



Roads, Parking Lots, Bridges and Trails Conditions and Future Needs



U. S. Fish and Wildlife Service
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Executive Summary

The U.S. Fish and Wildlife Service (Service) is responsible for conserving, protecting, and enhancing fish and wildlife and their habitats for the continuing benefit of the American people through programs relating to migratory birds, endangered species, interjurisdictional fish and marine mammals, and inland sport fisheries.

The Service manages and maintains over 4,800 miles (paved and unpaved) of public roads, almost 5,000 parking lots, over 200 public use bridges over 20 feet in length (over 300 more than 10 feet in length), and over 680 miles of foot trails and boardwalks.

Refuge Roads funding provided by the Transportation Equity Act for the 21st Century (TEA-21) is being used to make improvements to the public roads, parking lots and bridges managed by the Service. The first nationwide inventory and condition assessment of Service managed roads and parking lots has been completed by the Federal Highway Administration (FHWA).

Significant improvements to existing roads and parking lots are needed to accommodate the 50% increase in public recreational visits that is expected by 2009, when visitation is expected to increase to over 61 million people per year

The condition assessment and other studies determined:

- 77% of the roads, 76% of the parking lots, 55% of the bridges and 67% of the trails are in fair to poor condition;
- that an estimated \$1.9 billion is needed to maintain and improve existing roads and parking lots;
- \$29 million of bridge improvements and \$32 million of recreational trail improvements are needed; and
- \$59 million of funding is needed for alternative transportation systems

A 50% increase in public recreational visits is expected by 2009.

By 2009, the value of refuge visitation to regional economies is expected to reach \$1.054 billion per year.

\$56 million a year is needed to maintain and improve existing roads and parking lots

\$7 million a year is needed to maintain and improve existing bridges and trails

\$5.9 million a year is needed to improve transit systems

Introduction

The Service manages over 570 national wildlife refuges and wetland management districts, 70 national fish hatcheries and 42 administrative sites. More than 95 million acres are managed by the Service in the 50 States, Puerto Rico, Virgin Islands, American Samoa, Guam and the insular possessions of the United States.¹

Since the 1870's, the Federal government has developed transportation systems for administrative purposes and for use by the public to visit Service areas. Over 4,800 miles (paved and unpaved) of public roads, almost 5,000 parking lots, over 200 public use bridges over 20 feet in length (over 300 over 10 feet in length), over 680 miles of foot trails and boardwalks, and over 5,400 miles of roads for administrative use are managed by the Service.² Appendix 1 shows the distribution of Service facilities by State.



Fish Cars were used by the U.S. Fish Commission to transport fish from fish hatcheries to lakes and rivers for stocking from 1872 to 1947.

Service facilities were among the first federally managed areas to be established for resource management purposes in the United States. The first federally established reservation for wildlife management was established for fur seals on Saint Paul and Saint George Islands in Alaska by Congress in 1869.³ The first federal fish hatchery was established on the McCloud River in California in 1872. The first federally established bird reservation was created at Pelican Island, Florida, in 1903 by Executive Order of President Theodore Roosevelt.⁴

The Service manages over 95 million acres in the 50 States, American Samoa, Guam, Puerto Rico, Virgin Islands and insular possessions

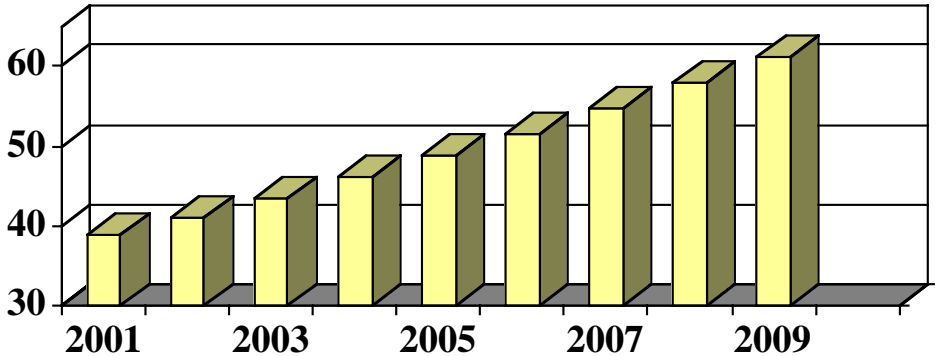
The Service maintains over 4,800 miles of public roads, almost 5,000 parking lots, over 300 bridges, and over 680 miles of foot trails and boardwalks

Public Use

More than 38.8 million visitors came to Service managed refuges, hatcheries and administrative areas in 2001. Visitation is expected to increase to over 61.2 million by 2009.⁵ Generally, most of the visitors arrive using ground transportation in the form of private vehicles that allow them to travel to and within Service areas for recreational opportunities.

