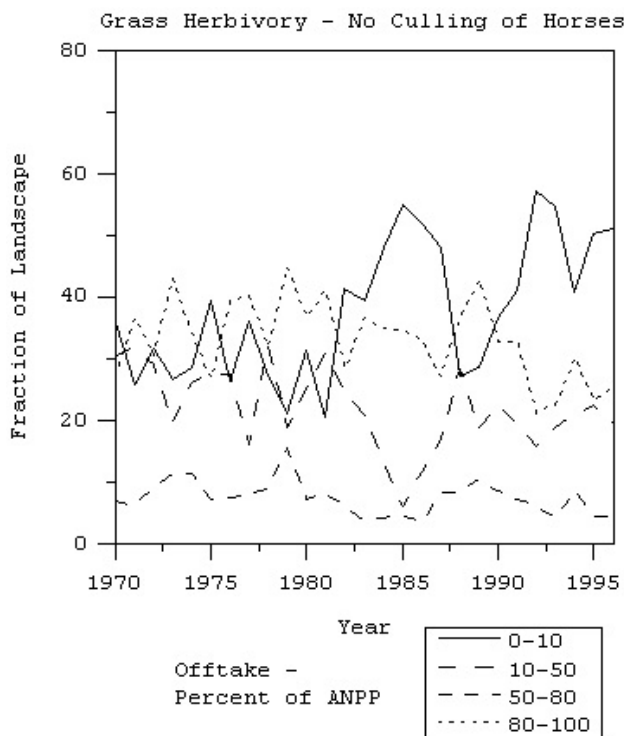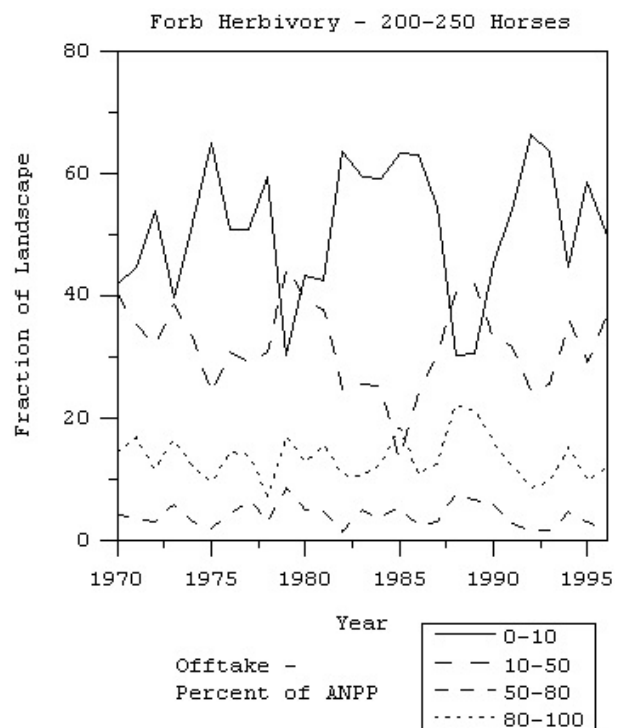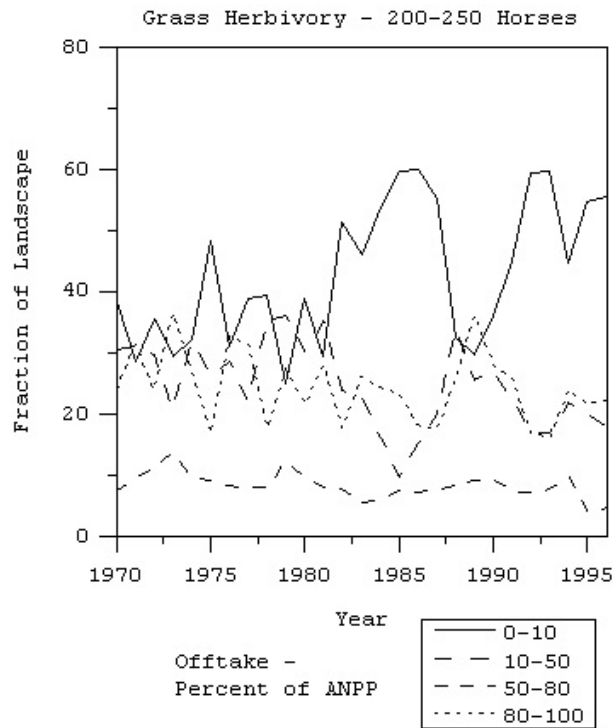Year

Offtake –
Percent of ANPP

0-10
10-50
50-80
80-100

Figure 79. Levels of herbivory 1970-1996 on the primary horse range with horses culled to 200-250 (top panels) or with no culling of horses (bottom panels).
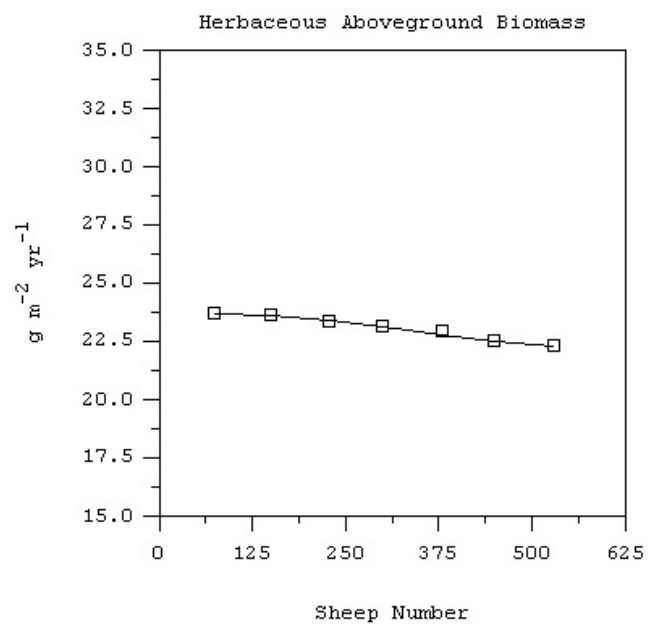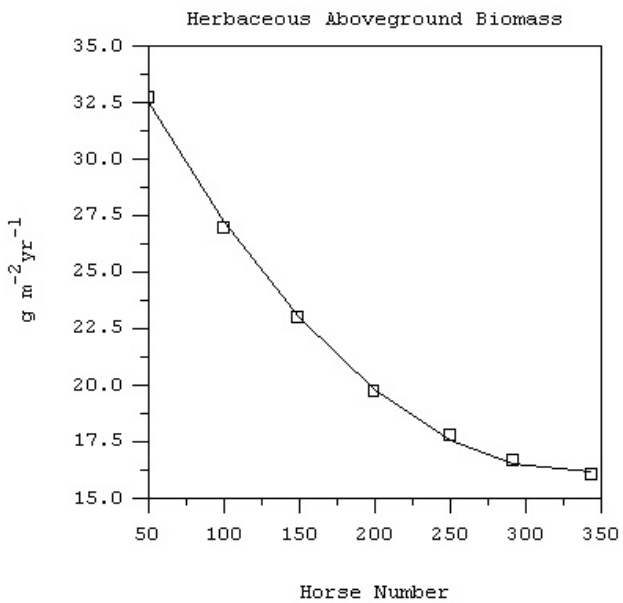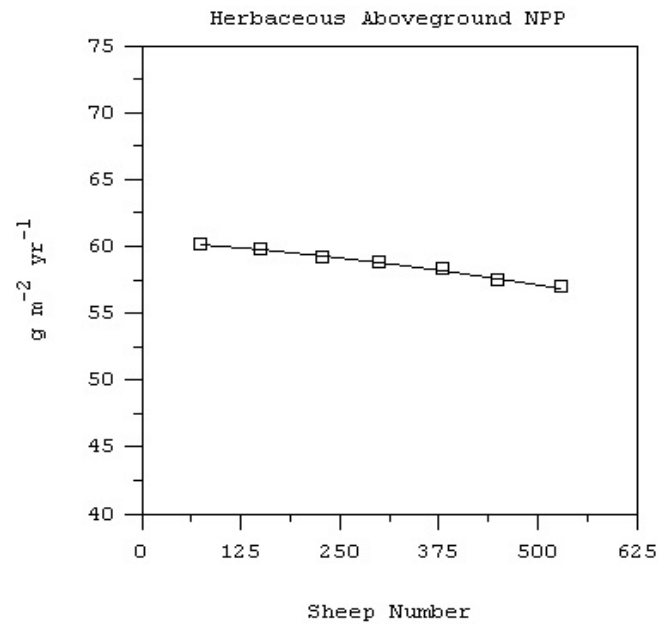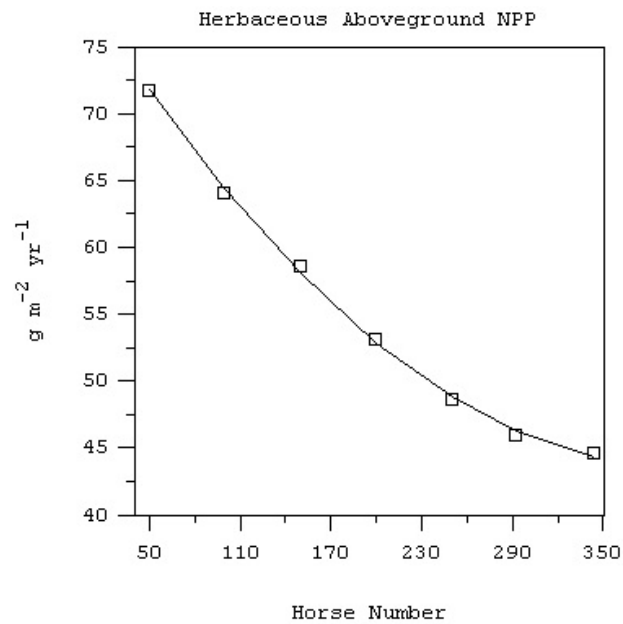
