Appendix E

Research Trends Analysis

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During scoping, several commenters suggested that selection of the benefits-sharing alternative (Alternative B) could affect the quantity of research activities in parks, either by attracting or discouraging scientific research activities undertaken by bioprospectors. These possibilities were analyzed, and the results are presented in this appendix. This analysis acknowledged that bioprospecting research has always been allowed in parks under the same regulations that control all types of scientific research activities, and that implementation of benefits-sharing as proposed in Alternative B would not change the criteria by which all scientific research permit applications are evaluated.

Four datasets were examined to determine whether there had been a measurable impact on the quantity of research in parks after the announcement of the Yellowstone–Diversa benefits-sharing agreement in 1997. Because the Yellowstone–Diversa agreement was entered into in 1997, the pre-benefits-sharing time period was defined as 1992–1997. The post-benefits-sharing time period was defined as 1998–2001. The four datasets included:

- The quantity of Scientific Research and Collecting Permits issued by Yellowstone, 1992–2001;
- The quantity of research reports (Investigator's Annual Reports) submitted to Yellowstone, 1992–2001;
- The quantity of research reports submitted to the 38 parks that received at least one research report each year, 1992–2001 (these parks accounted for half (50.3%) of all the research reports received by the National Park Service during this period); and
- The quantity of research reports submitted to a total of 270 parks servicewide, 1992–2001.

For each dataset, the number of research reports submitted (or, in one case, Scientific Research and Collecting Permits issued) was determined for each year from 1992 through 2001. A chi-square test was performed to determine if the null hypothesis ("There was no change in the number of reports/permits after 1997 compared to before 1997") could be rejected. This test detected no significant difference in the number of research projects conducted for any dataset between the pre-benefits-sharing and post-benefits-sharing time periods. Thus, the null hypothesis could not be rejected, that is, there is no evidence that the announcement or publicity surrounding the 1997 Yellowstone–Diversa agreement resulted in either an increase or decrease in National Park Service research reports or permits, and the fluctuations in the quantity of independent research activities in National Park Service units during the 10-year period 1992–2001 showed no significant trends.

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Table E-1. Number of Scientific Research and Collecting Permits issued by Yellowstone, 1992–2001

Year	Number of permits
1992	308
1993	220
1994	223
1995	286
1996	271
1997	290
1998	240
1999	237
2000	259
2001	234

Table E-2. Chi-square calculation, the number of Scientific Research and Collecting Permits issued by Yellowstone, 1992–2001, and 1992–1997 compared to 1998–2001

Average permits 1998–2001 (after CRADA)	243
Average permits 1992–1997 (before CRADA)	266
Observed minus expected ("after minus before")	-24
Squared	568
Divided by expected (chi-square value)	2.13277013

Table E-3. Number of research reports (IAR) submitted to Yellowstone, 1992–2001

Year	Number of reports
1992	227
1993	220
1994	208
1995	196
1996	191
1997	187
1998	190
1999	200
2000	171
2001	178

Table E-4. Chi-square calculation, the number of research reports (IAR) submitted to Yellowstone, 1992–2001, and 1992–1997 compared to 1998–2001

Average reports 1998–2001 (after CRADA)	185
Average reports 1992–1997 (before CRADA)	205
Observed minus expected ("after minus before")	-20
Squared	403
Divided by expected (chi-square value)	1.9691145

Table E-5. Number of research reports (IAR) submitted to 38 parks, 1992–2001

Year	Number of reports
1992	1,024
1993	1,027
1994	1,016
1995	917
1996	1,140
1997	1,122
1998	1,032
1999	1,132
2000	1,023
2001	899

Table E-6. Chi-square calculation, the number of research reports (IAR) submitted to 38 parks, 1992–2001, and 1992–1997 compared to 1998–2001

Average reports 1998-2001 (after CRADA)	1,022
Average reports 1992-1997 (before CRADA)	1,041
Observed minus expected ("after minus before")	-19
Squared	361
Divided by expected (chi-square value)	0.34678194

Table E-7. Number of research reports (IAR) submitted servicewide, 1992–2001

Year	Number of reports
1992	2,156
1993	2,108
1994	2,139
1995	1,692
1996	2,009
1997	2,075
1998	2,151
1999	2,362
2000	1,898
2001	1,947

Table E-8. Chi-square calculation, the number of research reports (IAR) submitted servicewide, 1992–2001, and 1992–1997 compared to 1998–2001

Average reports 1998–2001 (after CRADA)	2,090
Average reports 1992–1997 (before CRADA)	2,030
Observed minus expected ("after minus before")	60
Squared	3,600
Divided by expected (chi-square value)	1.773399015