Appendix 2 shows the distribution of refuge visitation at Service facilities by State.

Projected Growth in Public Use
(millions of visitors)



Over 61 million people a year are expected to visit Service managed lands by 2009

31 percent of the adult population are involved in bird watching and wildlife observation

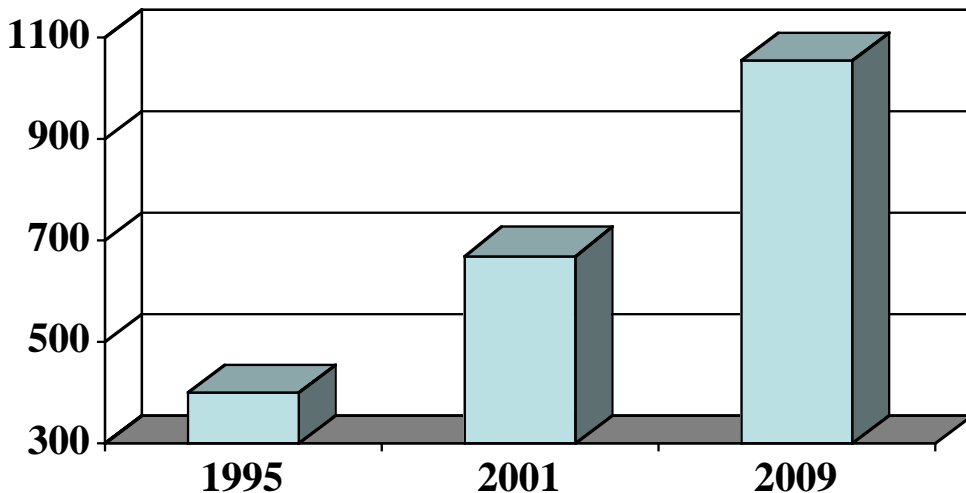


People come to Fish and Wildlife Service areas to participate in a wide range of recreational and educational opportunities.

Economic Importance

In 2001, visitors generated an estimated \$671.2 million of sales in regional economies, resulting in employment of over 14,400 people and \$272.6 million in employment income.⁶ By 2009, the value of regional sales will increase to an estimated value of \$1.054 billion and employment income will have increased to \$428 million.⁷

**Value of Sales in Regional Economies from
Refuge Visitation
(millions of dollars)**



Fishing and wildlife observation are two of the major recreational activities that occur on Service lands.

By 2009 the value of refuge visitation to regional economies will increase to an estimated \$ 1.054 billion per year

Spending related to watching and photographing birds and other wildlife is over \$29 billion a year

Roads

Three types of roads provide access to and within Service lands.

Administrative roads. Service employees and cooperators use these roads to carry out their administrative and management responsibilities. These roads are generally not open to the public. These roads are the sole responsibility of the Federal government.

All maintenance funding for these roads and bridges is provided by funds appropriated annually from the general treasury. These roads, and the associated bridges, are not eligible for funding from the highway trust fund.

Public roads. Visitors use the public roads to access and visit Service facilities and lands. The Service is responsible for the maintenance of federally managed roads and associated bridges.

Maintenance funding for these roads and bridges is provided by funds appropriated to the Department of the Interior from the general treasury and the Refuge Roads Program from the highway trust fund. At some facilities local, county and state assistance is provided to assist the Service in maintaining roads and bridges.



Roadways vary in condition from the good paved road at Seney NWR (MI) to the failed native surface road at Jordan NFH (MI)

Maintenance of administrative roads is funded from annual appropriations to the Department of the Interior

Maintenance of public roads is funded primarily from the Highway Trust Fund

The Service's public road system provides access for visitors by providing connectivity to local, county and state access roads.