Figure 80. Herbaceous aboveground net primary production (ANPP) and mean aboveground live plus dead biomass responses to horse and sheep numbers, on the primary horse range only, and with fixed numbers of animals through time.
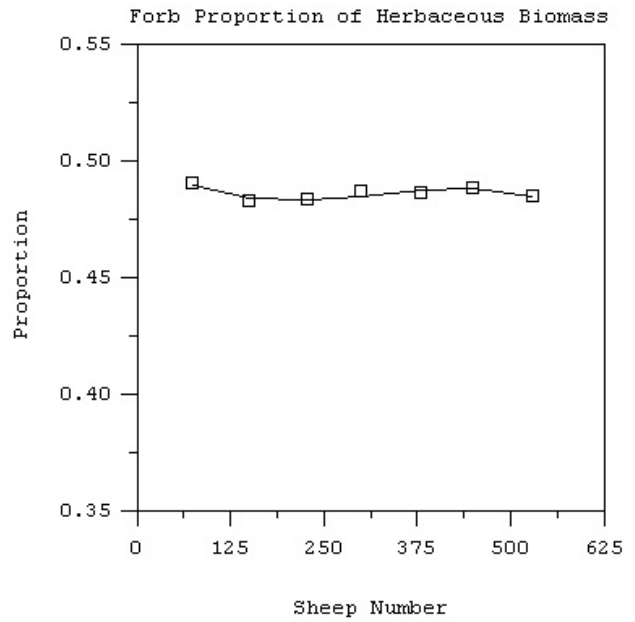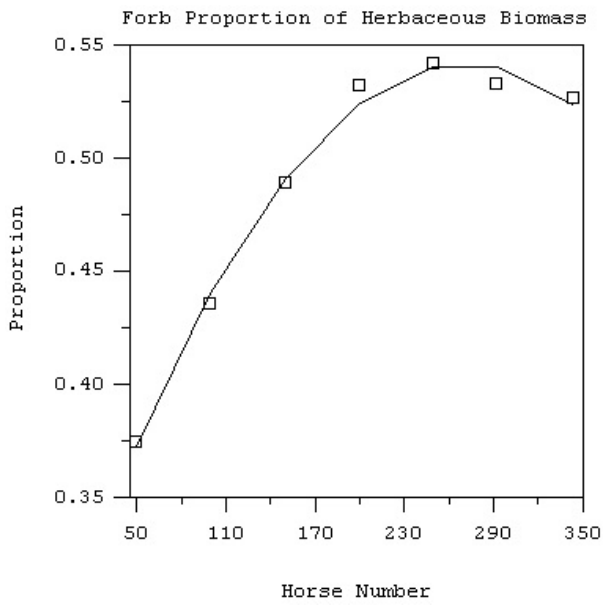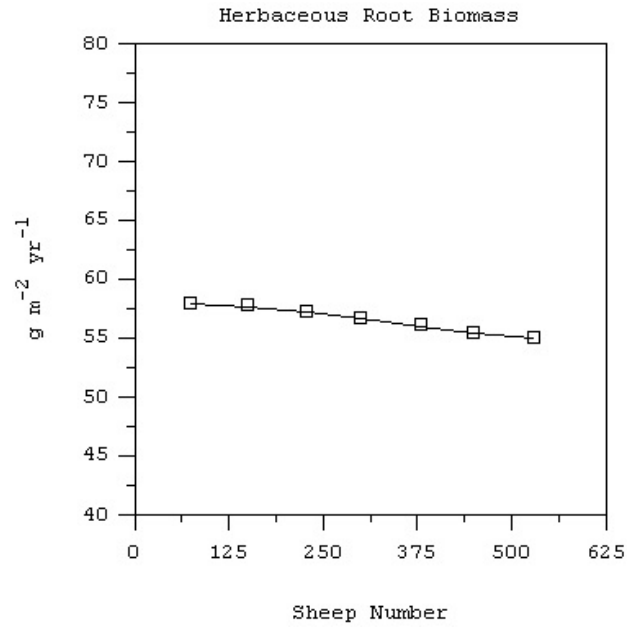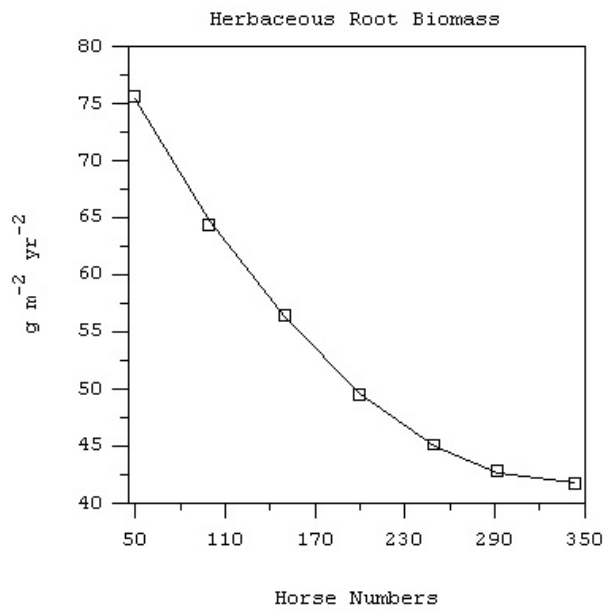
Figure 81. Herbaceous root biomass and proportion forb responses to horse and sheep numbers on the primary horse range, with fixed numbers of animals through time. Proportion forb is the proportion of forbs in total aboveground live plus dead biomass, year-long..
