

# A History of Forestry BMP Implementation Monitoring In Texas



Results from 15 years of BMP  
Implementation Monitoring

**TEXAS FOREST SERVICE**

A Member of the Texas A&M University System

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# **A History of Forestry BMP Implementation Monitoring in Texas**

*Results from 15 years of BMP Implementation Monitoring  
1990 - 2005*

by

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## **TEXAS FOREST SERVICE**

Forest Resource Development  
Best Management Practices Project

Prepared in Cooperation With the  
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and  
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## **EXECUTIVE SUMMARY**

For over 15 years, the Texas Forest Service has promoted the use of voluntary Best Management Practices (BMPs) to prevent any potential water quality impacts from occurring on forestry operations. In the early 1990s, a monitoring program was established throughout East Texas to determine the level of implementation with these environmental practices. Since the development of this program, six rounds of monitoring (1992, 1996, 1998, 2000, 2002, and 2005) have been conducted. A total of 904 sites were monitored between July 1, 1991 and July 1, 2005 and are believed to be a representative sample of the forestry activities that occurred in East Texas during that time.

Results from the past 15 years of BMP implementation monitoring were compiled and analyzed. This was done to determine the level of improvement that has occurred since the initial survey. Strengths and weaknesses were also identified so future educational efforts can target the areas that will have the greatest impact on BMP implementation.

General observations over the past 15 years:

- overall BMP implementation is at an all time high (91.7%)
- implementation was highest on landings, permanent roads, wetlands, and site preparation
- implementation was lowest on stream crossings, temporary roads, and Streamside Management Zones (SMZs)

Progress noted over the past 15 years:

- overall BMP implementation increased by 21% since 1996
- temporary roads (+56%) had the greatest improvement
- significant gains were made in temporary crossings (+46%), permanent crossings (+36%), and SMZs (+29%)
- family forest owner BMP implementation increased by 29%

Weaknesses noted over the past 15 years:

- correct installation and restoration of temporary stream crossings
- stabilization of temporary roads to prevent erosion
- inadequate SMZ width

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## **BACKGROUND AND OBJECTIVES**

The Clean Water Act (CWA), as reauthorized in 1987, called for states to establish a program for development and implementation of Best Management Practices to reduce nonpoint source (NPS) water pollution. The Act also required states to develop methods for determining “BMP effectiveness,” including a measure of BMP implementation.

The Texas Silvicultural Nonpoint Source Pollution Project, funded by CWA Section 319(h) grants from the Environmental Protection Agency (EPA) through the Texas State Soil and Water Conservation Board (TSSWCB), requires that a monitoring program be conducted to document the level of voluntary implementation of BMPs and effectiveness of BMPs in reducing NPS pollution from silvicultural activities. Objectives of the monitoring program are to:

- 1) measure the degree of implementation of BMP guidelines by forest landowners, silvicultural contractors, forest industry, and government agencies
- 2) evaluate the effectiveness of BMPs as applied in the field and identify any weaknesses in the BMP guidelines

This report compiles and analyzes the findings of six rounds of BMP implementation monitoring for 904 sites evaluated between July 1, 1991 and July 1, 2005. Please refer to the Texas Forest Service publication *Voluntary Compliance with Forestry Best Management Practices in East Texas*, October 1992 for Round 1; March, 1996 for Round 2; April, 1998 for Round 3; September, 2000 for Round 4; November 2002 for Round 5; and October 2005 for Round 6.

## **DISTRIBUTION AND SELECTION OF IMPLEMENTATION MONITORING SITES**

To get a valid estimate of overall implementation with Forestry Best Management Practices in East Texas, monitoring sites were distributed regionally within East Texas and among all forestland ownership categories. Sites were selected to be representative of the distribution of all silvicultural activities across East Texas. The distribution of monitoring sites was based on the estimated annual timber harvest for each county as reported in the annual Texas Forest Service publication, *Harvest Trends*. Sixty percent of all monitored tracts were located in Southeast Texas. See Table 1.

Table 1. Distribution of Implementation Monitoring Sites by County.

<b>County</b>	<b>Number of Sites Monitored</b>
Anderson	13
Angelina	50
Bowie	14
Camp	6
Cass	48
Chambers	3
Cherokee	42
Franklin	4
Gregg	2
Grimes	5
Hardin	43
Harris	5
Harrison	32
Henderson	2
Houston	30
Jasper	54
Jefferson	2
Liberty	32
Marion	27
Montgomery	31
Morris	3
Nacogdoches	37
Newton	44
Orange	8
Panola	31
Polk	57
Red River	7
Rusk	25
Sabine	26
San Augustine	28
San Jacinto	22
Shelby	33
Smith	15
Titus	3
Trinity	34
Tyler	42
Upshur	16
Walker	23
Wood	5
<b>Total</b>	<b>904</b>

## **METHODOLOGY**

Randomly selected tracts, on which normal forestry operations had occurred, were monitored for BMP implementation. The Texas BMP Monitoring Checklist was used to conduct the site evaluations. This form consists of a series of Yes/No questions that are grouped into seven categories: permanent roads, temporary roads, stream crossings, SMZs, site preparation, landings, and wetlands. For simplification, each question was worded so that a positive answer was recorded with a “Yes,” while a negative answer, indicating a departure from BMP recommendations, was answered “No.”

Once the field data was collected, it was entered into a database for storage and retrieval. The database then computed the percent implementation, or grade, for the tract by dividing the number of “Yes” answers by the total number of applicable questions. Since this checklist has evolved over the years, all questions asked during a particular round were used to calculate the grade for that round and category, even if they were not asked in future rounds. Some questions asked in earlier rounds were paired with similar questions asked in later rounds for analysis.

Results from all site evaluations were combined and summarized by category and question to get a historical perspective. The data was then analyzed to see if any trends existed in overall BMP implementation rates, BMP categories, and individual questions.

## **RESULTS**

Between July 1, 1991 and July 1, 2005, TFS BMP foresters evaluated BMP implementation on 904 sites, totaling 108,429 acres throughout East Texas. These tracts are geographically represented by ownership category in Figure 1. Overall BMP implementation rates by round, shown in Figure 2, have increased by 20% and are at an all time high (91.7%). Figure 3 shows the overall BMP implementation by category. Tabulated results by question on the BMP implementation monitoring checklist are located in the respective table for each category.

### **SITE CHARACTERISTICS**

Four hundred seventy-four of the 904 sites (52%) were on family forest lands, and over half of these were considered to be absentee landowners. Three hundred forty-nine tracts (39%) were owned by forest industry. Sixty (7%) sites were on publicly owned lands and 21 (2%) were owned by Timberland Investment Management Organizations (TIMOs). The percentage of this final category is sure to increase in the future due to this group’s acquisition of 2.5 million acres in the last five years.

Five hundred ninety two sites (65%) were monitored after a regeneration harvest. Two hundred twenty five thinning (25%) and 87 (10%) site preparation operations were evaluated. In 186 cases, the site preparation evaluation was included in elements of the preceding timber harvest operation or succeeding planting operation.

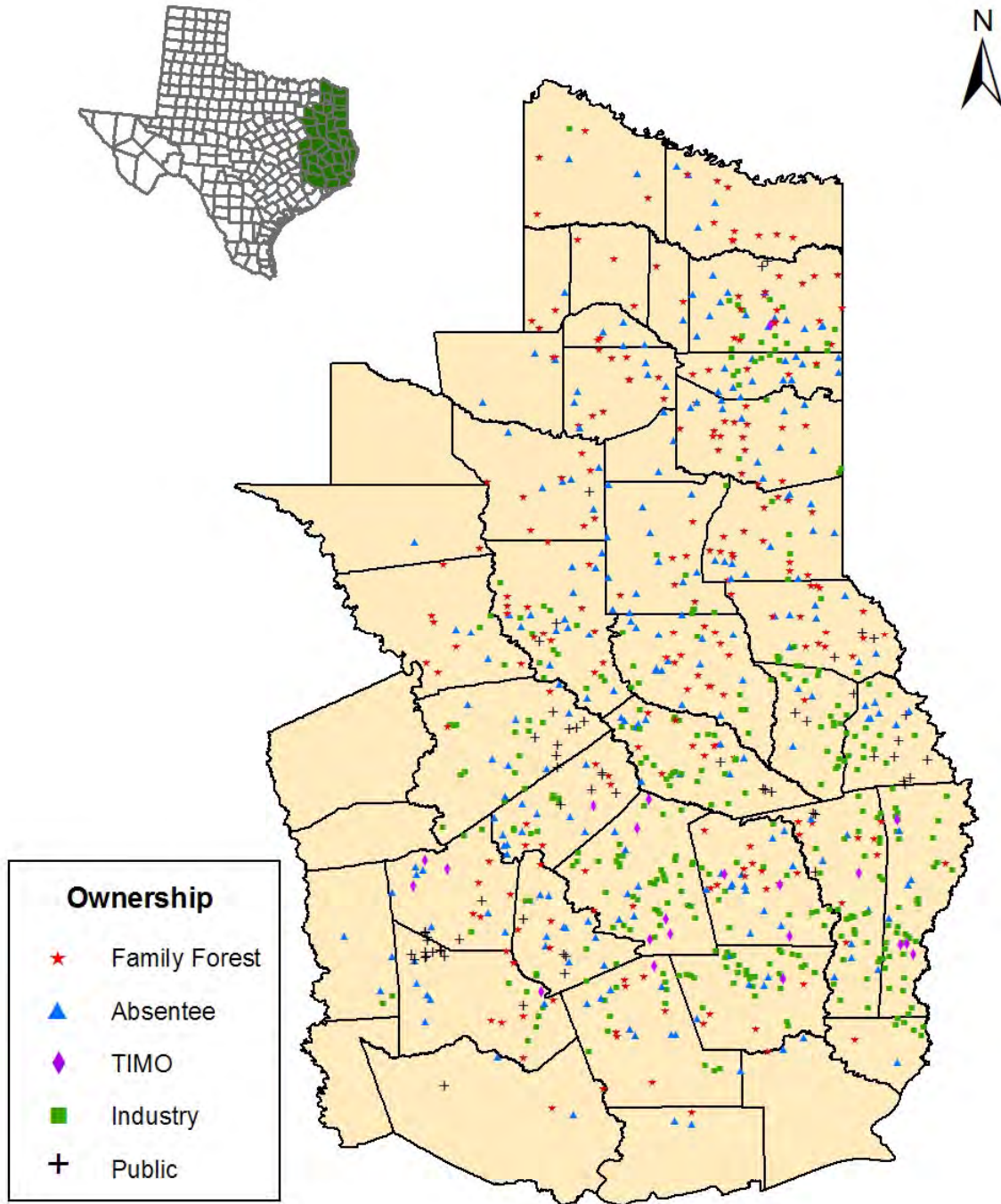
Professional foresters were involved in planning and/or implementing the silvicultural operation on 651 (72%) of the sites. Private consultants were involved on 223 sites. On 370 sites, the forester was employed by forest industry, while U.S. Forest Service and Texas Forest Service foresters were involved on 58 sites.

Terrain classification and soil erodibility were recorded from the Natural Resources Conservation Service (NRCS) Soil Survey, if available, or estimated by the forester in the field. Two hundred ninety-three sites (32%) were on flat terrain. Five hundred thirty-three sites (59%) were on hilly terrain and 78 (9%) were on steep terrain. Three hundred twenty-three sites (36%) were on soils with low erodibility, 415 sites (46%) on medium erodibility soils, and 166 (18%) were on high erodibility soils.

Of the 904 sites, 639 had either a perennial (200) or intermittent (335) stream or both perennial and intermittent (104). A permanent water body was found within 1,600 feet of 510 sites (56%).



**Figure 1. Site Locations by Ownership Category.**



**Figure 2. Overall BMP Implementation by Round (1992 - 2005)**

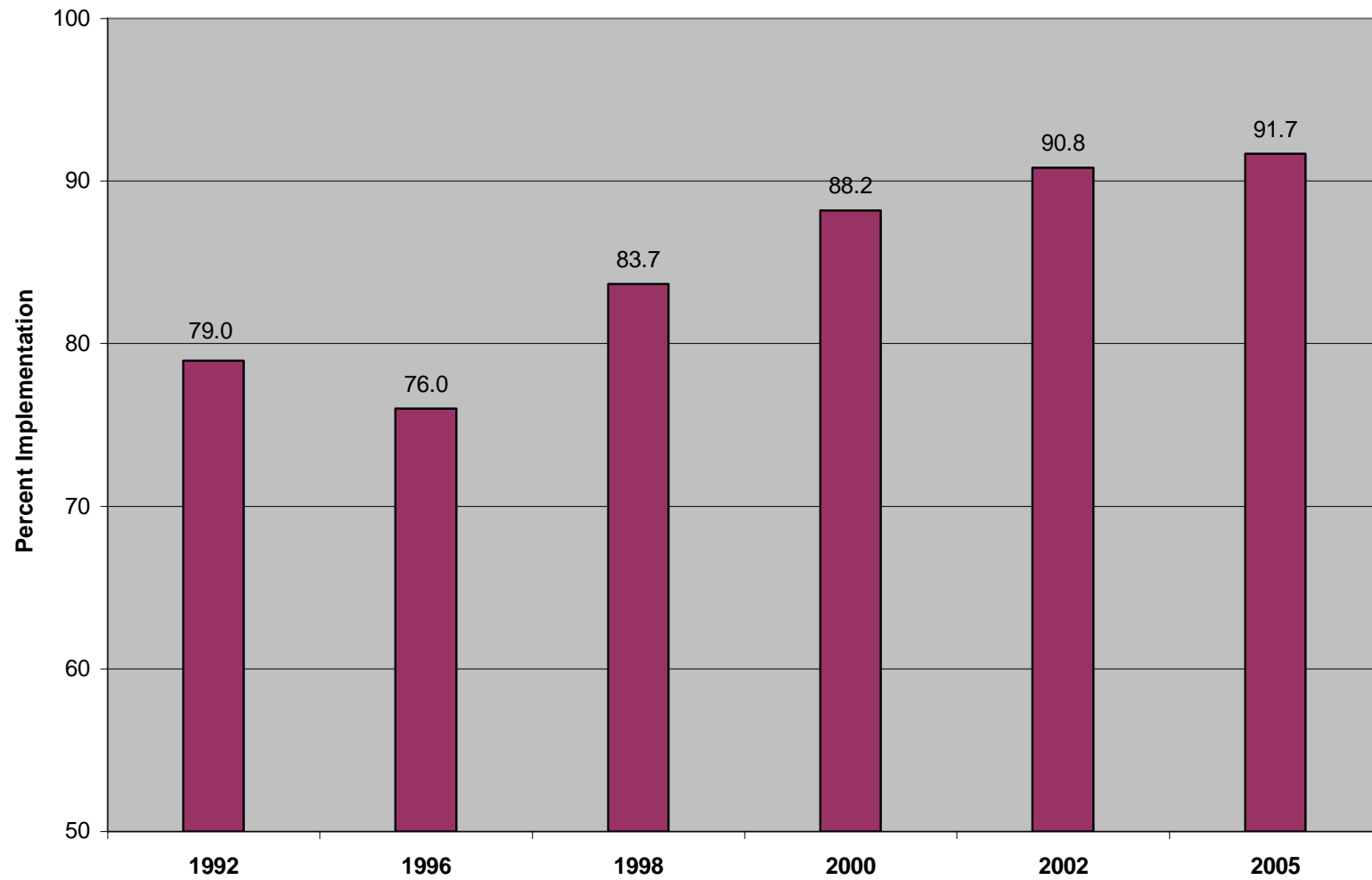
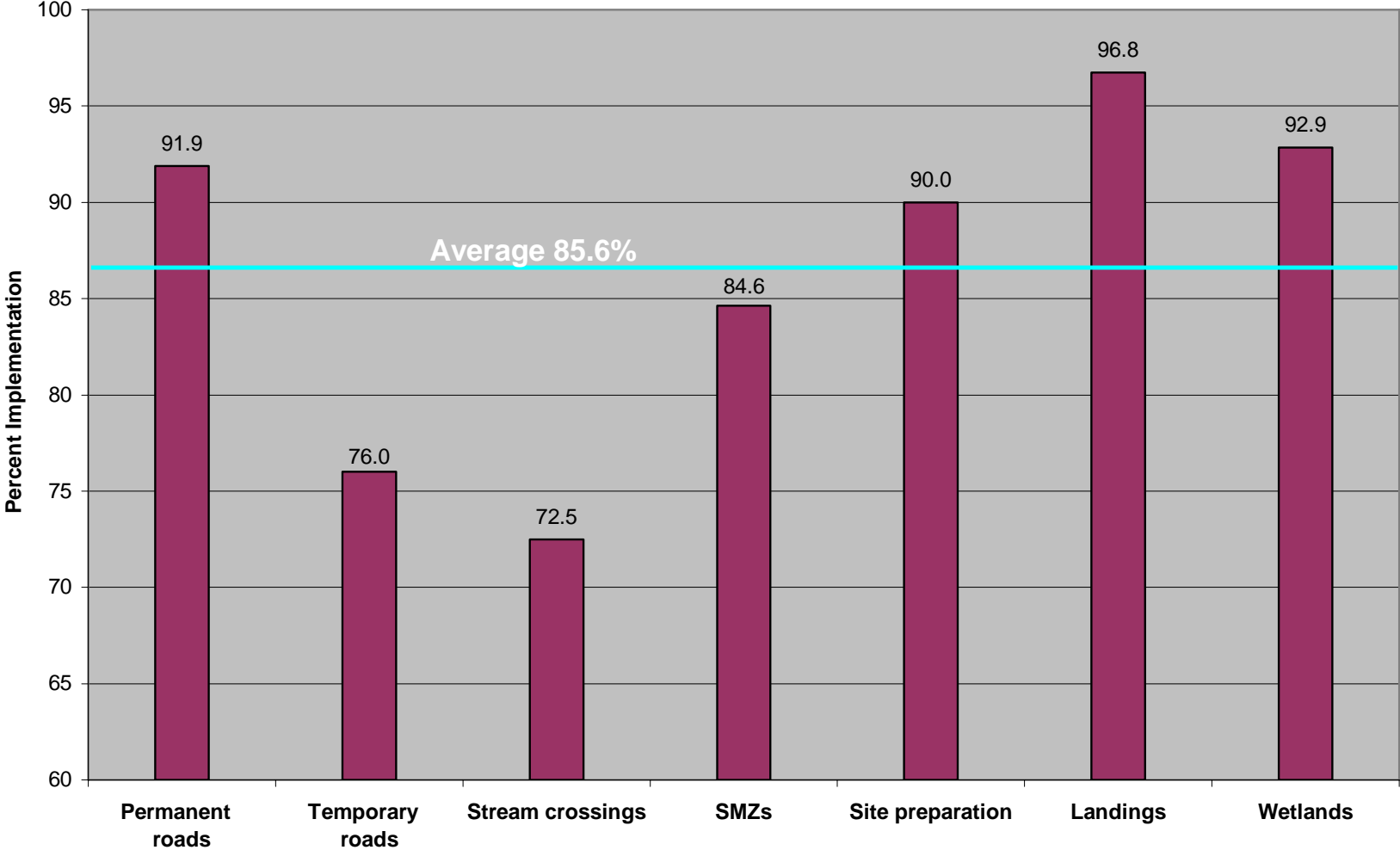