The Service currently manages over 4,800 miles of public roads in the 50 states, Puerto Rico, Virgin Islands and Guam. Approximately 8% of the roads are paved. The remaining 92% are gravel or native material.

Over 9.9 million visitors used the Service's auto tour routes during FY 2001. Based upon public use projections for 2009, the use of the auto tour routes is expected to increase to an estimated 15 million visitors.

Condition of Public Roads

Condition	Percent
Good	23%
Fair	40%
Poor	37%

Access roads. Local, county and state governments provide public access from primary and secondary roads to and through Service roads and lands. The local, county and state governments are generally responsible for maintaining these roads and associated bridges.

Maintenance funding is provided by funds appropriated by local, county and state governments. Some funding is also available from the highway trust fund.

The Service helps to maintain some roads in rural areas since the condition of the roads directly affects accessibility to Service managed lands. The Service works with local communities in identifying potential projects for funding from the Public Lands Highway Discretionary program.

The Service's public roads provide access for visitors and connectivity to local, county and state roads

Maintenance of access roads is the responsibility of the local, county and state governments

Public Lands Highway Discretionary funds have helped improve local access routes

The Service manages almost 5,000 parking lots for visitors participating in wildlife related activities

Parking Lots

There are almost 5,000 parking lots on Service lands. Paved parking accounts for 14% of Service parking lots. The remaining 86% of the parking is gravel or native material.

During peak visitation periods many refuges have inadequate parking to accommodate visitors. This causes visitors to pull off along roadway edges impacts to the road shoulders, underlying dikes and adjacent vegetation. Safety problems for visitors and wildlife occur because of inadequate parking.

Condition of Parking Lots

Condition	Percent
Good	24%
Fair	63%
Poor	13%



The parking lots at Kenai NWR (AK), on the left, and Erie NWR (PA), on the right, are examples of poor and failed parking lots that need to be improved.

Bridges

The Service manages over 300 public bridges. These bridges are an integral part of the public use road system that provides access to refuge facilities and on the auto tour routes.

On several refuges, bridges have had to be closed because of bridge failures. These failures have limited public recreational opportunities and lengthened response times for emergency vehicles. Replacement of failed and poor bridges is an essential part of the Refuge Roads program. The Service has been making a concerted effort to improve bridge safety over the last several years.

Condition of Bridges

Condition	Percent
Good	45%
Fair	53%
Poor	2%



The Tyler bridge and water control structure at Moosehorn NWR (ME) had been declared unsafe for public use in 1998 and was replaced in 2000. Trash racks were incorporated into the new design to help eliminate blockages caused by fallen trees.

The Service is responsible for the safety and maintenance of over 300 public bridges

The Service manages over 680 miles of trails, including parts of the national historic trail system

Trails

Over 680 miles of foot trails and boardwalks on refuges and hatcheries provide important recreational opportunities for the public to participate in wildlife observation and environmental education activities. Over 6.7 million visitors use the recreational trails in 2001.

Parts of at least three national historic trails (Lewis and Clark, Mormon, Pony Express) pass through refuges. A lack of resources has limited the Service’s ability to identify, maintain and improve the national scenic trails, national historic trails and recreational trails that are found on Service lands.

Condition of Trails

Condition	Percent
Good	33%
Fair	45%
Poor	22%



The Cross Dike Trail (left) at J.N. “Ding” Darling Refuge (FL) and the Cemeterio Viejo Trail (right) are two of the many trails found on units of the Refuge System.

Transit Systems

The Service manages six transit systems. These transit systems are generally one to two car trams (or equivalent) used to transport visitors on a tour route. These systems can be found at the Patuxent (MD), Chincoteague (VA), Back Bay (VA), J.N. “Ding” Darling (FL), Santa Ana (TX), and National Elk (WY) refuges. Most of the transit systems operate seasonally.

The Service manages six transit systems and two ferry boats



The tram system at the J.N. “Ding” Darling Refuge at Sanibel Island, Florida, is used by over 300,000 visitors yearly.

Public ferry boats are in use at the Kenai NWR (AK) and Presquile NWR (VA). The ferry boats usually work seasonally or on reservation basis.



The ferry boat operated at the Kenai NWR on the Russian River near Soldotna, Alaska, is used by over 30,000 visitors each year.