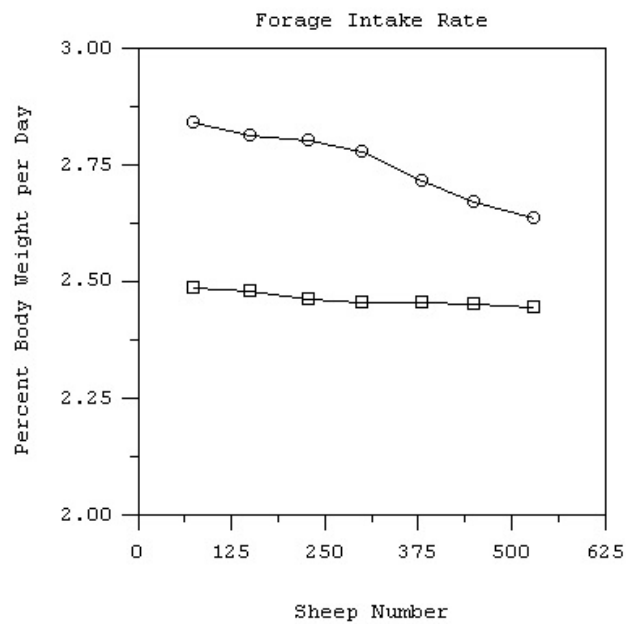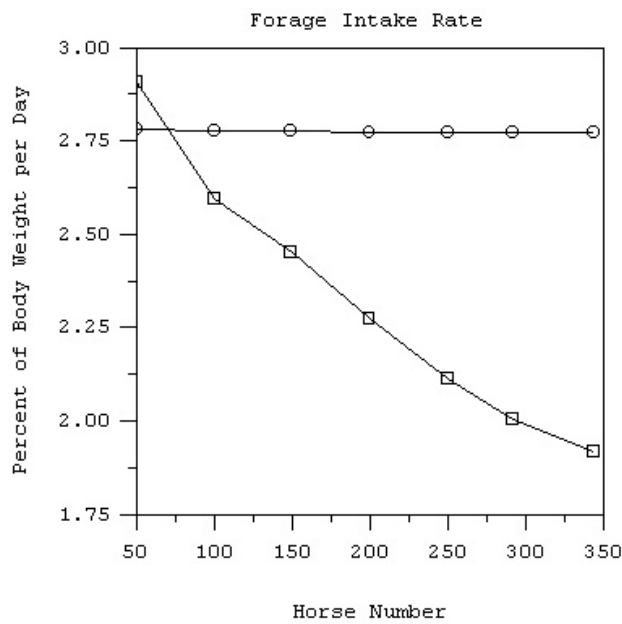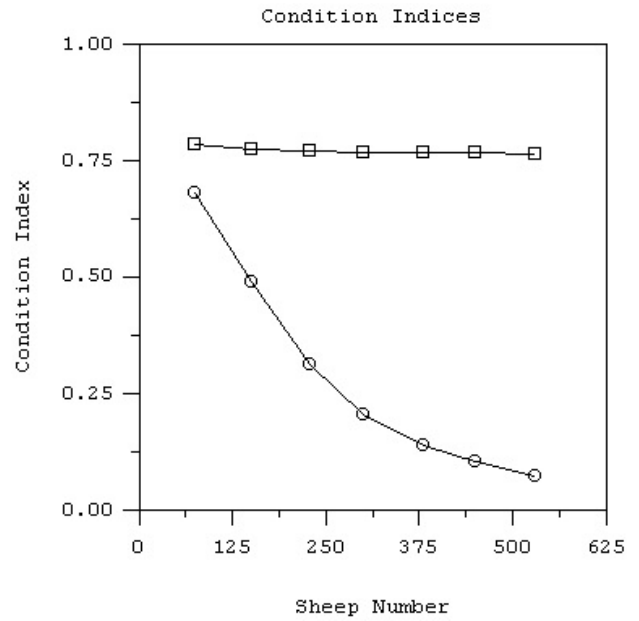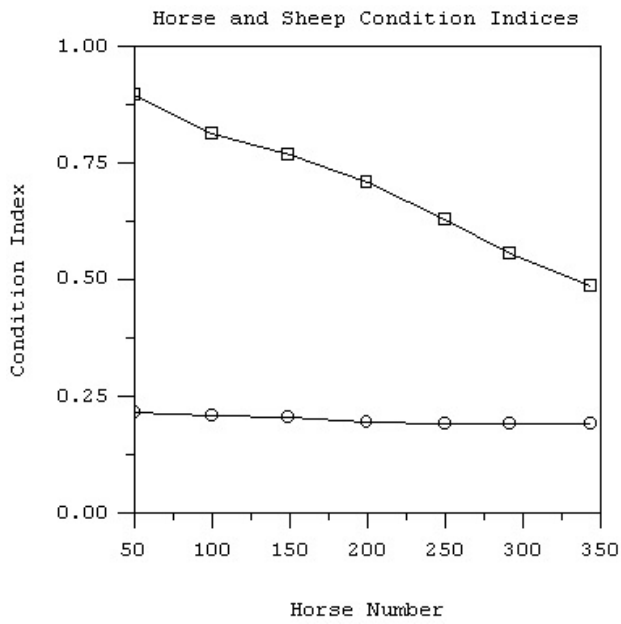
Figure 82. Horse (squares) and sheep (circles) condition and forage intake responses to horse and sheep numbers, with fixed numbers of animals throughout time
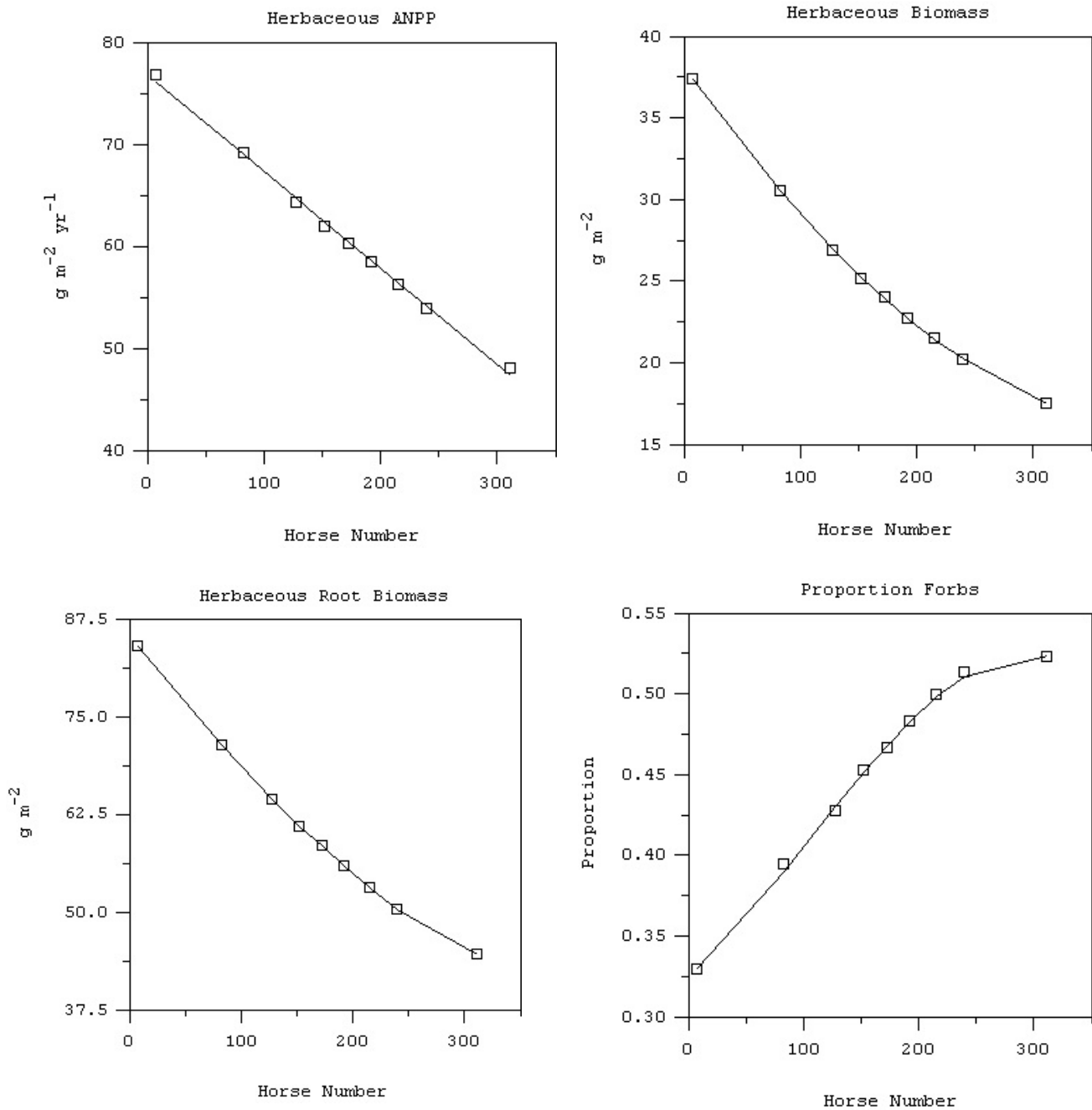
Figure 83. Herbaceous responses to horse number, on the primary horse ranges, with the same weather in all runs, and with culling to 0, 50,100,125, 150, 175, 200, and 225 when they reach 50 more that the target number, and with no culling. Runs were for the period 1970-1996, with horse numbers starting at 275. Herbaceous ANPP is aboveground net primary production. Herbaceous biomass is year-long mean aboveground live plus dead biomass. Proportion forbs is the proportion of aboveground biomass composed of forbs. Herbaceous root biomass is live roots only.