Figure 3. BMP Implementation by Category (1992-2005)



## PERMANENT ROADS

Permanent roads in the forestry context are generally graded dirt roads that are used for year-round access. They were applicable on 574 of the 904 sites. The percent implementation for permanent roads was 91.9% and five water quality risks were noted. Historically, this category has ranked consistently high in terms of BMP implementation, with scores ranging from 88.4% - 94.1%, and are considered a strength in the monitoring program. The lowest implementation score in this category was for roads not being well drained with appropriate structures (82.2%). See Table 2, Figure 4 and Figure 5.

Table 2. Implementation of BMPs Relating to Permanent Roads.

BMP	Yes	No	N/A	% Implementation	Water Quality Risks	Margin of Error
Respect sensitive areas	564	10	330	98.3	0	1.1
Roads meet grade specifications	560	13	331	97.7	0	1.3
Rutting within allowable specs	507	21	376	96.0	1	1.7
Well drained with appropriate structures	438	93	373	82.5	3	3.3
Ditches do not dump into streams	392	38	474	91.2	0	2.7
BMPs effective*	183	31	234	85.5	0	4.8
Roads reshaped and stabilized	242	49	165	83.1	1	4.4
<b>Total</b>	<b>2886</b>	<b>255</b>	<b>2283</b>	<b>91.9</b>	<b>5</b>	

\* Question removed from checklist in 2000.

**Figure 4. Overall BMP Implementation on Permanent Roads (1992 - 2005)**

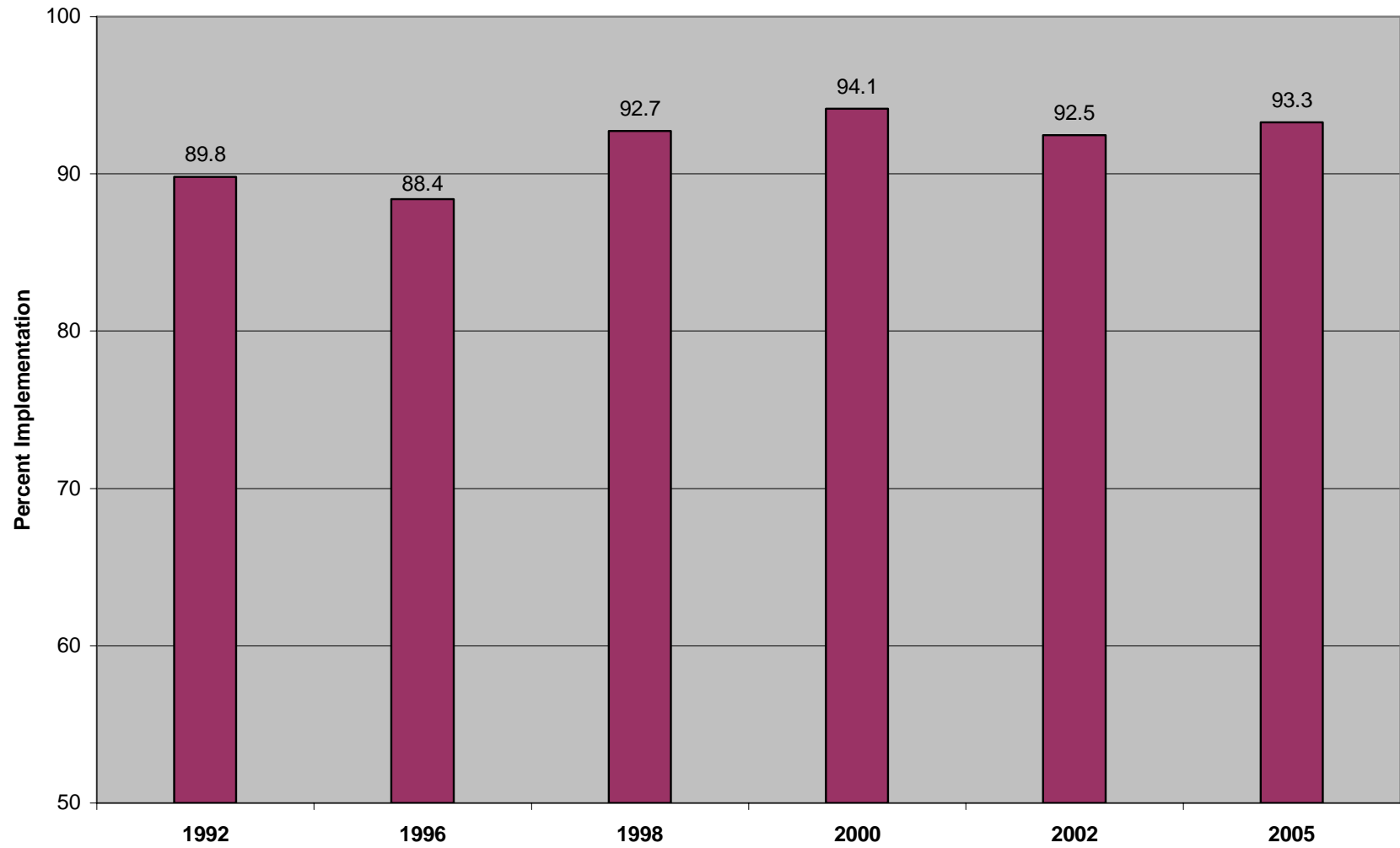
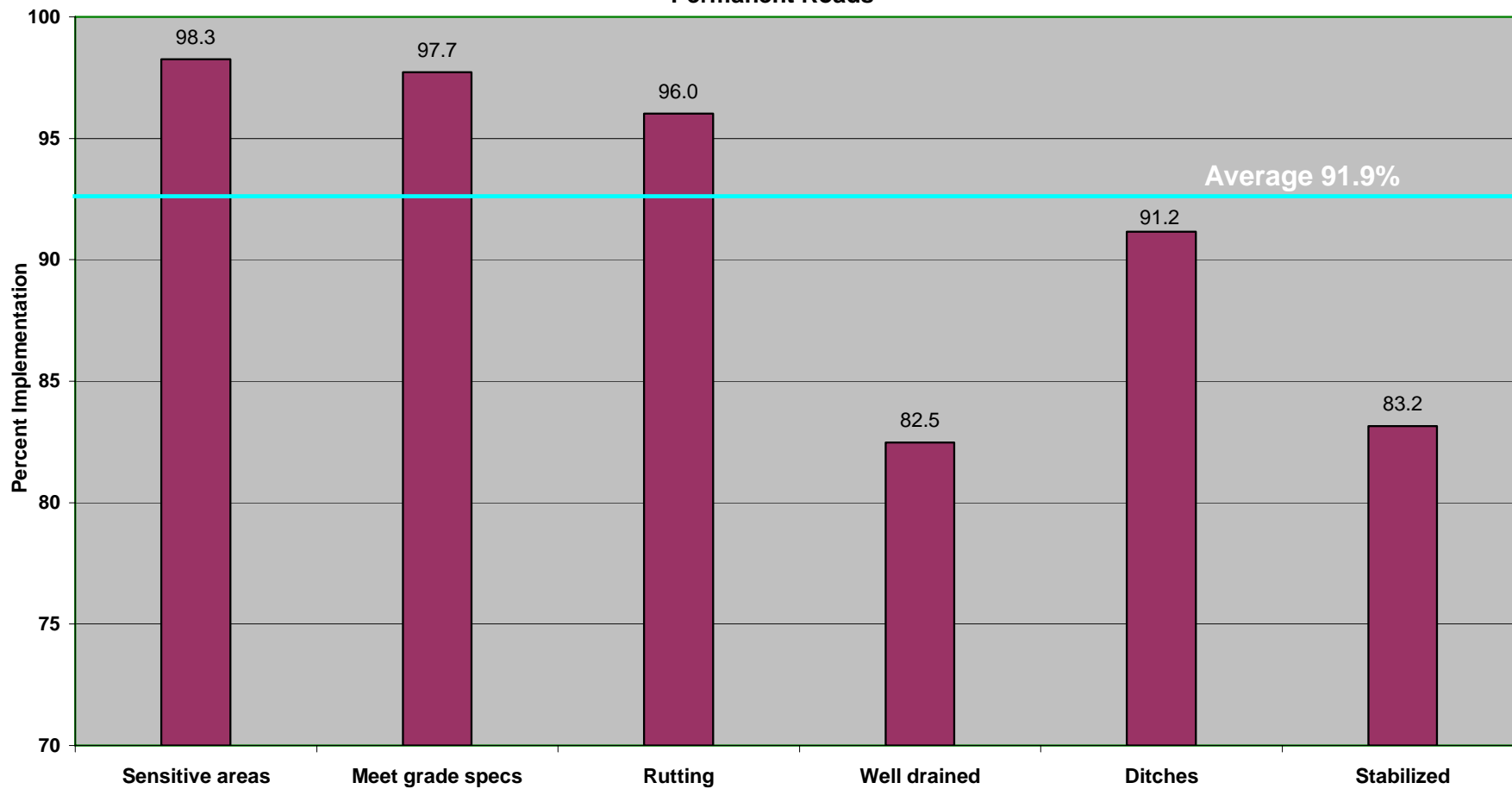


Figure 5. Overall BMP Implementation by Question (1992-2005)  
Permanent Roads



## SKID TRAILS AND TEMPORARY ROADS

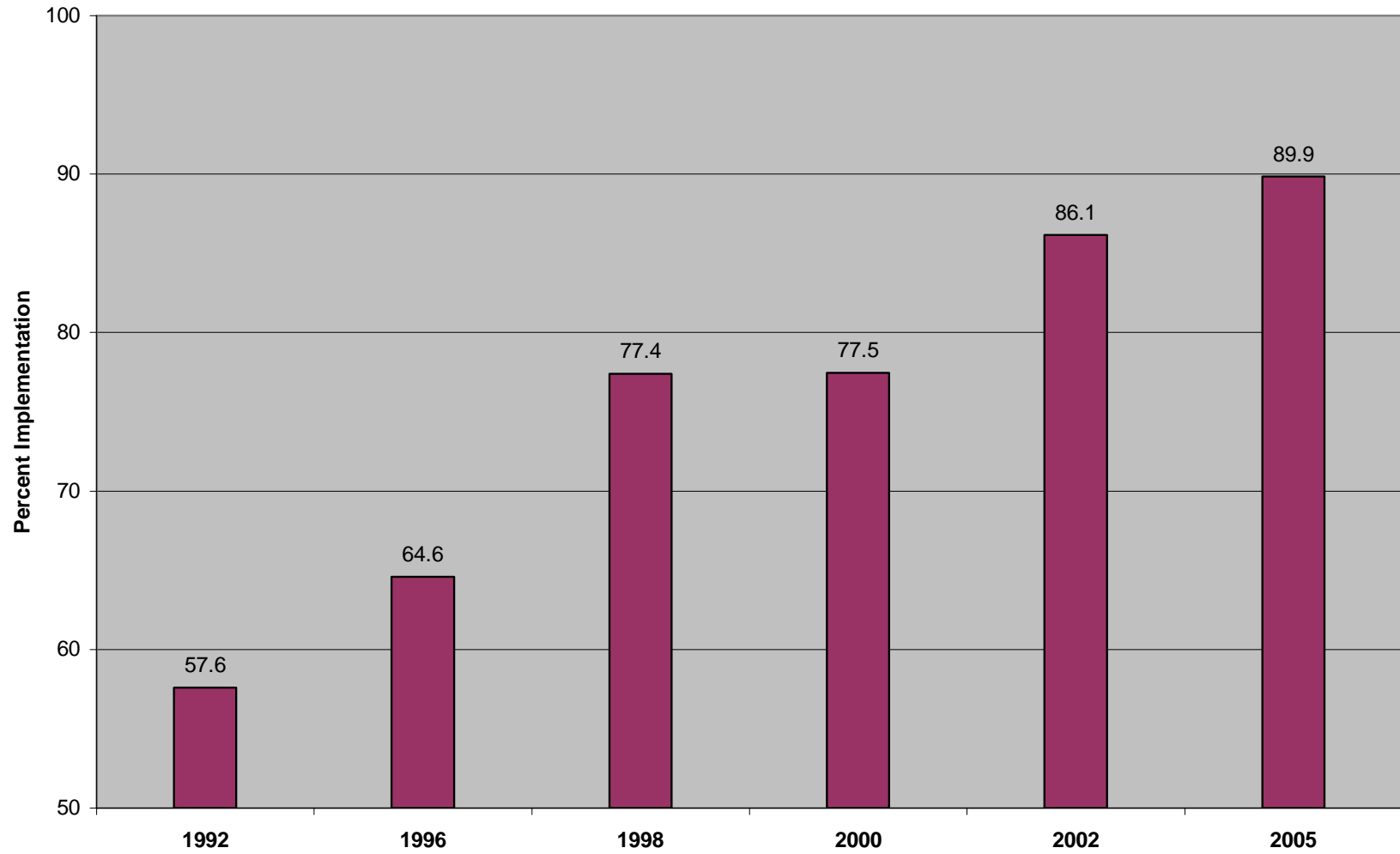
Skid trails are routes through the logging area in which logs are dragged to a permanent road or central loading point called a “landing.” Temporary roads are not designed to carry traffic long-term and are usually retired and reforested after the harvest. They were applicable on 720 of the 904 sites. The percent implementation for temporary roads was 76% and a total of 11 water quality risks were noted. This category has realized the greatest improvement (+56%) in BMP implementation of all categories. However, there is still room for improvement. Increased focus on ensuring that temporary roads are well drained (58.4%) and stabilized (75.7%) is the best way to improve this category’s score. It is important to note that the highest scores were for avoiding steep slopes and sensitive areas. Building roads under these conditions can lead to a higher erosion potential. See Table 3, Figure 6 and Figure 7.