Facilities Assessment

Road and Parking Lot Inventory and Condition Assessment

The Federal Lands Highway (FLH), Central Federal Lands Division conducted an inventory and condition assessment of all public roads and parking lots on National Wildlife Refuges and National Fish Hatcheries. The inventory and assessment was initiated in the spring of 1999 and final reports are expected in the summer of 2002.

Geo-spatial data was collected on all roads and parking lots for use with geographic information systems. This information will be made available on the Service's internet server for use by other federal agencies, state agencies, local governments and the public. The Service is working with FLH to develop an on-going condition assessment program for roads and parking lots to continue this activity into the future.

Bridge Inventory and Condition Assessment

The Service's Division of Engineering contracts for inventories of all administrative and public use bridge on refuges and hatcheries. The bridge inventory and condition assessment is done on a three year cycle, and the results of the assessments are provided to Federal Highway Administration (FHWA) for inclusion in the National Bridge Inventory System.

Transit Needs Study

The Federal Lands Alternative Transportation Systems Study, also referred to as the Section 3039 study, identified transit needs at 13 of the 23 Service facilities that were reviewed during the course of the study. The study identified a range of needs both within refuges and in conjunction with nearby Federal and State agencies and neighboring communities. Recommended enhancements included a range of options, including: separating pedestrians from the roadways; bicycle paths, bus/shuttle/tram systems and ferry boats.

A comprehensive inventory and condition assessment was conducted

Bridges are monitored by the Service and condition assessments are sent to FHWA

Transit needs have been identified

Service Planning

The Service is engaged in a system-wide comprehensive conservation planning effort mandated with the passage of the Refuge Improvement Act in 1997. This planning process includes transportation planning as a required element in the comprehensive conservation plans.

As a part of the planning process, the Service will conduct reviews for all public use programs. The current and future needs for public use roads, parking lots, trails and transit systems will be assessed.

The Service includes State and local agencies in the comprehensive planning process. The FLH office are provided with a list of proposed projects being funded under the Refuge Roads program. The FLH Divisions make these lists available to the states.

Participation in State and Local Transportation Planning Activities

The Service has undertaken some specific efforts to involve State and local governments. At the Don Edwards San Francisco Bay Refuge, the State of California has been requested to help in developing transportation projects with the refuge. At the Rocky Mountain Arsenal, the Denver Metropolitan Planning Organization is working with the Service in developing transportation plans to facilitate visitation to the refuge. The Desert Refuge Complex is developing a transportation plan that incorporates the developmental impacts of the City of Las Vegas on refuge public use management plans.

Additional coordination and information sharing meetings will be undertaken with Federal Lands Highways, State Departments of Transportation, local governments and organizations in the coming years.

System-wide comprehensive planning is underway

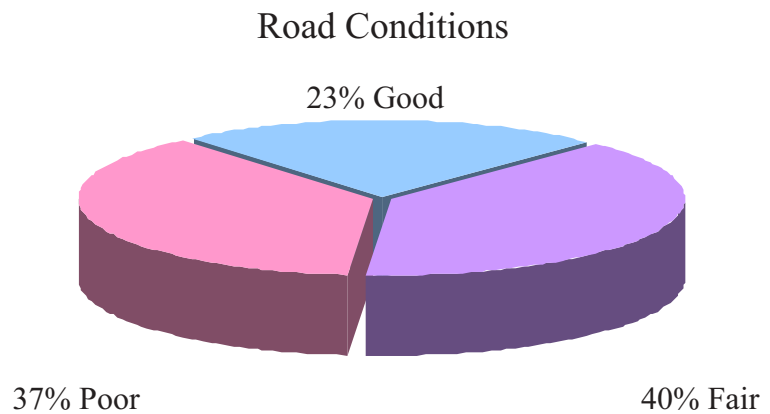
The State and local governments, non-governmental organizations, and the public are involved in the Service's planning efforts

Condition of Facilities

Public Roads

Condition assessment information provided by FHWA shows that only 23% of Service public road mileage were in good condition and that 37% of the road mileage were rated to be in poor condition.