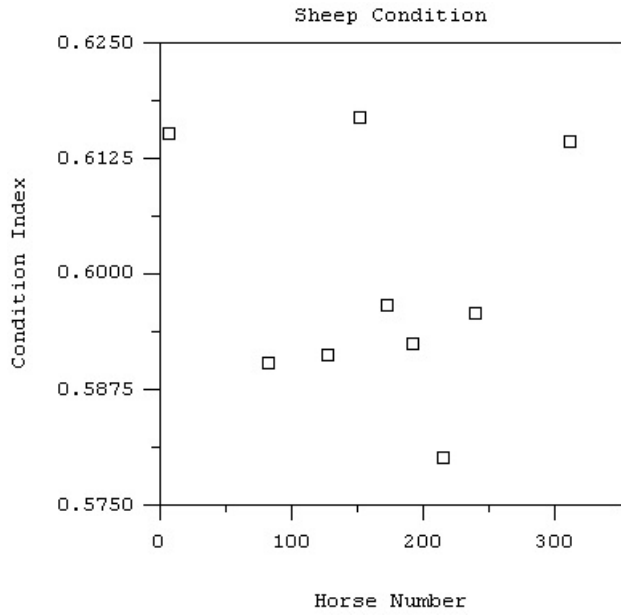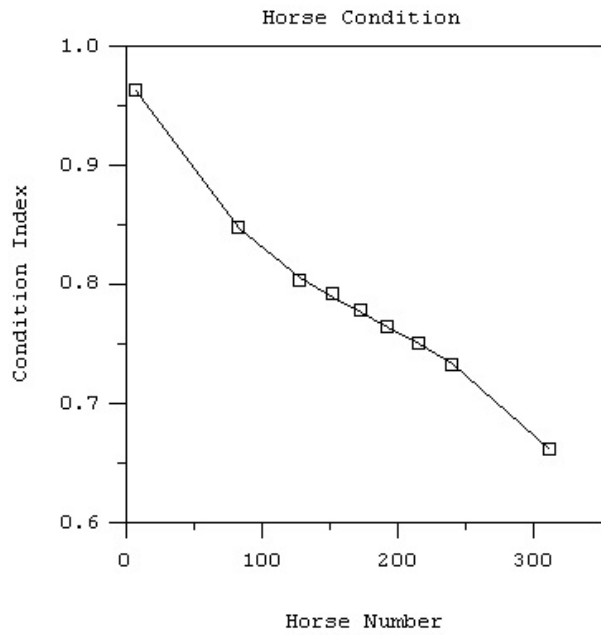
Figure 84. Animal condition responses to horse number, with the same weather in all runs, and with culling to 0, 50,100,125, 150, 175, 200, and 225 when they reach 50 more that the target number. Runs were for the period 1970-1996, with horse numbers starting at 275.
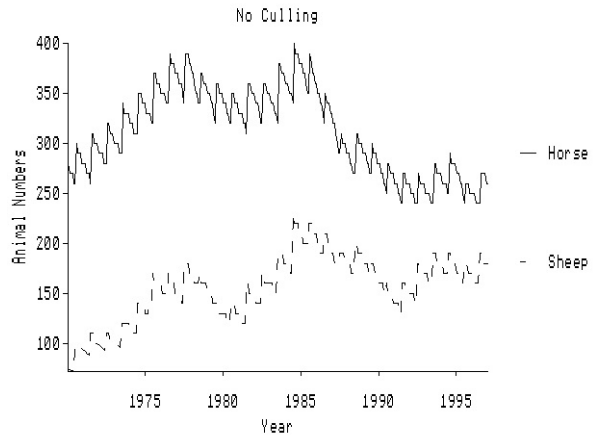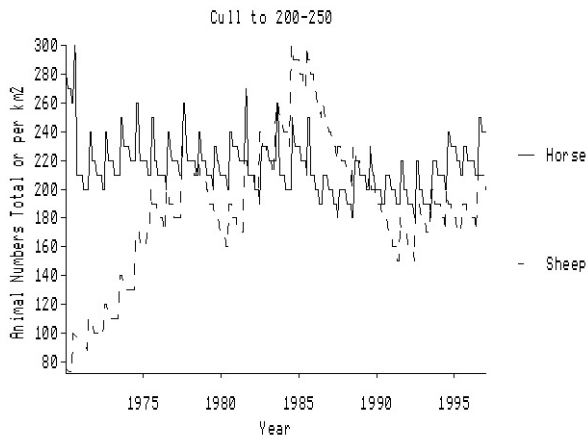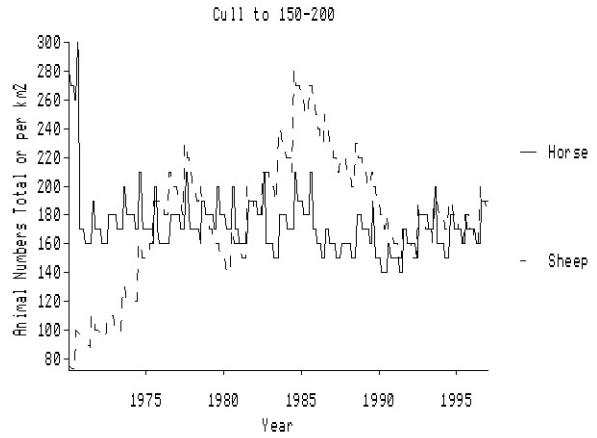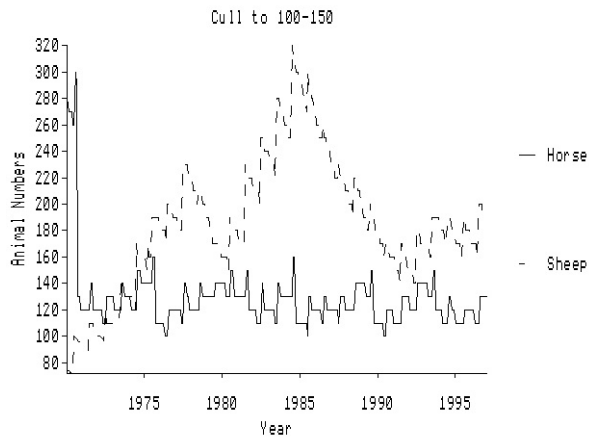
Figure 85. Horse population trajectories with the same weather in all runs, and with horse culling to 0, 50,100,125, 150, 175, 200, and 225 when they reach 50 more that the target number. Runs were for the period 1970-1996, with horse numbers starting at 275.