Table 3. Implementation of BMPs Relating to Skid Trails and Temporary Roads.

BMP	Yes	No	N/A	% Implementation	Water quality Risks	Margin of Error
Slopes less than 15%	686	35	183	95.1	1	1.6
Respect sensitive areas	324	33	99	90.8	3	3.1
Well drained with appropriate structures	375	267	262	58.4	3	3.9
Roads stabilized	254	83	119	75.4	2	4.7
Rutting within allowable specs	573	97	234	85.5	2	2.7
Water bars evident*	96	209	143	31.5	0	5.3
Water bars working*	72	27	349	72.7	0	9.0
<b>Total</b>	<b>2380</b>	<b>751</b>	<b>1389</b>	<b>76.0</b>	<b>11</b>	

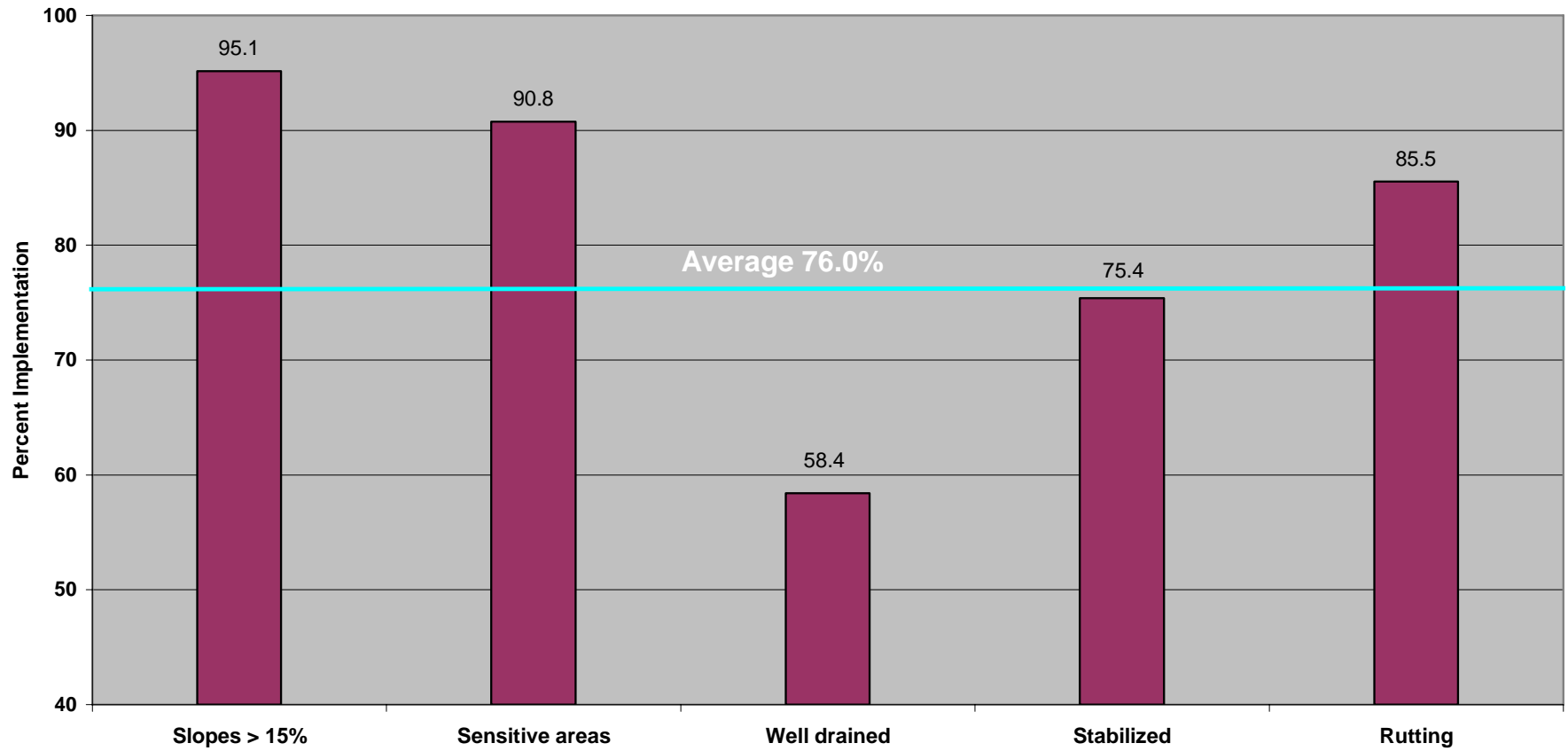
\* Questions were consolidated into “Well drained with appropriate structures” in 2000.

**Figure 6. Overall BMP Implementation on Temporary Roads (1992-2005)**





**Figure 7. Overall Compliance by Question (1992-2005)  
Temporary Roads/Skid Trails**



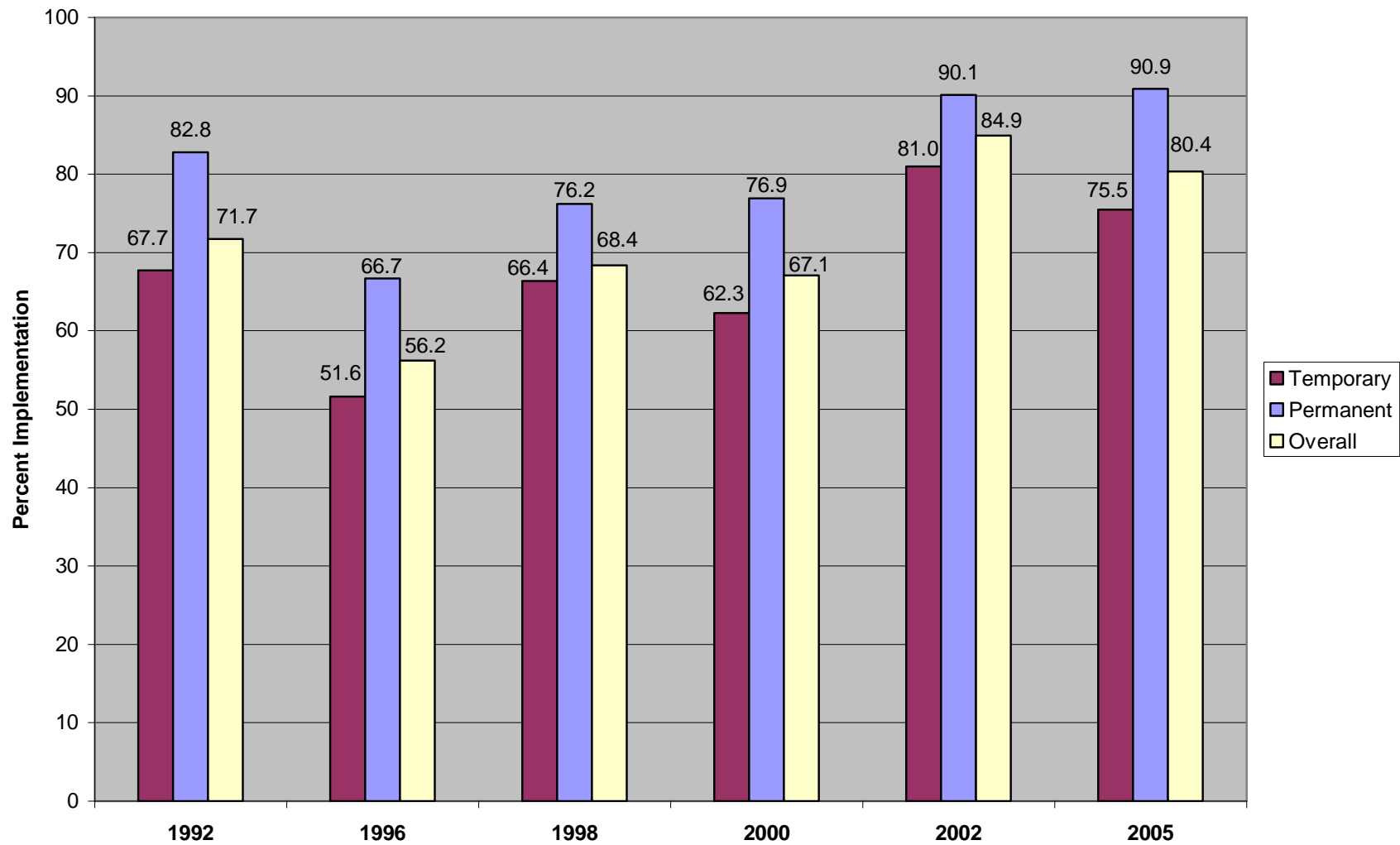
## STREAM CROSSINGS

Stream crossings were evaluated on 490 sites. One hundred-eleven sites had crossings on permanent roads only, 233 had crossings on temporary roads only, and 146 had crossings on both permanent and temporary roads. The percent implementation for stream crossings was 72.7% and a total of 24 water quality risks were noted. This category has shown tremendous improvement in BMP implementation (+43%) over the past 15 years, with scores ranging from 58.2% - 84.9%. However, when compared to the 15-year overall average, this category is still shown as a weakness. BMP implementation is much higher on permanent stream crossings (82.6%) than temporary stream crossings (68%). Additional focus needs to be directed to restoring and stabilizing temporary and permanent crossings (34.8% and 76%, respectively) as well as ensuring that temporary crossings are installed correctly (63.7%). It is important to note that the highest score in this category was for minimizing the number of stream crossings on permanent and temporary roads. Operators are not installing unnecessary crossings. See Table 4, Figure 8, Figure 9, and Figure 10.

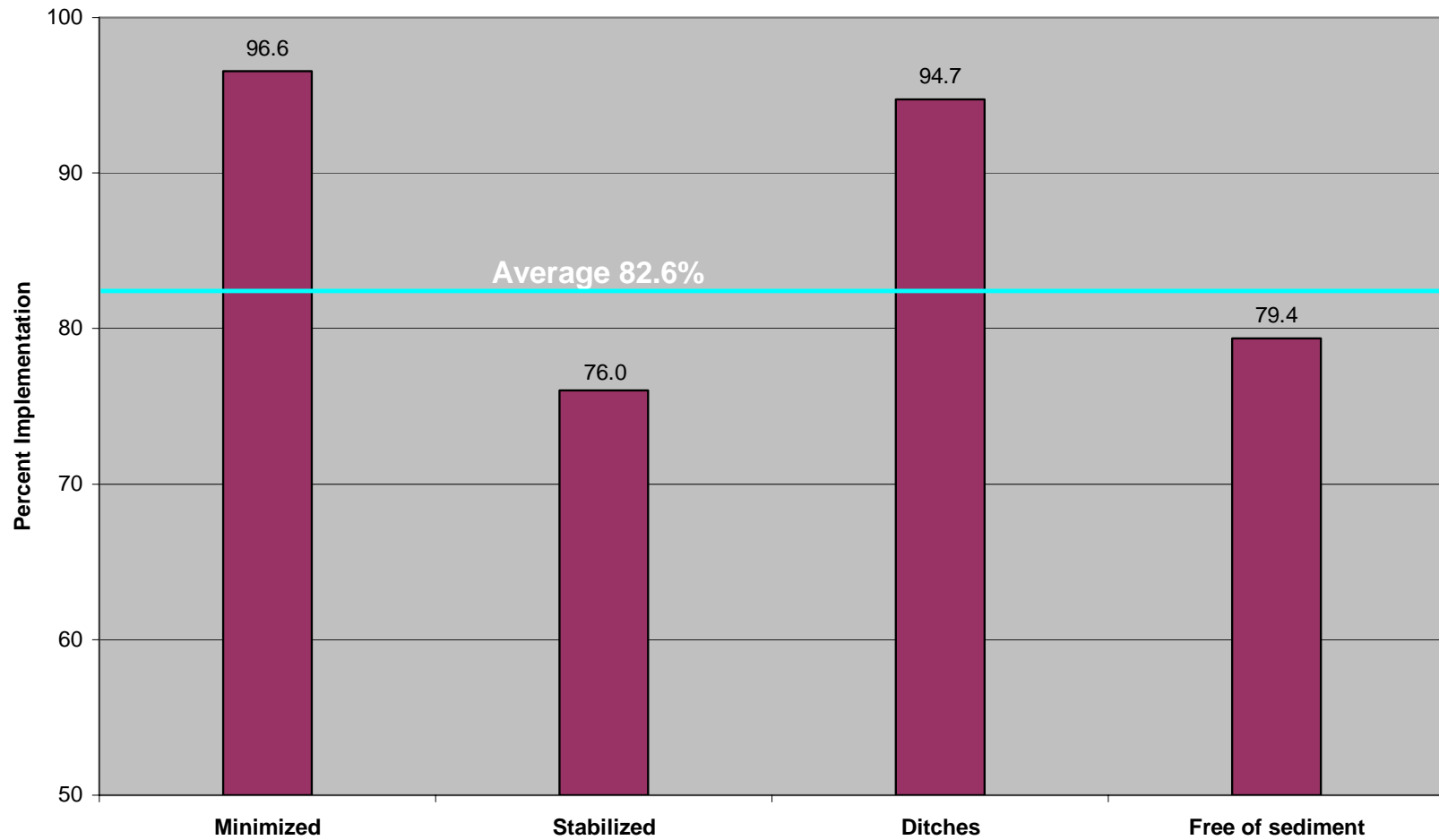
Table 4. Implementation of BMPs Relating to Stream Crossings.

BMP	Yes	No	N/A	% Implementation	Water quality Risks	Margin of Error
<i>Permanent Roads</i>						
Stabilized	149	47	708	76.0	6	6.1
Ditches do not dump into streams	72	4	380	94.7	0	5.1
Free of sediment	204	53	647	79.4	2	5.0
Crossings minimized	84	3	369	96.6	0	3.9
<b>Total</b>	<b>509</b>	<b>107</b>	<b>2104</b>	<b>82.6</b>	<b>8</b>	<b>-</b>
<i>Temporary Roads</i>						
Crossings minimized	310	59	535	84.0	3	3.8
Correct	174	99	631	63.7	0	5.8
Approaches at right angles	112	3	340	97.4	0	3.0
Restored / Stabilized	87	163	654	34.8	9	6.0
Free of sediment	259	120	525	68.3	4	4.8
<b>Total</b>	<b>942</b>	<b>444</b>	<b>2685</b>	<b>68.0</b>	<b>16</b>	<b>-</b>
<b>Overall Total</b>	<b>1451</b>	<b>551</b>	<b>4789</b>	<b>72.5</b>	<b>24</b>	<b>-</b>

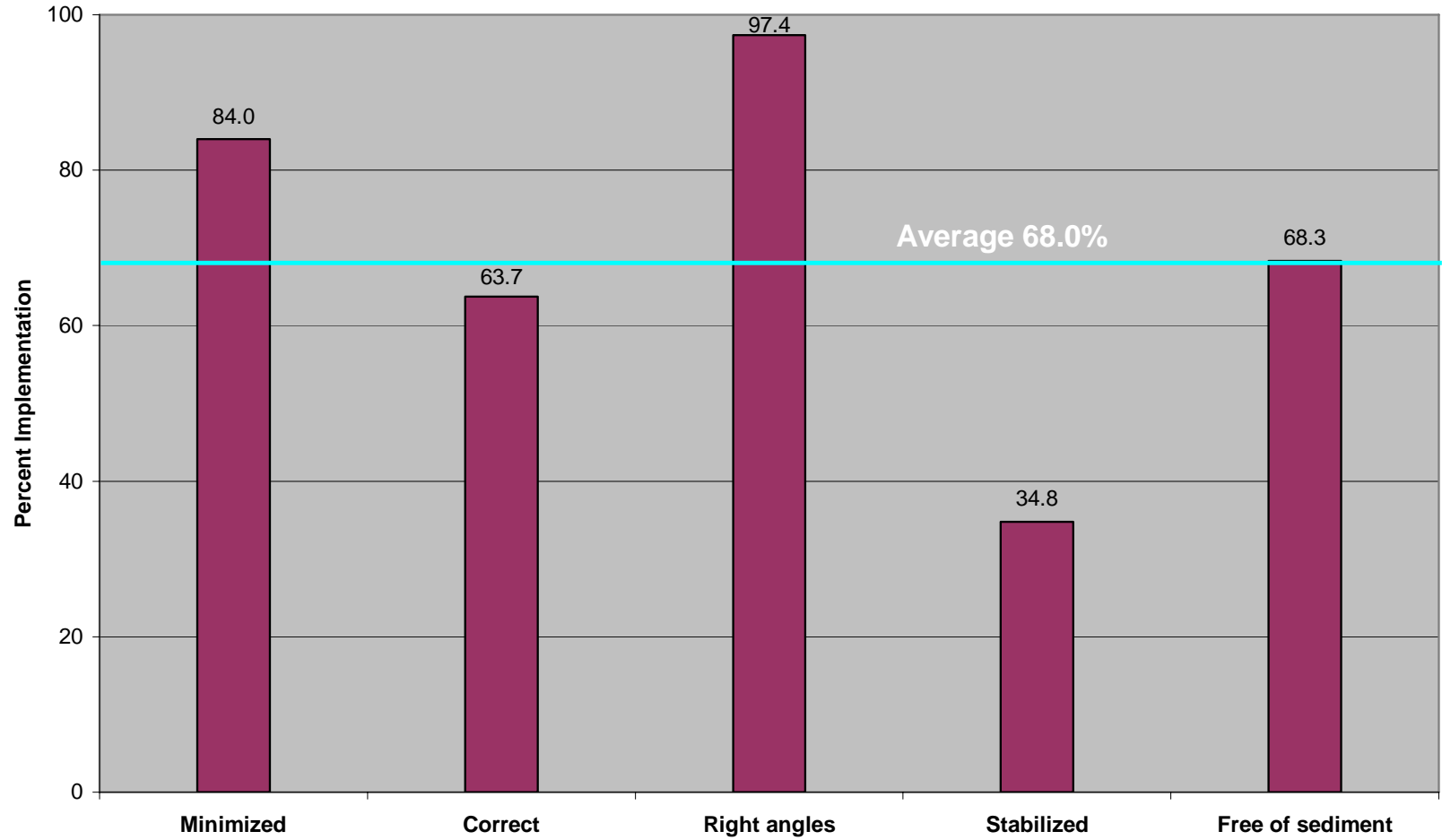
Figure 8. Overall BMP Implementation on Stream Crossings (1992 - 2005)



**Figure 9. Overall BMP Implementation by Question (1992-2005)  
Permanent Stream Crossings**



**Figure 10. Overall BMP Implementation by Question (1992-2005)  
Temporary Stream Crossings**



## STREAMSIDE MANAGEMENT ZONES

Streamside management zones (SMZs) are forested buffer strips immediately adjacent to the stream channel and are recommended on all perennial and intermittent streams, lakes, ponds, and reservoirs. SMZs were evaluated on 641 sites. The percent implementation of SMZs was 84.6% with 20 water quality risks noted. Over the years, this category has shown significant improvement in BMP implementation (29%), with scores ranging from 70.6% - 90.9%. The lowest score for this category was shown in 1996, the first survey year that the guidelines recommended leaving SMZs along intermittent streams. When compared to the 15-year overall average, this category could still use a little improvement, primarily in ensuring that these zones are adequately wide (78.2%) and the stream is clear of debris (79.7%). It is important to note that one of the highest scores in this category is for the presence of a SMZ on a perennial stream (91.1%). Landowners are protecting the direct links to our drinking water supplies. See Table 5, Figure 11, Figure 12.

Table 5. Implementation of BMPs Relating to SMZs.

BMP	Yes	No	N/A	% Implementation	Water quality Risks	Margin of Error
Present on perennial stream	277	27	600	91.1	2	3.3
Present on intermittent stream	405	92	407	81.5	6	3.5
Adequately wide	460	128	316	78.2	0	3.4
Thinning within allowable specs	378	85	441	81.6	0	3.6
Integrity honored	487	94	323	83.8	0	3.1
Stream clear of debris	511	130	263	79.7	9	3.2
Free of roads and landings	556	34	314	94.2	0	1.9
Stream free of sediment	569	72	263	88.8	3	2.5
<b>Total</b>	<b>3643</b>	<b>662</b>	<b>2927</b>	<b>84.6</b>	<b>20</b>	

**Figure 11. Overall BMP Implementation on SMZ's (1992 - 2005)**

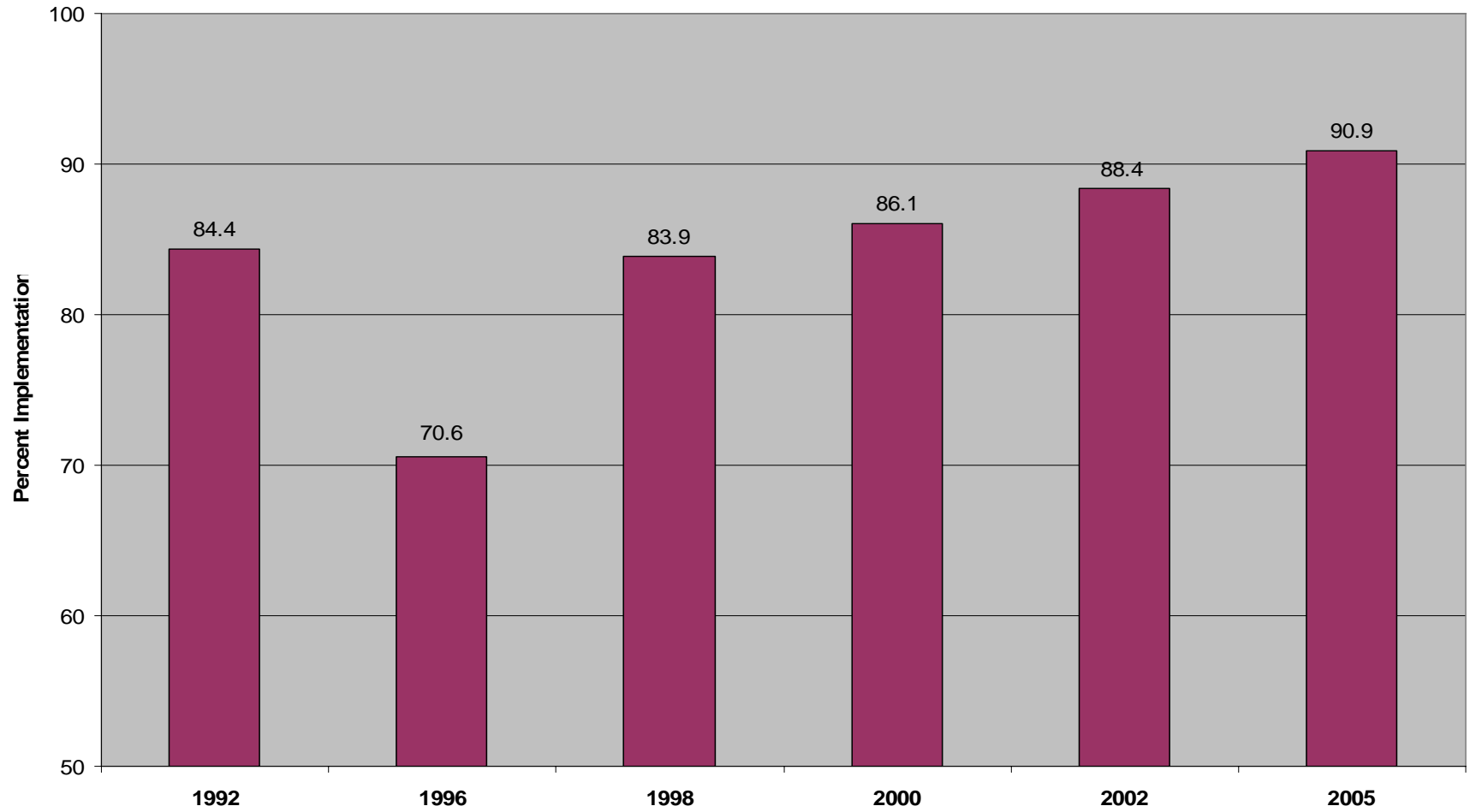
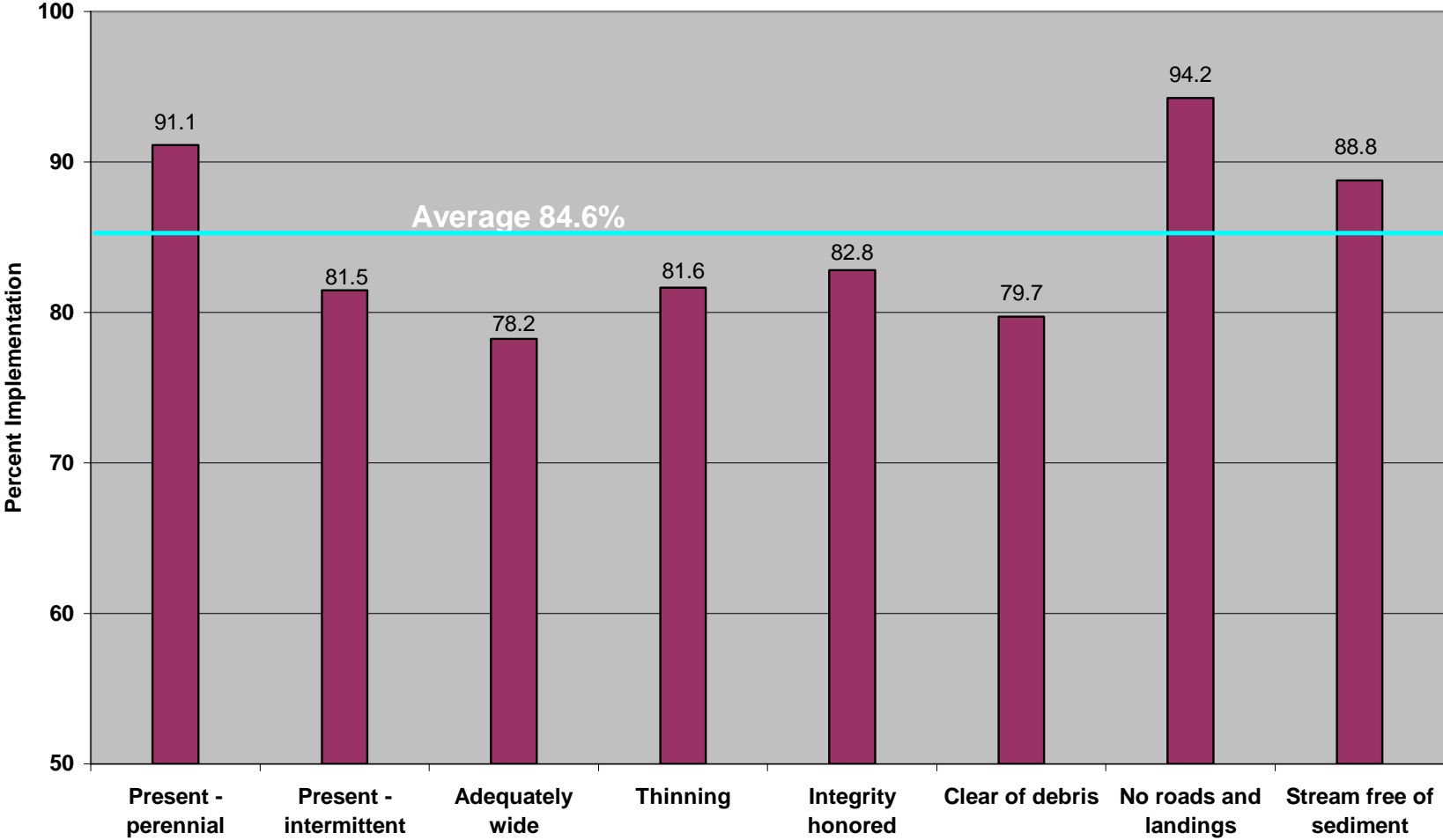