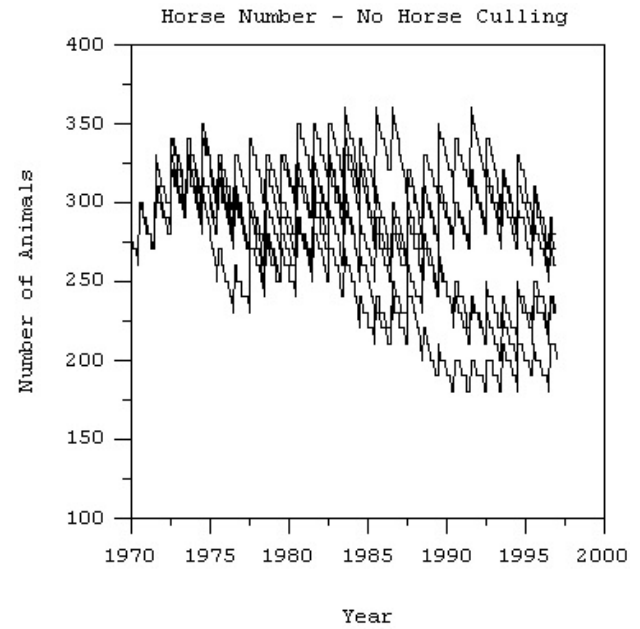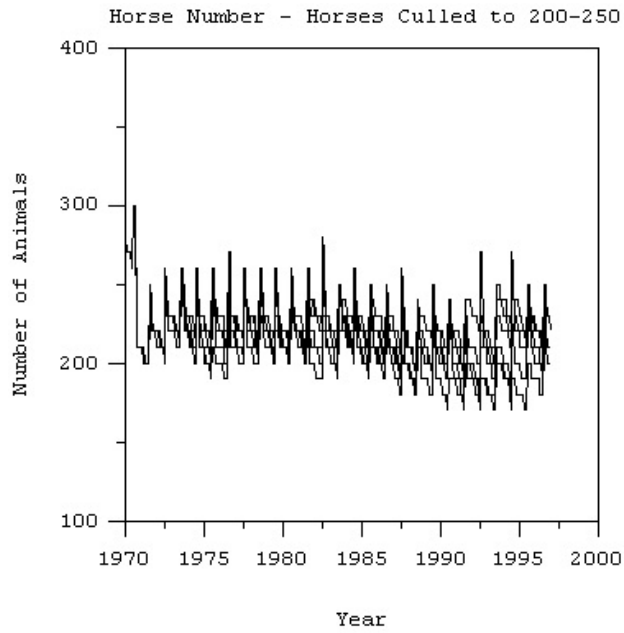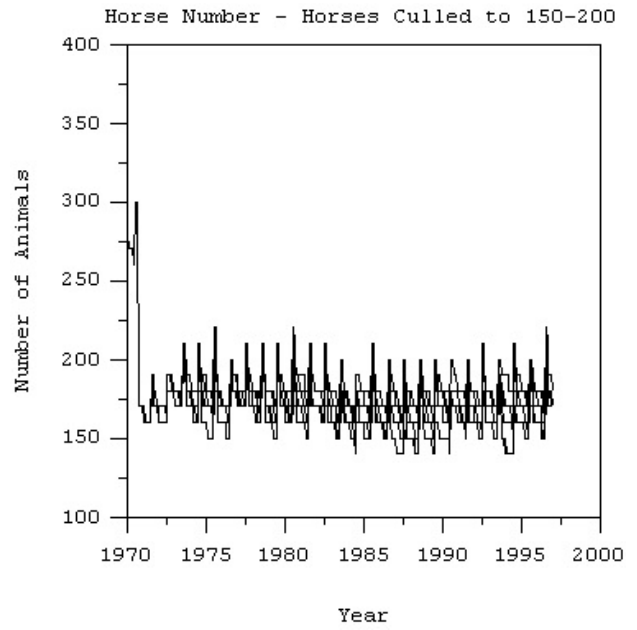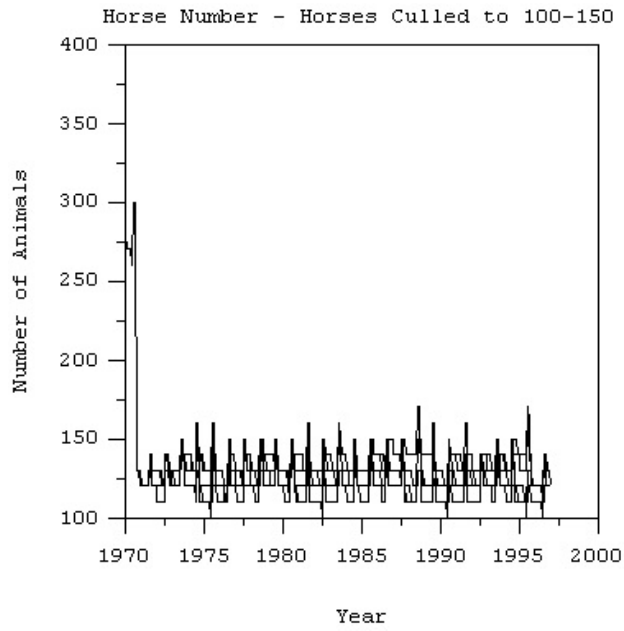
Figure 86. Horse population trajectories with horses culled to 4 different levels, with 6 stochastic simulations for level.
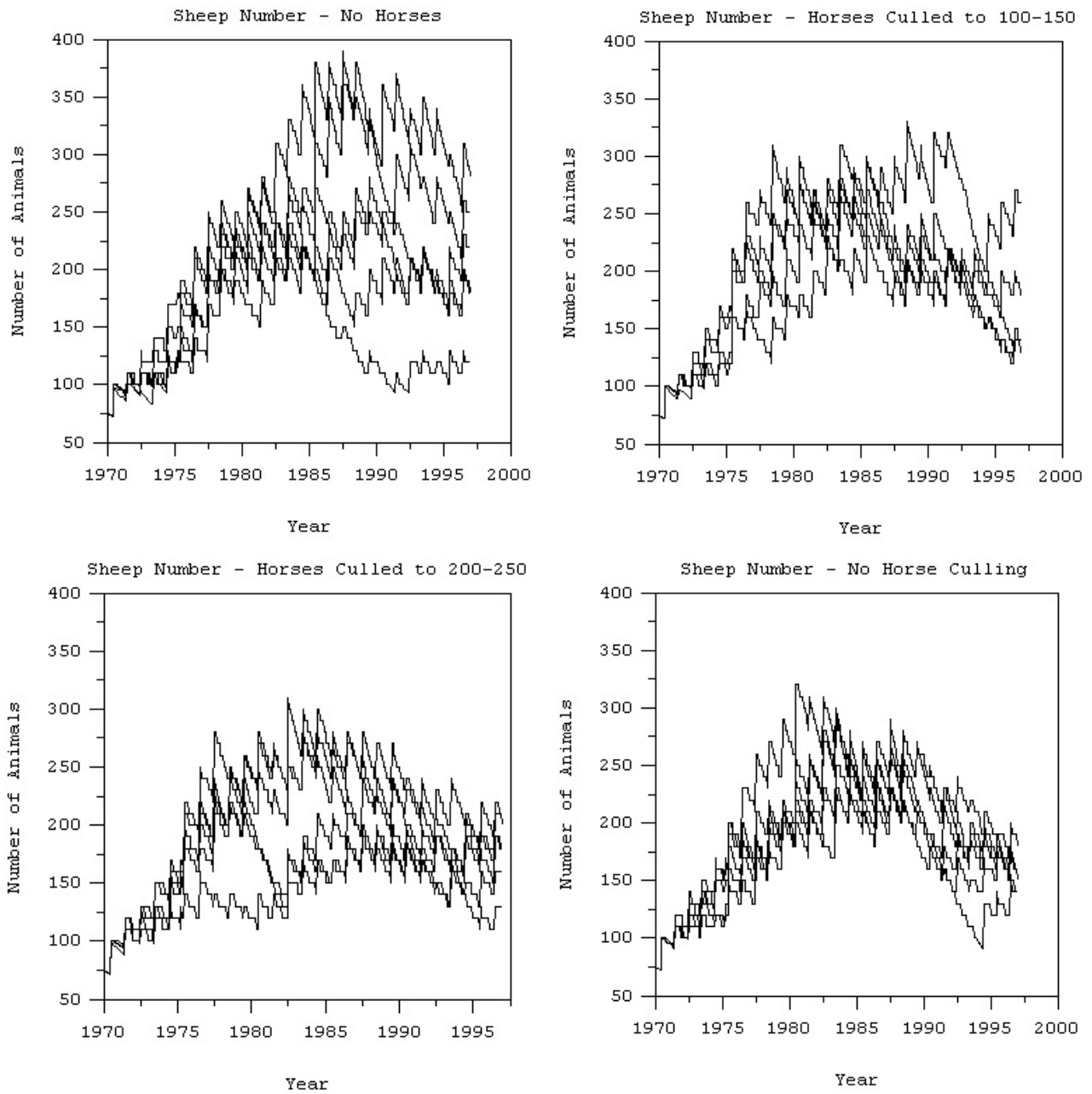
Figure 87. Sheep population trajectories with horses culled to 4 different levels, with 6 stochastic simulations for level.
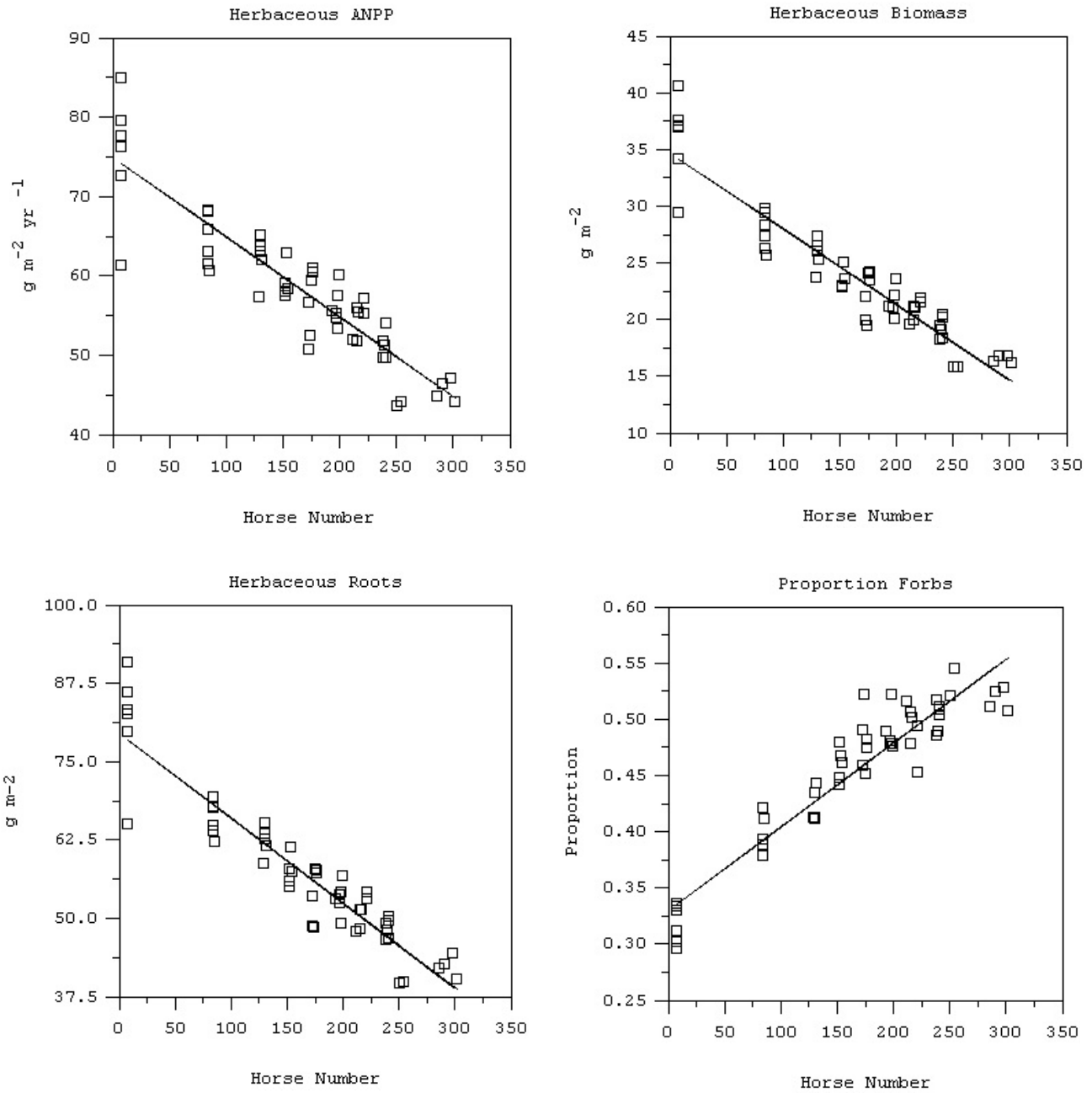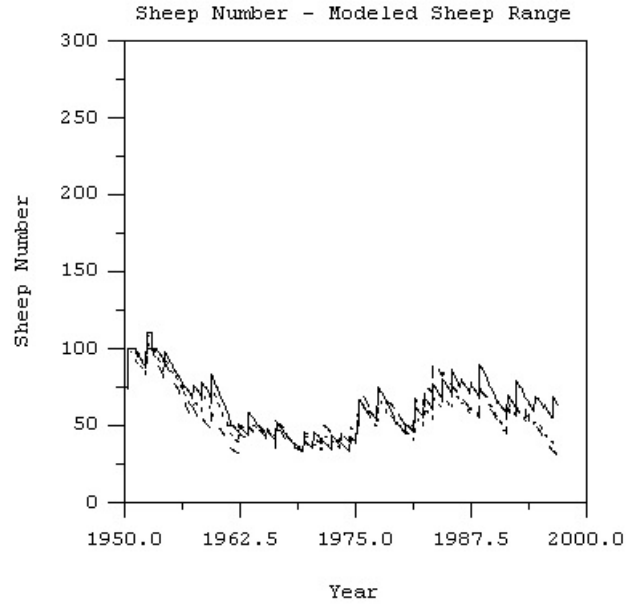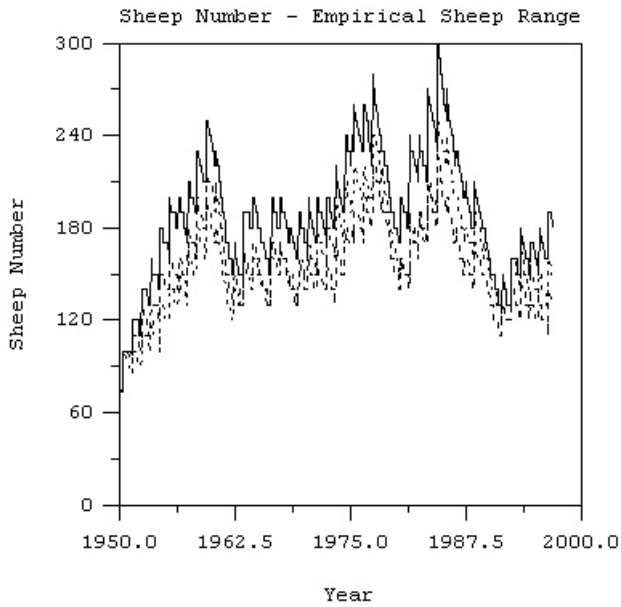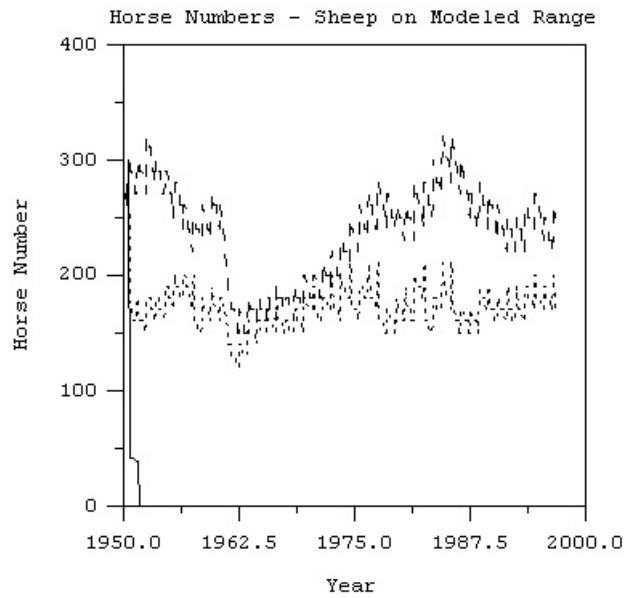
Figure 88. Herbaceous responses to culling horses to different levels (0,50,100,125,150,200,225) when they reach 50 more than the target, in 6 different stochastic simulations per culling level. See Figure 83 for explanations of variables.
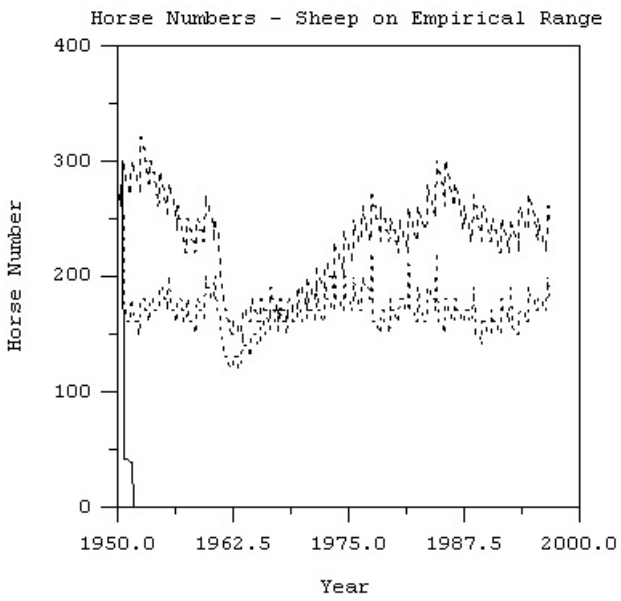