Figure 12. Overall BMP Implementation by Question (1992-2005)  
SMZs





## SITE PREPARATION

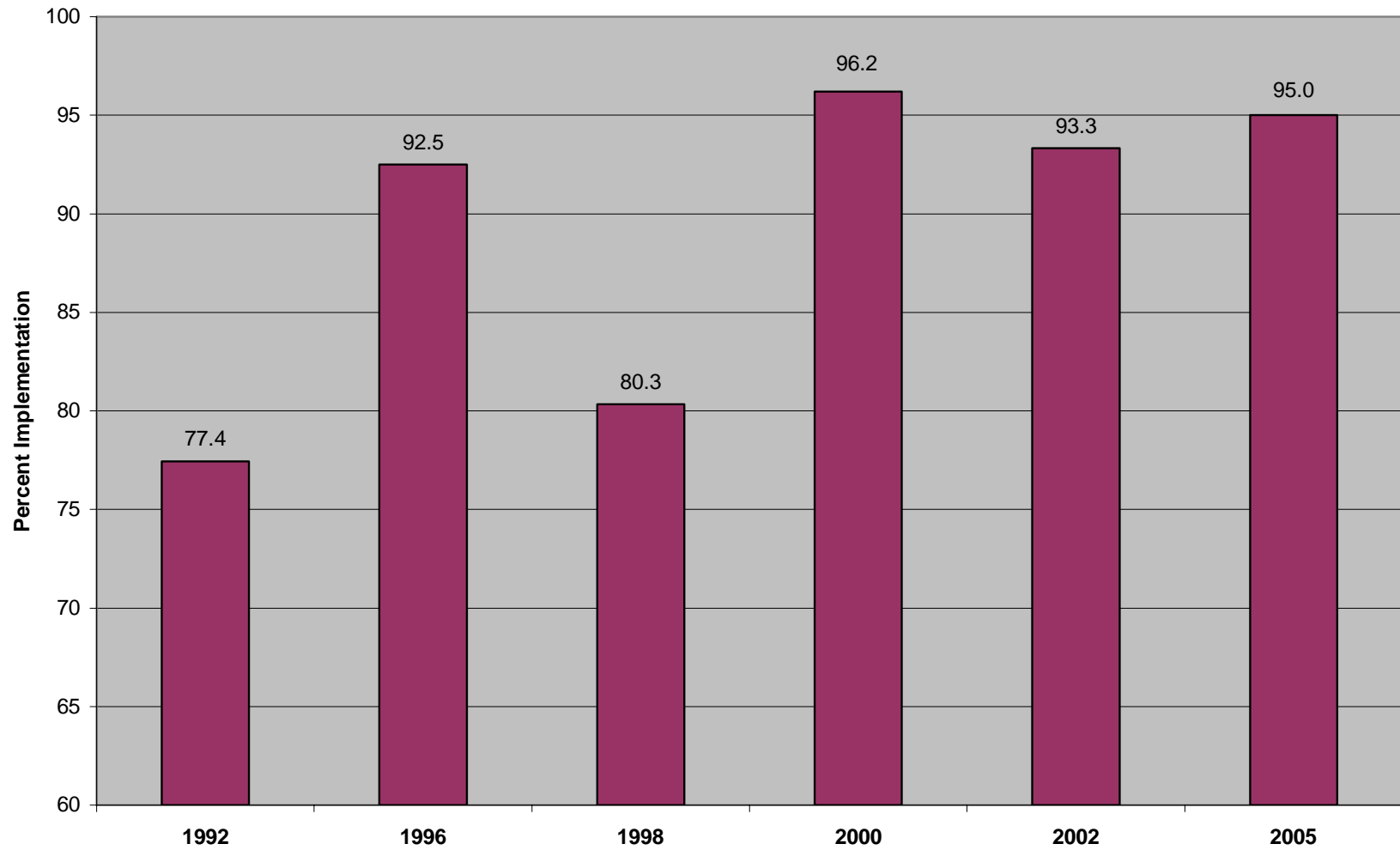
Site preparation is a process done to facilitate the regeneration of trees and may consist of chemical (herbicide) and/or mechanical operations (shear, windrow, bed, etc.). This practice was evaluated on 273 sites. The implementation for site preparation was 92.6% with 1 water quality risk noted. Historically, this category has shown significant improvement in BMP implementation (23%), with scores ranging from 77.4% – 95%, and is considered a strong point in our monitoring program. The lowest score in this category was for not machine planting on the contour (83.8%), which was only evaluated on 37 sites. It is important to note that the highest scores in this category were for preventing sediment (95.4%) and chemicals (97.1%) from reaching the stream or leaving the site. These operations are being conducted in a very environmentally sensitive manner. See Table 6, Figure 13, and Figure 14.

Table 6. Implementation of BMPs Relating to Site Preparation.

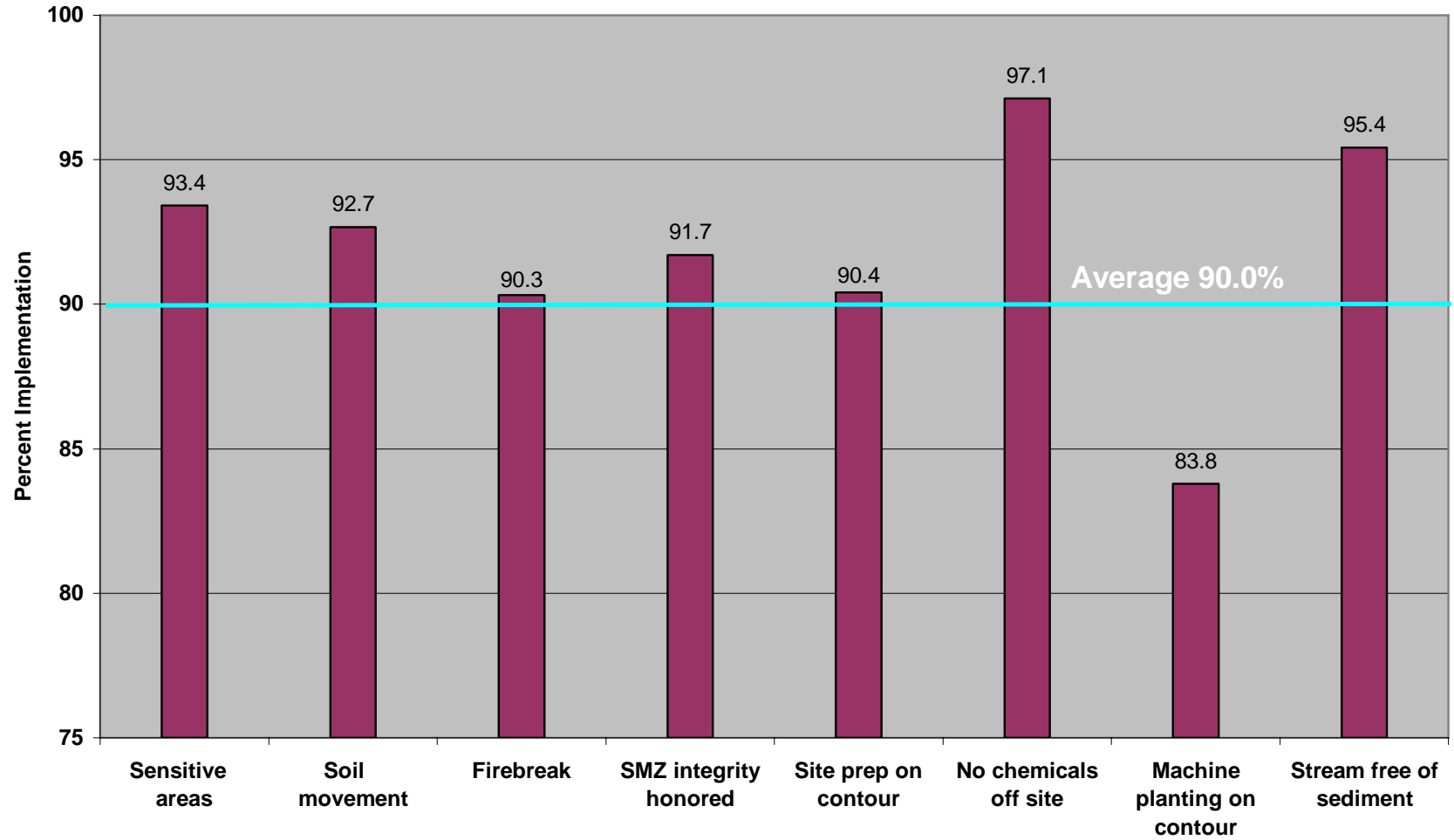
BMP	Yes	No	N/A	% Implementation	Water quality Risks	Margin of Error
Respect sensitive areas	142	10	303	93.4	0	4.0
No soil movement on site	253	20	631	92.7	1	3.1
Firebreak erosion controlled	140	15	748	90.3	0	4.8
SMZ integrity honored	177	16	711	91.7	0	4.0
Windrows on contour/free of soil	66	7	831	90.4	0	6.9
No chemicals off site	101	3	800	97.1	0	3.3
Machine planting on contour	31	6	417	83.8	0	12.1
Stream free of sediment	188	9	707	95.4	0	3.0
Were BMPs used*	52	42	354	55.3	0	10.3
<b>Total</b>	<b>1098</b>	<b>86</b>	<b>5148</b>	<b>90.0</b>	<b>1</b>	

\* Question removed from checklist in 2000.

**Figure 13. Overall BMP Implementation on Site Preparation (1992 - 2005)**



**Figure 14. Overall BMP Implementation by Question (1992-2005)  
Site Preparation**



## LANDINGS

Landings, sometimes called sets, are areas where logs are gathered, delimbed, bucked, and loaded onto trucks. Landings were evaluated on 731 sites with an overall implementation of 96.8%, the highest score of any category. Historically, landings have consistently rated at or near the top, and show a slight improvement over time (6%), with scores ranging from 93.6% – 98.8%. See Table 7, Figure 15, and Figure 16.

Table 7. Implementation of BMPs Relating to Landings.

BMP	Yes	No	N/A	% Implementation	Water quality Risks	Margin of Error
Location free of oil/trash	684	47	173	93.6	0	1.8
Located outside of SMZ	601	7	296	98.8	0	0.9
Well drained location	704	12	188	98.3	0	1.0
Number and size minimized	348	1	106	99.7	0	0.6
Respect sensitive areas	348	1	106	99.7	0	0.6
Restored/stabilized	327	33	544	90.8	0	3.0
<b>Total</b>	<b>3012</b>	<b>101</b>	<b>1413</b>	<b>96.8</b>	<b>0</b>	

**Figure 15. Overall BMP Implementation on Landings (1992 - 2005)**

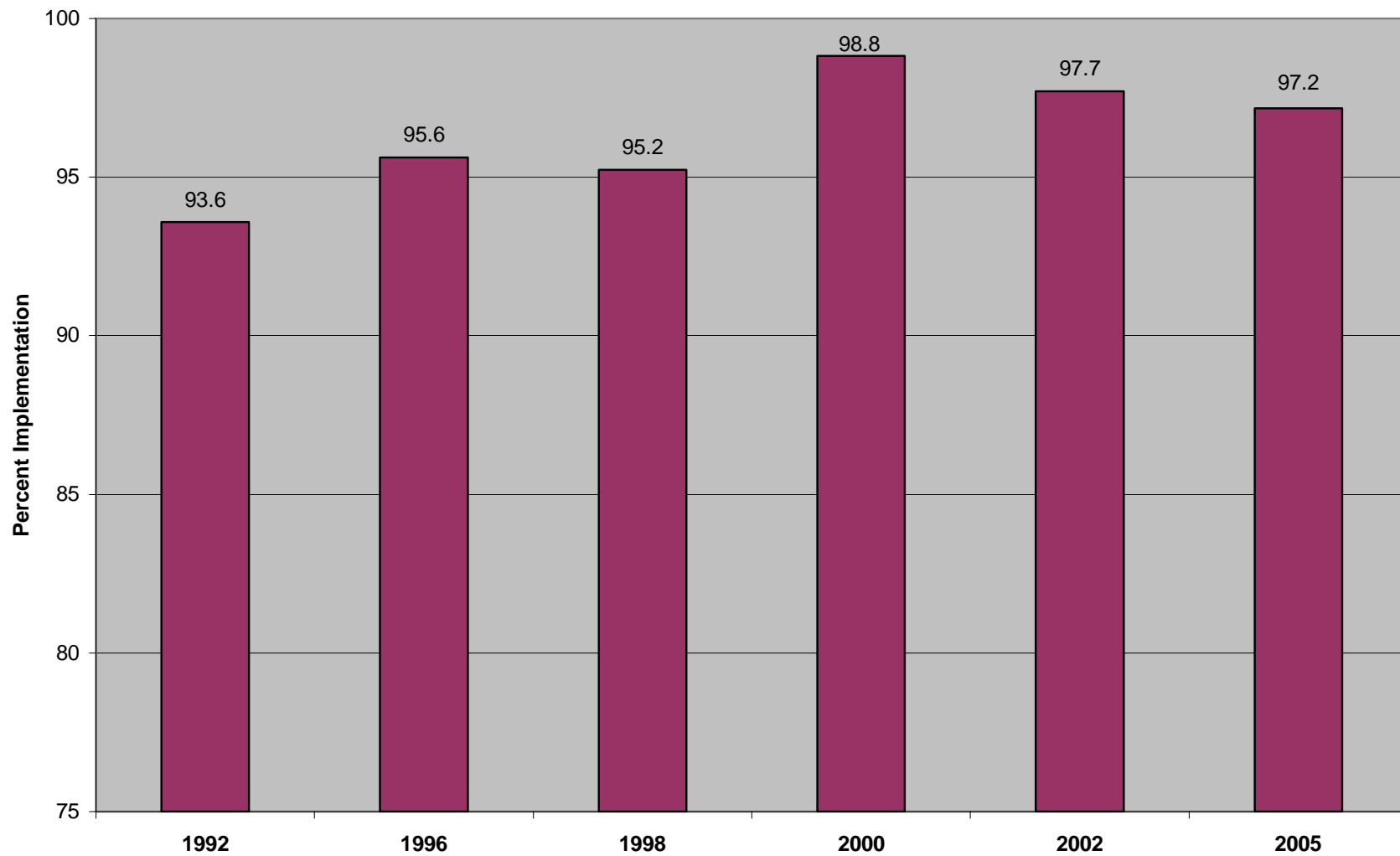
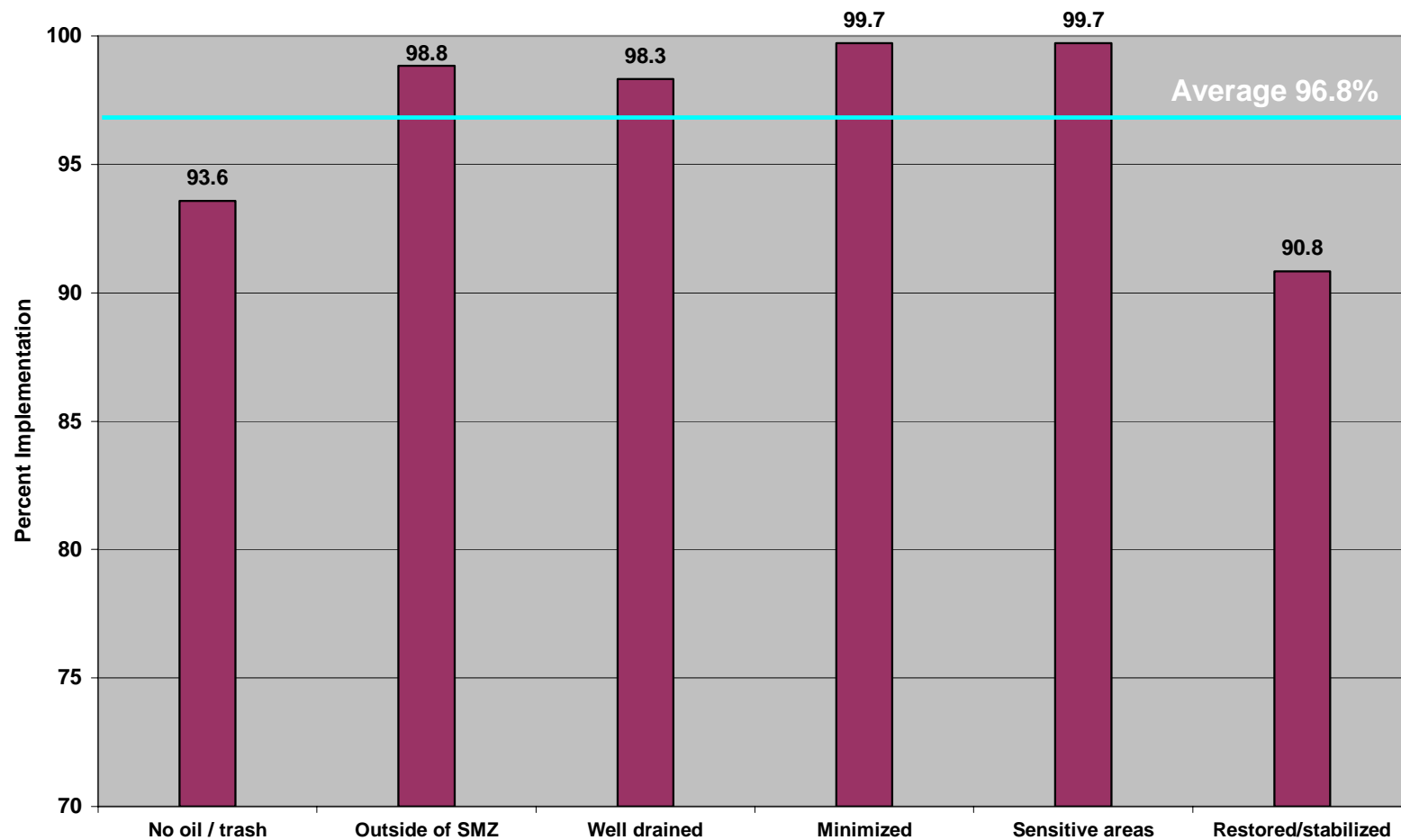