Figure 89. Horse and sheep condition with horses culled to 4 different levels, with 6 stochastic simulations for level.

Figure 90. Sheep and horse population responses to using either the empirical sheep range or the GIS modeled sheep range for sheep distributions, using weather data from 1950-1996.

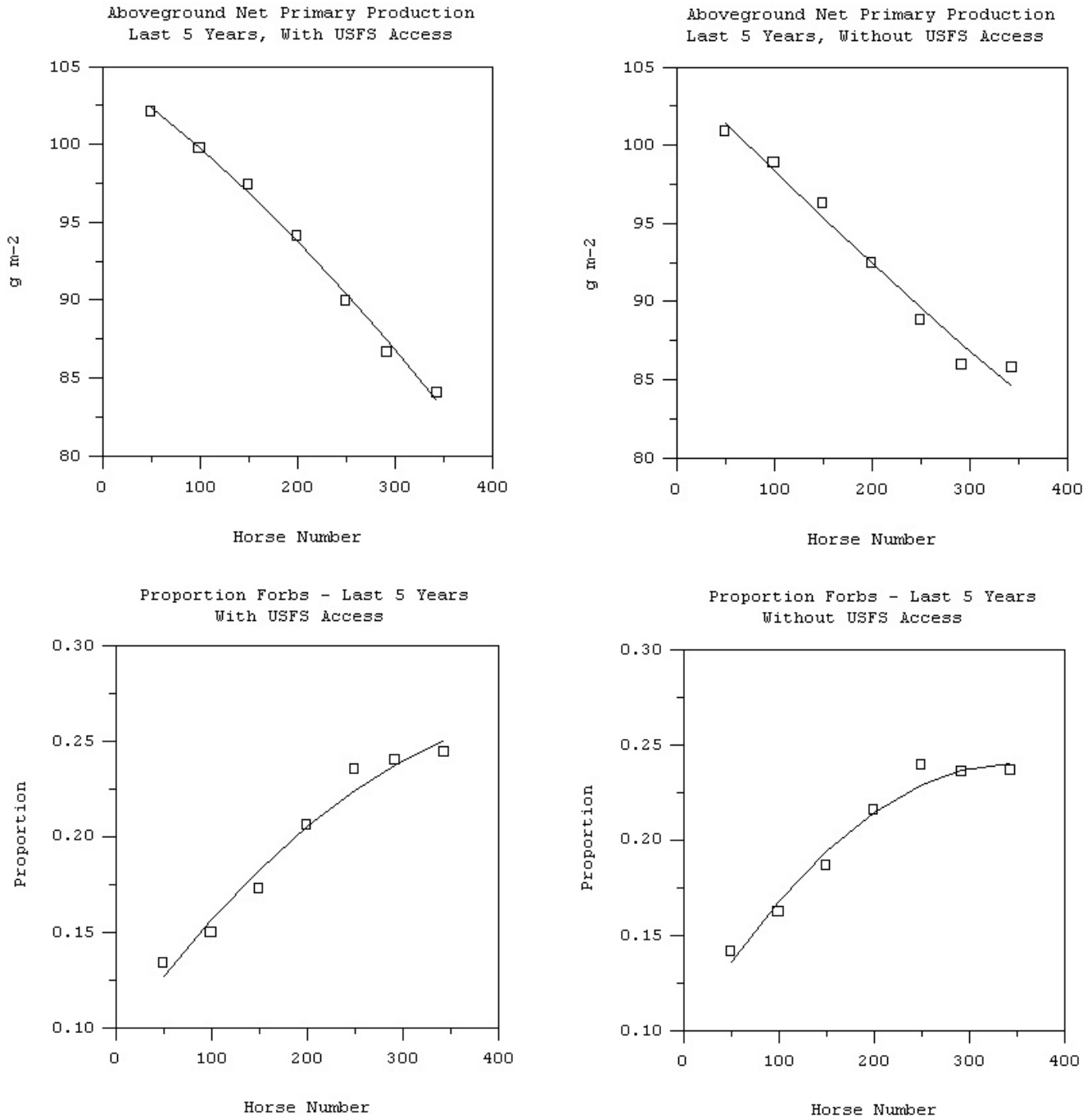Figure 91. Aboveground net primary production and proportion of forbs on the high elevation summer range inside the PMWHR boundaries, with and without access to the USFS lands outside the PMWHR. ANPP and forb proportion are means over the last 5 years of a 27 year simulation.