Figure 16. Overall BMP Implementation by Question (1992-2005)  
Landings



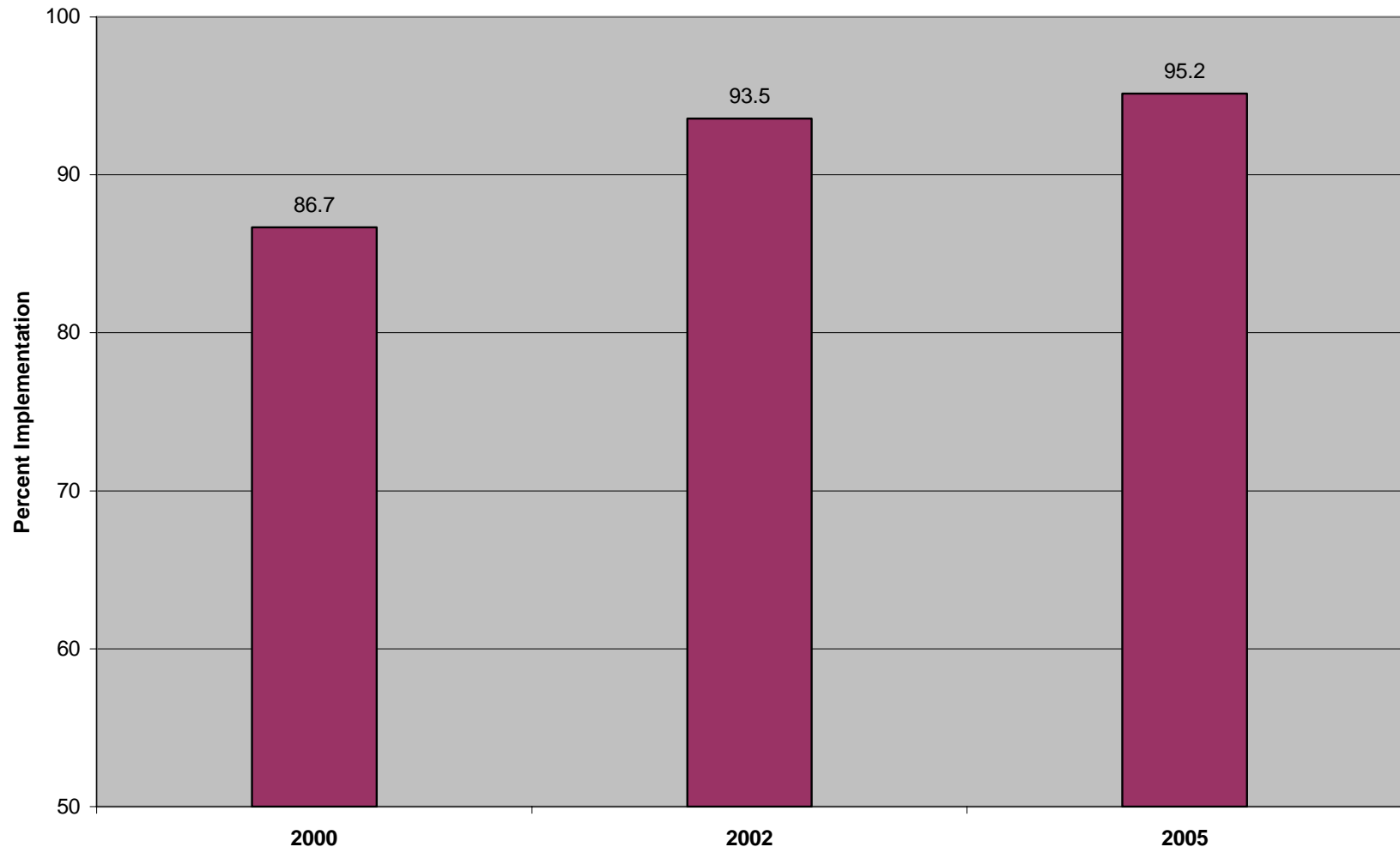
## WETLANDS

Seventy-one sites had wetland or “wetland like” areas (not necessarily jurisdictional) since 2000, the year this category was added. These sites had an overall implementation of 92.9%. Historically, this category has shown improvement in BMP implementation (10%), with scores ranging from 86.7% – 95.2%, and is considered a strong point in our monitoring program. It is important to note that all mandatory road BMPs for wetlands were followed. See Table 8, Figure 17, and Figure 18.

Table 8. Implementation of BMPs Relating to Wetlands.

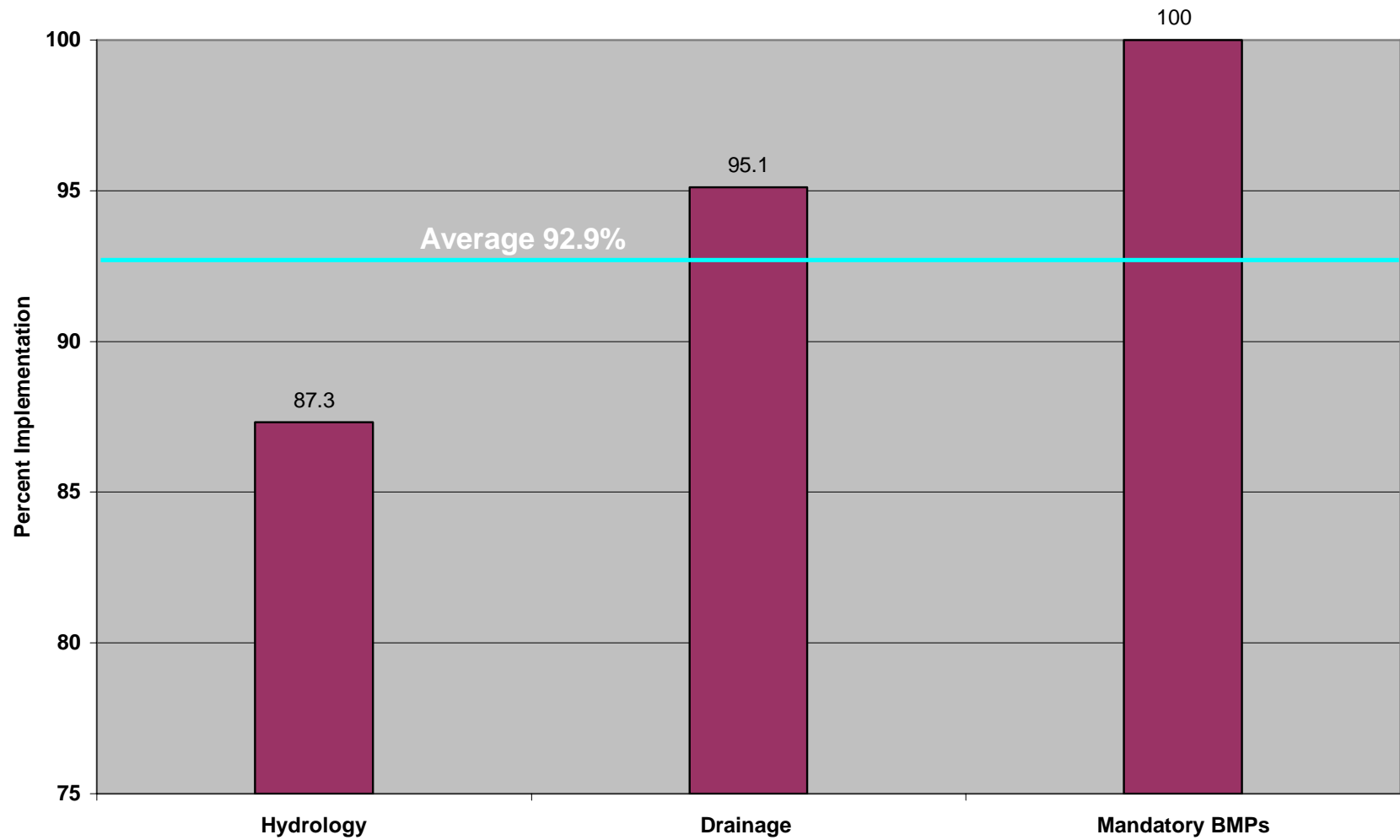
BMP	Yes	No	N/A	% Implementation	Water quality Risks	Margin of Error
Avoid altering hydrology of site	62	9	385	87.3	0	7.9
Road drainage structures installed properly	39	2	415	95.1	0	6.7
Mandatory road BMPs followed	42	0	414	100	0	-
<b>Total</b>	<b>143</b>	<b>11</b>	<b>1214</b>	<b>92.9</b>	<b>0</b>	

**Figure 17. Overall BMP Implementation in Wetlands (2000 - 2005)**





**Figure 18. Overall Compliance by Question (2000-2005)  
Wetlands**



## OVERALL BMP IMPLEMENTATION

Significant progress has been made in BMP implementation over the past 15 years (+21%). Figure 19 documents the tremendous improvement in temporary roads, stream crossings, SMZs, and site preparation. Gains were even reported for landings, permanent roads, and wetlands, categories that consistently rank high in implementation.

To illustrate the spread of the implementation scores, the results were separated into five categories: 0-50%, 51-70%, 71-80%, 81-90%, and 91-100%. Figure 20 geographically illustrates the scores across all ownerships while Figure 21 shows the number of tracts by ownership receiving the respective level of implementation.

### IMPLEMENTATION BY SITE CHARACTERISTICS

#### Ownership

The public ownership category fared best, with 95.8% for the 60 tracts with no water quality risks noted.

The 21 sites owned by TIMO landowners had an overall BMP implementation of 95.3% and had only one water quality risk.

Forest industry owned 349 of the sites and had an overall implementation of 92.3% with only ten water quality risks.

Family forest owners had an implementation rating of 79.1% with 47 water quality risks on 474 sites. Though this represents the lowest level of the four ownership types, this group has made tremendous progress over the years, increasing overall BMP implementation by 29% to its current level of 88.6%. Even greater strides were made on temporary roads (+68%), site preparation (+59%), stream crossings (+58%), wetlands (+45%), and SMZs (+42%). See Figure 22 and 23.

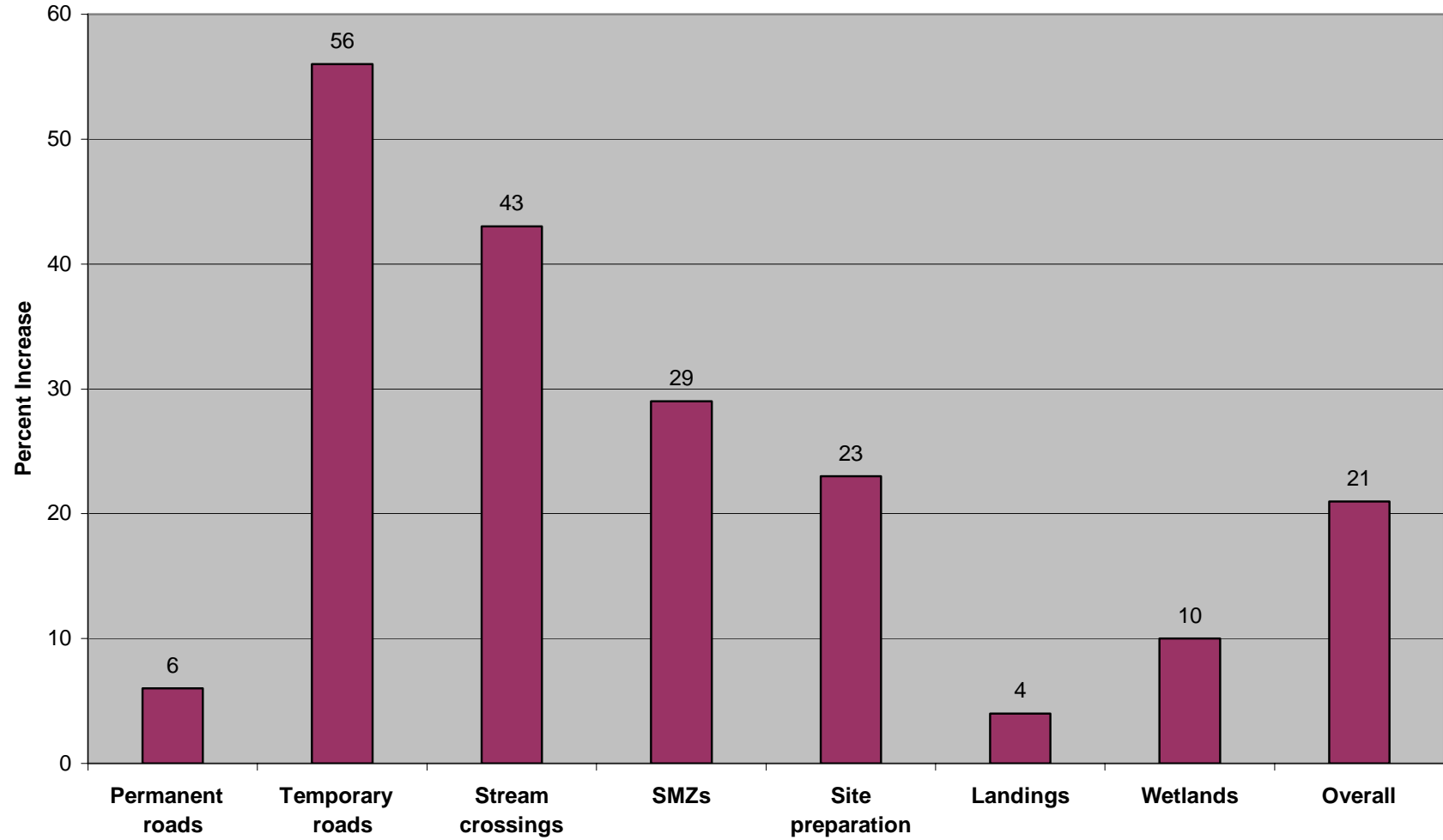
#### Type of Activity

Four types of silvicultural activities were monitored: regeneration harvests, partial regeneration cuts, thinning, and site preparation. See Table 9.