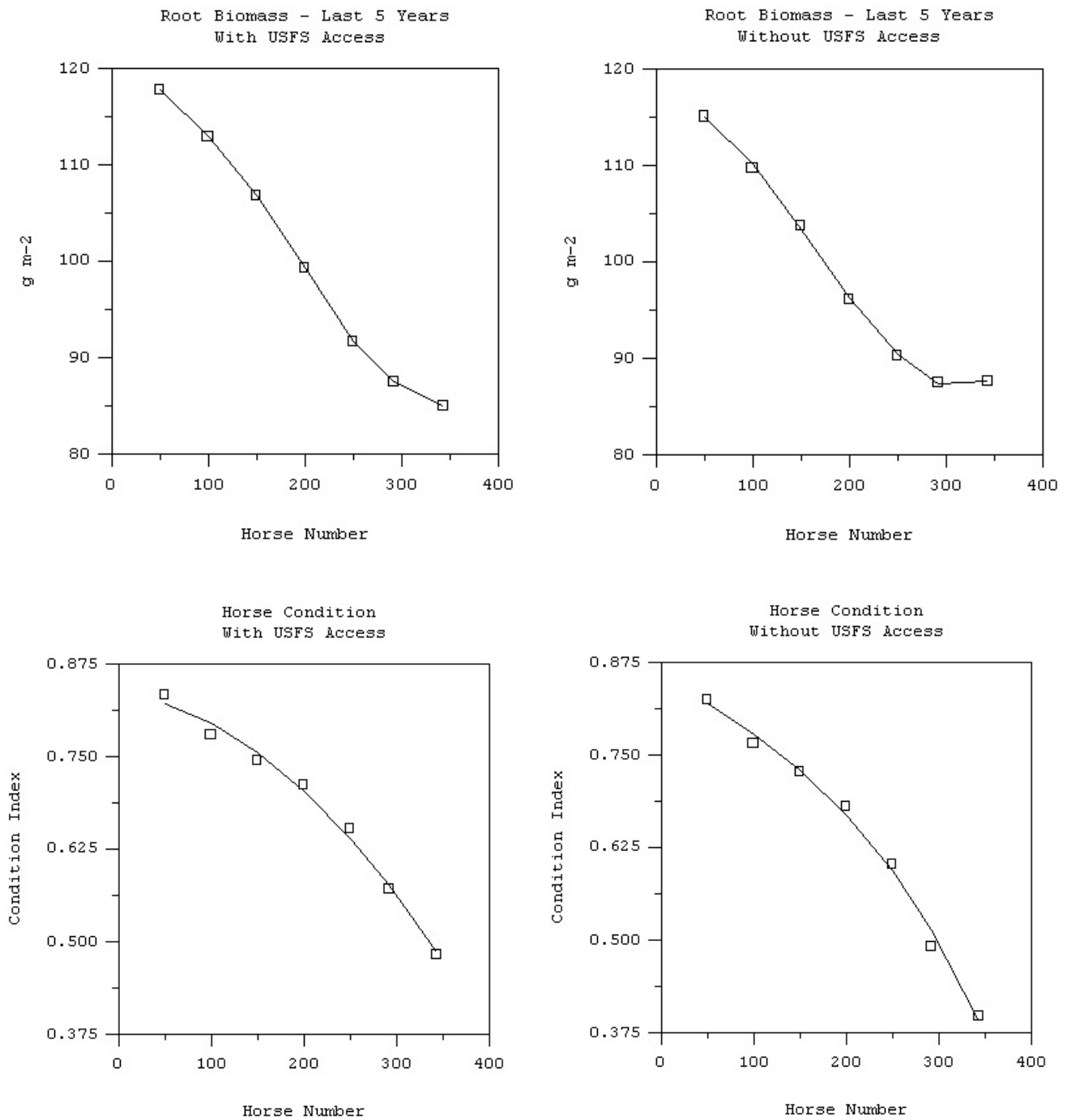
Figure 92. Root biomass in on the high elevation summer range inside the PMWHR boundaries, and mean horse condition, with and without access to the USFS lands outside the PMWHR. Roots biomass is the mean of the last 5 years of a 27 year simulation.
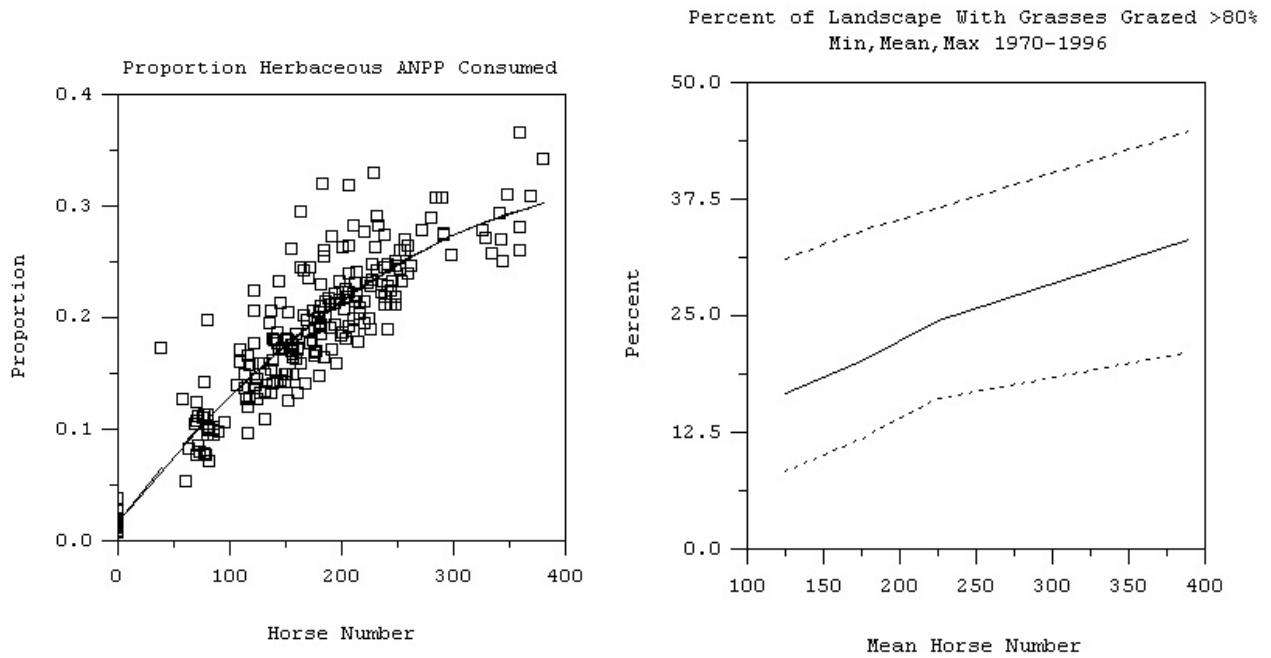
Figure 93. (A) Proportion of herbaceous aboveground net primary production consumed by horses, in relation to horse number. (B) Percent of the landscape where grasses are grazed in excess of 80%, showing the minimum, mean, and maximum values among years 1970-1996. Data for both figures were obtained from the simulation experiment in which horses were culled to different levels according to a culling rule (Figures 85,88).