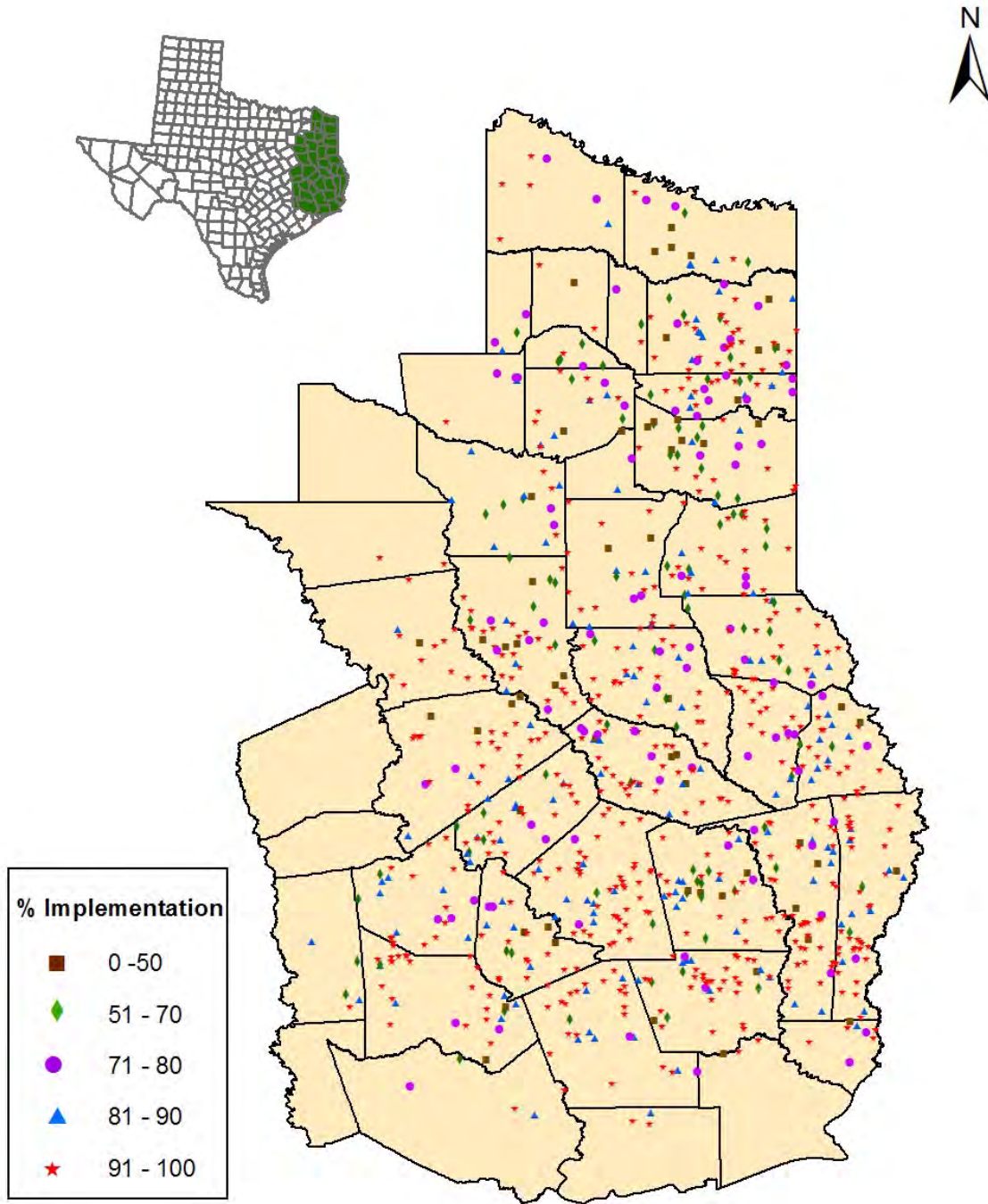
Table 9. Overall BMP Implementation by Type of Operation.

Type of Operation	Percent Implementation
Regeneration harvest (clearcut)	82.9%
Regeneration harvest (partial cut)	83.2%
Thinning	92.2%
Site preparation (only)	90.5%

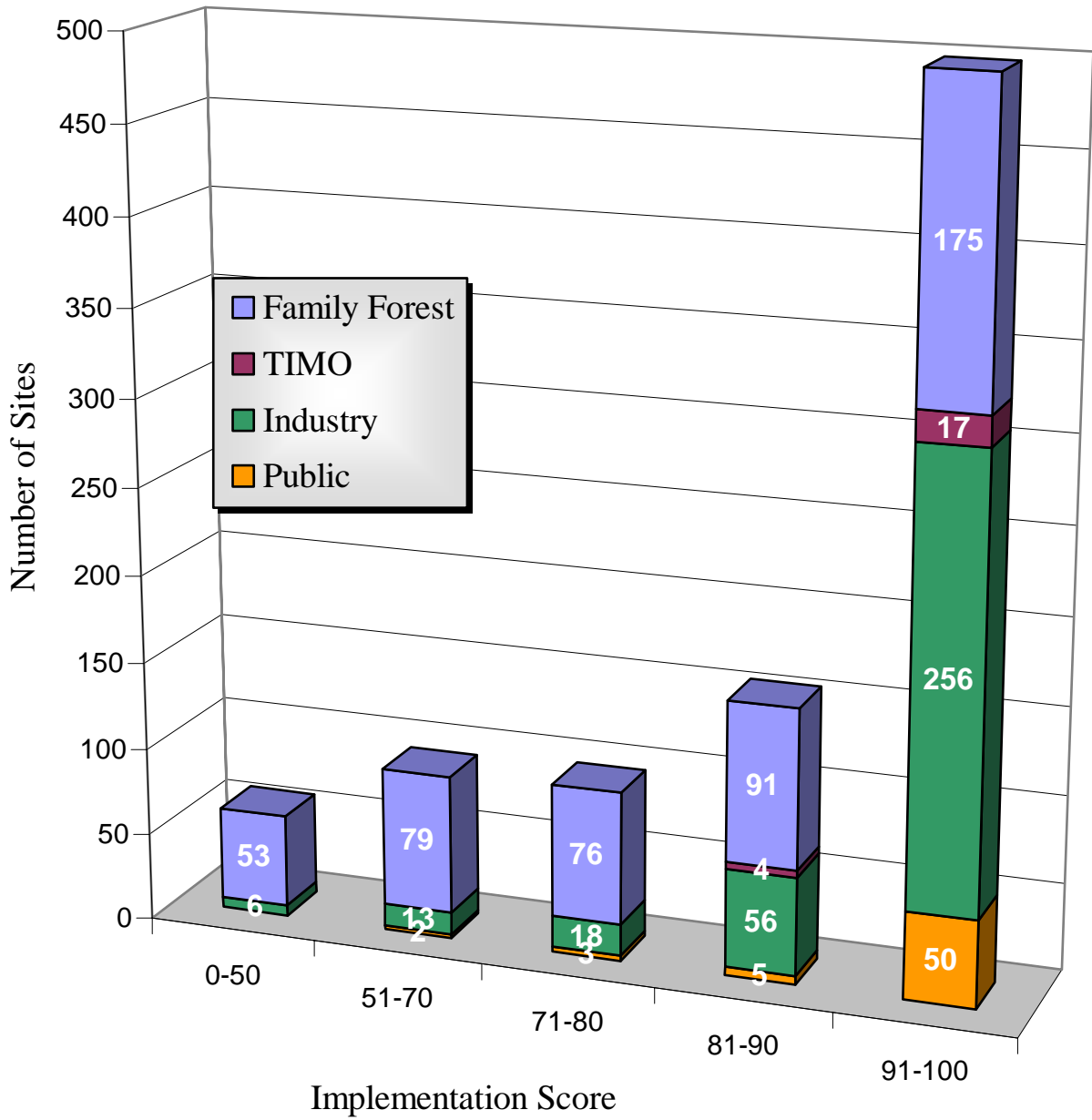
**Figure 19. Percent Increase in BMP Implementation by Category  
(1992 - 2005)**



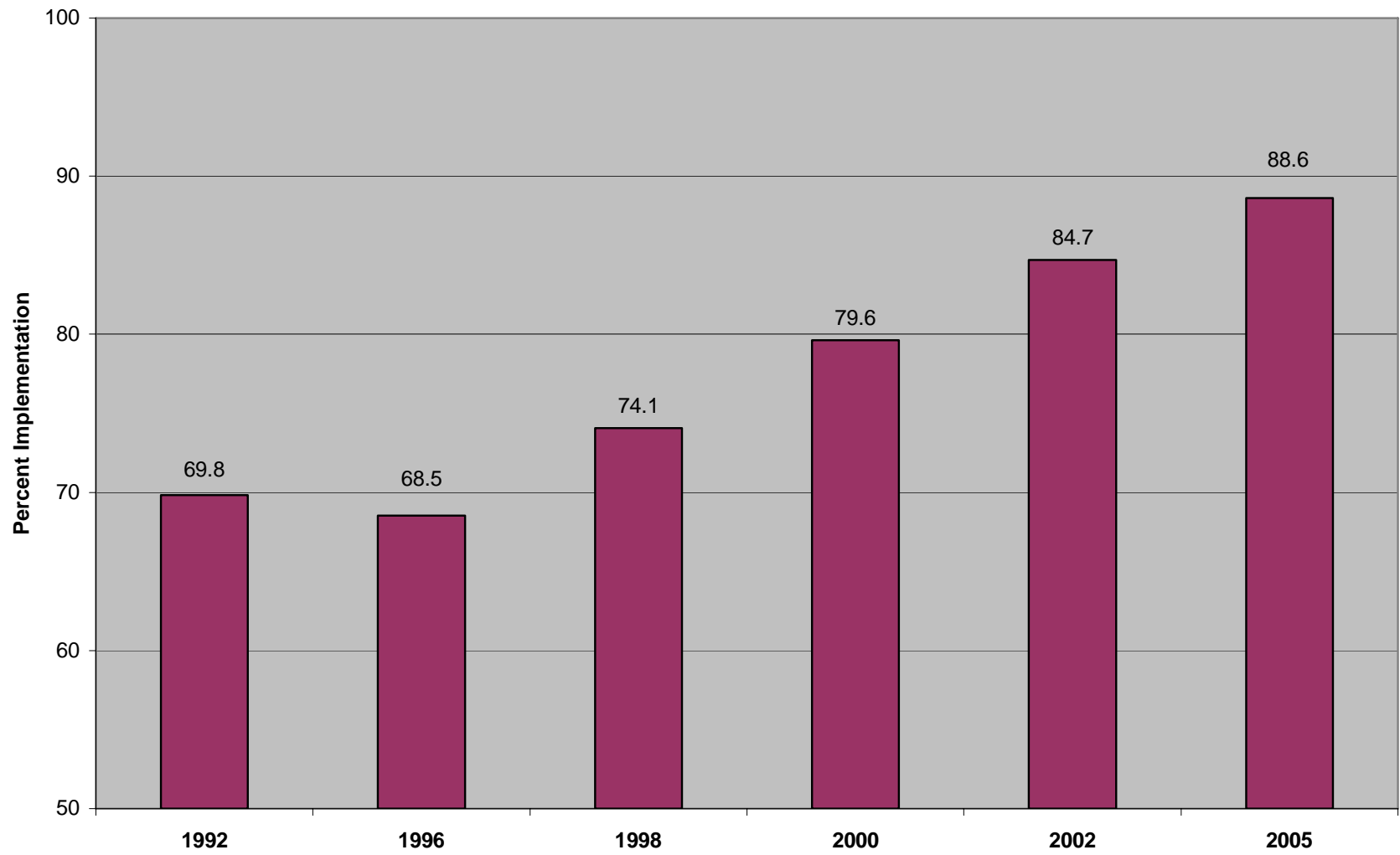
**Figure 20. Site Locations by BMP Implementation Scores.**



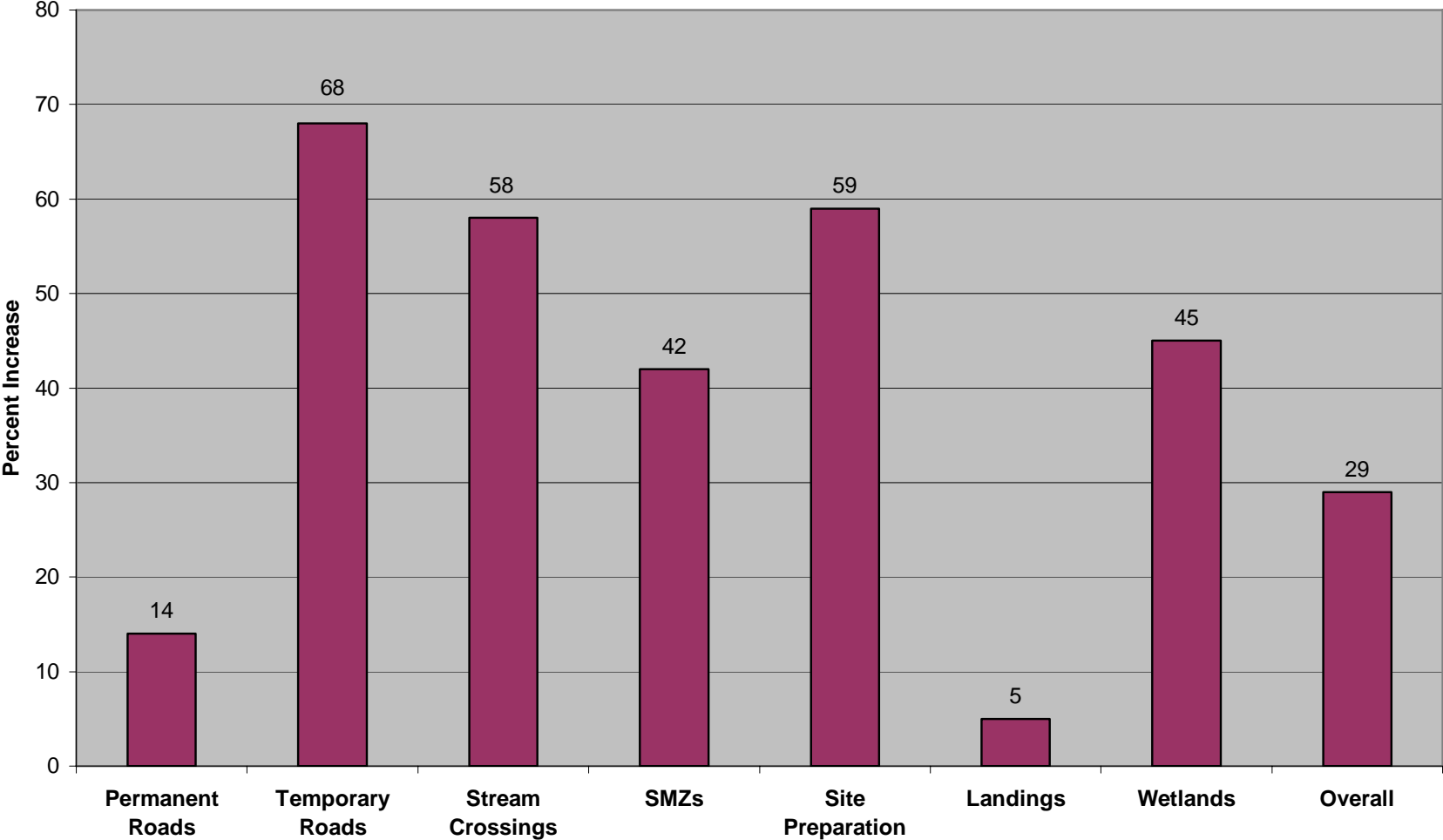
**Figure 21. Overall Implementation Scores by Number of Sites and Ownership.**



**Figure 22. Overall BMP Implementation by Family Forest Owners (1992-2005)**



**Figure 23. Percent Increase in Family Forest Owner BMP Implementation Categories (1992 - 2005)**



## CONCLUSION

Major improvements in BMP implementation have been noted in Texas over the past 15 years. Overall BMP implementation rates have increased by 21% since the program began and are now at an all time high (91.7%). Even greater strides have been made in traditional “problem areas” – temporary roads (+56%), stream crossings (+43%), and SMZs (+29%).

Family forest owners are starting to embrace these practices as well and have led the advancement. Tremendous gains have been made on private land, most notably on temporary roads (+68%), site preparation (+59%), stream crossings (+58%), wetlands (+45%), and SMZs (+42%). This dramatic improvement demonstrates the effectiveness of the Texas Forest Service BMP Program in promoting BMP implementation as well as the forestry community’s commitment to environmental stewardship.

Forest industry has also played a significant role in encouraging BMP implementation, increasing rates on their own land by 10% to their current level of 96%. This is due primarily because of its support of the Texas Forest Service BMP Program and participation in the Sustainable Forestry Initiative<sup>®</sup>. Water quality protection is obviously a top priority, as evident by requiring all contractors to attend BMP training workshops, including BMPs in their timber sale contracts, and supporting educational workshops.

Although BMP implementation has increased, there is still room for improvement. This analysis identified several deficiencies in BMP implementation – temporary stream crossings, roads, and SMZs. Focusing educational efforts on correctly installing and restoring temporary stream crossings as well as ensuring that temporary roads are well drained and stabilized appear to be the best way to improve BMP implementation in the future. An all day course concentrating on how to properly install and remediate stream crossings is scheduled for March 2007 that will fit into the Texas Forestry Association’s Pro Logger continuing education program. Future courses will include specific focus on BMPs related to forest roads and SMZs. Combining this BMP specific training with effective educational programs and technical assistance to family forest owners should greatly reduce any potential water quality impacts from silvicultural operations.



## **Appendix**

Implementation Monitoring Checklist (Old)

Implementation Monitoring Checklist (New)

Checklist Comparison

**TEXAS BMP MONITORING CHECKLIST**

**GENERAL**

- 1. County \_\_\_\_\_ 2. Block/Grid \_\_\_\_\_
- 3. Latitude \_\_\_\_\_ Longitude \_\_\_\_\_
- Forester: 4. \_\_\_\_\_ 5. \_\_\_\_\_
- 6. Timber Buyer \_\_\_\_\_
- 7. Logger \_\_\_\_\_
- 8. Activity \_\_\_\_\_
- 9. Estimated date of activity \_\_\_\_\_
- 10. Acres affected \_\_\_\_\_
- 11. Inspector \_\_\_\_\_

**LANDOWNER:**

- 12. Owner Type: N L A I P
- 13. Name \_\_\_\_\_
- 14. Address \_\_\_\_\_
- 15. City \_\_\_\_\_ ZIP \_\_\_\_\_
- 16. Phone \_\_\_\_\_
- 17. Date of Inspection \_\_\_\_\_
- 18. Accompanied by: \_\_\_\_\_

**SITE CHARACTERISTICS**

- 19. Terrain: F H S
- 20. Erodability hazard: L M H
- 21. Type stream present P I
- 22. Distance to nearest permanent water body:  
 <300' 300-800' 800-1600' 1600'+
- 23. Predominant soil series/texture: \_\_\_\_\_ / C CL L SL S

**PERMANENT ROADS**

[ ] NOT APPLICABLE

- 24. Avoid sensitive areas. Y N NA
- 25. Roads meet grade specs. Y N NA
- 26. Stabilized stream crossing. Y N NA
- 27. Rutting within allowable specs. Y N NA
- 28. Ditches do not dump into streams. Y N NA
- 29. Were BMP's used. Y N NA  
 Type: RD WD WB RE OC PL RS CU BR LW
- 30. Were BMP's effective. Y N NA
- 31. Stream free of sediment. Y N NA

**SKID TRAILS / TEMPORARY ROADS**

[ ] NOT APPLICABLE

- 32. Slopes less than 15%. Y N NA
- 33. Rutting within allowable specs. Y N NA
- 34. Water bars evident. Y N NA
- 35. Water bars working. Y N NA
- 36. Stream crossings minimized. Y N NA
- 37. Stream crossings correct. Y N NA
- 38. Stream crossings restored & stabilized. Y N NA
- 39. Were BMP's used. Y N NA  
 Type: RD WD WB RE OC PL RS CU BR LW
- 40. Stream free of sediment. Y N NA

**SMZ**

[ ] NOT APPLICABLE

- 41. SMZ present on permanent stream. Y N NA
- 42. SMZ present on intermittent stream. Y N NA
- 43. SMZ adequately wide. Y N NA
- 44. Thinning within allowable specs. Y N NA
- 45. SMZ integrity honored. Y N NA
- 46. Stream clear of debris. Y N NA
- 47. SMZ free of roads and landings. Y N NA
- 48. Stream free of sediment. Y N NA

**SITE PREPARATION**

[ ] NOT APPLICABLE

- 49. Site prep method \_\_\_\_\_
- 50. Regeneration method \_\_\_\_\_
- 51. No soil movement on site. Y N NA
- 52. Firebreak erosion controlled. Y N NA
- 53. SMZ integrity honored. Y N NA
- 54. Windrows on contour / free of soil. Y N NA
- 55. No chemicals off site. Y N NA
- 56. Were BMP's used. Y N NA  
 Type: WB RE OC RS
- 57. Stream free of sediment. Y N NA

**LANDINGS**

[ ] NOT APPLICABLE

- 58. Locations free of oil / trash. Y N NA
- 59. Located outside SMZ. Y N NA
- 60. Well drained location Y N NA
- 61. Restored, stabilized. Y N NA

**62. Overall compliance with Best Management Practices**

**NEEDS IMPROVEMENT**  
 NO EFFORT POOR

**PASS**  
 FAIR GOOD EXCELLENT



Site ID

### I. General Landowner and Tract Information

County  TFS Block and Grid  Region

Latitude  Longitude

Forester Type  Name

Timber Buyer  Logging Contractor

Activity  Acres Affected

Estimated Date of Activity  Date of Inspection

Inspector  Accompanied by

Owner Type:

N  A  C  I  P

Landowner:

Name

Address

City  State

Zip

Phone

### II. Site Characteristics

Terrain:  Flat  Hilly  Steep

Erodibility hazard:  Low  Medium  High

Type stream present:  Perennial  Intermittent

Watershed Code

River Basin

Distance to nearest permanent water body:

< 300'  300 - 800'  800 - 1600'  1600' +

Predominant soil series/texture:

Clay  Clay Loam  Loam  Sandy Loam  Sand

### III. Permanent Roads

1. Respect sensitive areas, such as SMZs, steep slopes, and wet areas
2. Meet grade specifications by having slopes between two and ten percent
3. Rutting within allowable specs of less than six inches deep for not more than fifty feet
4. Well drained with appropriate structures to minimize soil movement
5. Wing ditches, waterbars, and water turnouts do not dump into streams
6. Reshaped and/or stabilized to minimize soil movement

BMPs present  RD  WD  WB  RE  OC  
 PL  RS  CU  SD  BD

Section Total

Percent Implementation

YES	NO	NA/NN	Sig. Risk
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### IV. Skid Trails/Temporary (secondary) Roads

1. Respect sensitive areas, such as SMZs, steep slopes, and wet areas
2. Slopes less than 15% and laid out on the contour of the land
3. Rutting within allowable specs of less than six inches deep for not more than fifty feet
4. Well drained with appropriate structures to minimize soil movement
5. Stabilized to minimize soil movement

BMPs present  WD  WB  RE  OC  
 PL  RS  LS

Section Total

Percent Implementation

YES	NO	NA/NN	Sig. Risk
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**V. Stream Crossings**

On Permanent Roads

- 1. Stabilized stream banks, crossings at right angles, and no evidence of washouts
- 2. Wing ditches, waterbars, and water turnouts do not dump into streams
- 3. Stream free of sediment
- 4. Number of crossings minimized

On Temporary Roads

- 5. Number of crossings minimized
- 6. Stream crossings correct to minimize potential erosion in the stream chann
- 7. Approaches at right angles to minimize bank disturbance
- 8. Stream crossings restored and stabilized by removing temporary crossing
- 9. Stream free of sediment

BMPs Present  CU  BR  LW

YES NO NA/NN Sig. Risk

YES	NO	NA/NN	Sig. Risk
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section Total

Percent Implementation

**VI. Streamside Management Zones**

- 1. Present on permanent stream
- 2. Present on intermittent stream
- 3. SMZ adequately wide by leaving fifty feet on both sides of the stream
- 4. Thinning within allowable specs by leaving 50 square feet of BA
- 5. SMZ integrity honored by keeping skidders, roads, landings, and firebreaks out
- 6. Stream clear of debris, such as tops, limbs, and debris
- 7. SMZ free of roads and landings
- 8. Stream free of sediment

YES NO NA/NN Sig. Risk

YES	NO	NA/NN	Sig. Risk
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section Total

Percent Implementation

**VII. Site Preparation**

Site preparation method

Regeneration method

- 1. Respect sensitive areas by preventing site prep intrusion
- 2. No soil movement on site, especially broad scale sheet erosio
- 3. Firebreak erosion controlled to prevent potential erosion
- 4. SMZ integrity honored by preventing site prep intrusion
- 5. Windrows on contour / free of soil to minimize soil disturbance
- 6. No chemicals off site or entering water bodies
- 7. Machine planting on contour rather than up and down steep slopes
- 8. Stream free of sediment

YES NO NA/NN Sig. Risk

YES	NO	NA/NN	Sig. Risk
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section Total

Percent Implementation

**VIII. Landings**

- 1. Locations free of oil / trash and properly disposed of
- 2. Located outside of SMZ to minimize traffic and erosion in the SMZ
- 3. Well drained location to minimize puddling, soil degradation, and soil moveme
- 4. Number and size minimized
- 5. Respect sensitive areas, including SMZs, steep slopes, and wet areas
- 6. Restored / stabilized by back blading, spreading bark, or seeding to minimize erosio

YES NO NA/NN Sig. Risk

YES	NO	NA/NN	Sig. Risk
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section Total

Percent Implementation

**IX. Wetlands (may or may not be jurisdictional)**

- 1. Avoid altering hydrology of site by minimizing ruts and soil compactio
- 2. Road drainage structures installed properly to maintain flow of water
- 3. Mandatory road BMPs followed

YES	NO	NA/NN	Sig. Risk
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section Total

Percent Implementation

**X. Overall Compliance**

- III. Permanent Roads
- IV. Skid trails/Temporary Roads
- V. Stream Crossings
- VI. Streamside Management Zones
- VII. Site Preparation
- VIII. Landings
- IX. Wetlands

YES	NO	NA/NN	Sig. Risk
<input type="text" value="0"/>	<input type="text" value="0"/>	<input checked="" type="checkbox"/>	<input type="text" value="0"/>
<input type="text" value="0"/>	<input type="text" value="0"/>	<input checked="" type="checkbox"/>	<input type="text" value="0"/>
<input type="text" value="0"/>	<input type="text" value="0"/>	<input checked="" type="checkbox"/>	<input type="text" value="0"/>
<input type="text" value="0"/>	<input type="text" value="0"/>	<input checked="" type="checkbox"/>	<input type="text" value="0"/>
<input type="text" value="0"/>	<input type="text" value="0"/>	<input checked="" type="checkbox"/>	<input type="text" value="0"/>
<input type="text" value="0"/>	<input type="text" value="0"/>	<input checked="" type="checkbox"/>	<input type="text" value="0"/>
<input type="text" value="0"/>	<input type="text" value="0"/>	<input checked="" type="checkbox"/>	<input type="text" value="0"/>

Overall Total

Total Significant Risk

Percent Implementation

Needs Improvement	Pass
<input type="checkbox"/> No Effort <input type="checkbox"/> Poor	<input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Excellent

Follow Up Questions

YES NO NA/NN

Was activity supervised by landowner or representative?  
Who?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

Was landowner familiar with BMPs?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

Has logger attended BMP Workshop?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

Were BMPs included in the contract?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

Is landowner a member of TFA? Landowner Association? Other?  
Organization

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

Is remediation planned by landowner (if needed)?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Date <input type="text"/>
--------------------------	--------------------------	--------------------------	---------------------------

Comments (Explain observed actions in the field check. Make recommendations.)

Map/Sketch Area (on back if needed)

Comparison of BMP Monitoring Checklist Forms

Old Form	New Form
Site ID	Site ID
1. County	County
2. Block/Grid	TFS Block/Grid
	<i>*Region</i>
3. Latitude	Latitude
Longitude	Longitude
4. Forester	Forester Type
5. Name	Name
6. Timber Buyer	Timber Buyer
7. Logger	Logging Contractor
8. Activity	Activity
9. Estimated date of activity	Estimated date of activity
10. Acres affected	Acres affected
11. Inspector	Inspector
12. Landowner Type	Owner Type
13-16. Landowner contact information	Landowner contact information
	<i>*Landowner e-mail</i>
17. Date of inspection	Date of inspection
18. Accompanied by	Accompanied by
19. Terrain	Terrain
20. Erodability hazard	Erodability hazard
21. Type stream present	Type stream present
	<i>*River Basin</i>
22. Distance to nearest permanent water	Distance to nearest permanent water body
	<i>*Watershed code</i>
23. Predominant soil series/texture	Predominant soil series/texture
<b>Permanent Roads</b>	
24. Avoid sensitive areas	III.1. Respect sensitive areas
25. Roads meet grade specs	III.2. Meet grade specifications
26. Stabilized stream crossing	See Question V.1
27. Rutting w/in allowable specs	III.3. Rutting w/in allowable specs
28. Ditches do not dump into streams	III.5. Wing ditches do not dump
**29. Were BMP's used?	III.4. Well drained w/appropriate structures
Type	BMP's present (check boxes)
<b>**30. Were BMP's effective</b>	
	<i>*III.6. Reshaped and/or stabilized</i>
31. Stream free of sediment	See Question V.3
<b>Temporary Roads / Skid Trails</b>	
32. Slopes less than 15%	IV.1. Slopes less than 15%
	IV.2. Respect sensitive areas
33. Rutting within allowable specs	IV.5. Rutting within allowable specs
<b>**34. Water bars evident</b>	

**35. Water bars working	
36. Stream crossings minimized	See Question V.5
37. Stream crossings correct	See Question V.6
38. Stream crossings restored & stabilized	See Question V.8
39. Were BMPs Used?	IV.4. Well drained w/appropriate structures
Type	BMP's present (check boxes)
40. Stream free of sediment	See Question V.9
	*IV.5. Stabilized to minimize soil movement
<b>Stream Crossings</b>	
See Question 26	V.1 Stabilized
	*V.2 Ditches
See Question 31	V.3 Stream free of sediment
	*V.4 Crossings minimized – Permanent
See Question 36	V.5 Crossings minimized – Temporary
See Question 37	V.6 Correct
	*V.7 Approaches at right angles
See Question 38	V.8 Restored and stabilized
See Question 40	V.9 Free of sediment
<b>SMZs</b>	
41. SMZ present on permanent stream	VI.1. Present on permanent stream
42. SMZ present on intermittent stream	VI.2. Present on intermittent stream
43. SMZ adequately wide	VI.3. SMZ adequately wide
44. Thinning within allowable specs	VI.4. Thinning within allowable specs
45. SMZ integrity honored	VI.5. SMZ integrity honored
46. Stream clear of debris	VI.6. Stream clear of debris
47. SMZ free of roads & landings	VI.7. SMZ free of roads & landings
48. Stream free of sediment	VI.8. Stream free of sediment
<b>Site Preparation</b>	
49. Site prep method	VII. Site preparation method
50. Regeneration method	VII. Regeneration method
	*VII.1. Respect sensitive areas
51. No soil movement	VII.2. No soil movement
52. Firebreak erosion controlled	VII.3. Firebreak erosion controlled
53. SMZ integrity honored	VII.4. SMZ integrity honored
54. Windrows on contour/free of soil	VII.5. Windrows on contour/free of soil
55. No chemicals off site	VII.6. No chemicals off site
**56. Were BMP's used/Type	
	*VII.7. Machine planting on contour
57. Stream free of sediment	VII.8. Stream free of sediment
<b>Landings</b>	
58. Locations free of oil/trash	VIII.1. Landings free of oil/trash
59. Located outside SMZ	VIII.2. Located outside SMZ
60. Well drained location	VIII.3. Well drained location
	*VIII.4. Number & size minimized



	*VIII.5. Respect sensitive areas
61. Restored, stabilized	VIII.6. Restored/stabilized
<b>Wetlands</b>	
	*IX.1 Hydrology
	*IX.2 Road drainage
	*IX.3 Mandatory BMPs
<b>Overall Compliance</b>	
	*X. Overall percent implementation
62. Overall compliance w/BMP's	Subjective Score
<b>Follow Up Questions</b>	
Was activity supervised by landowner or representative?	Was activity supervised? Name
Was landowner familiar with BMP's?	Was landowner familiar with BMP's?
Was logger familiar with BMP handbook?	Has logger attended BMP workshop?
Were BMP's included in the contract?	Were BMP's included in the contract?
Is landowner a member of TFA/LO Assoc. /For. Farmer?	Is landowner a member of TFA? LO Assoc. /Other?
Is remediation planned by landowner if needed?	Is remediation planned by landowner
Comments	Comments
Map/Sketch area	Map/Sketch area (on back if needed)

\* Questions added to the new form

\*\* Questions removed from the old form