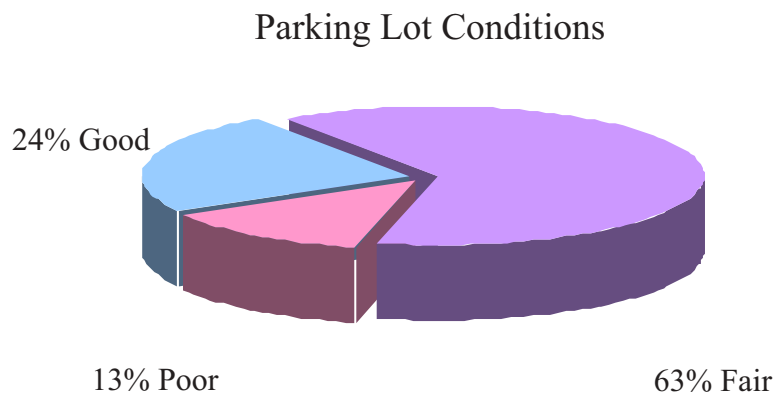
23% of roads were rated to be in good condition.



Parking Lots

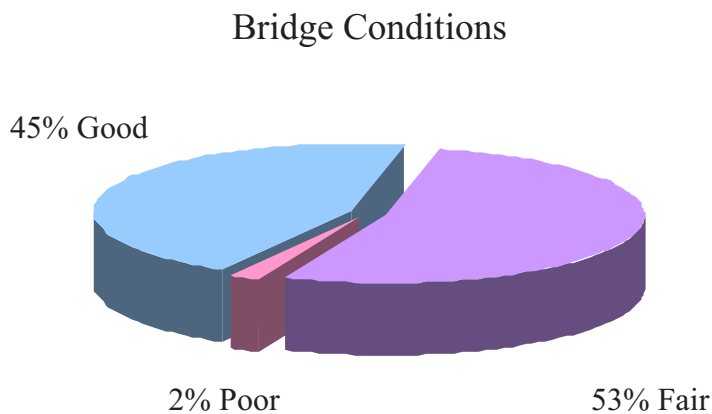
Condition assessment information provided by FHWA shows that 24% of Service parking lots were in good condition and that 13% of the parking lots were rated to be in poor condition.

24% of parking lots were rated to be in good condition.



Bridges

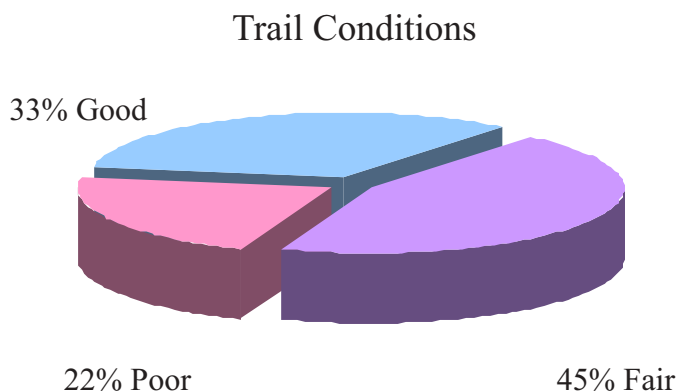
The Service has evaluated over 300 public bridges with openings over 10 feet in length.⁸ The relatively low percentage of bridges listed in poor condition (2%) is a reflection of the concerted effort the Service has made to improve bridge safety.



45% of bridges were rated to be in good condition.

Trails

Data provided by Service managers indicates that 33% of the foot trails and boardwalks were considered to be in good condition and that 22% were considered to be in poor condition.



33% of foot trails and boardwalks were rated to be in good condition.

Current Program

Prior to TEA-21, funding for public roads and bridges within the Refuge System had been funded through annual Department of the Interior appropriations under the resource management and construction accounts. Since no specific funding sources for public roads and bridges in the Department of the Interior appropriation were identified, road and bridge projects have had to compete for funding along with all other Service priorities.

The passage of TEA-21 authorized the Refuge Roads Program as part of the Federal Lands Highway Program. The Refuge Roads Program provides funding for the maintenance and improvement of public roads within the National Wildlife Refuge System. These funds can not be used to build new roads.

Administrative roads, bridges, and parking lots on refuges, and all roads, bridges and parking lots on hatcheries and administrative sites are funded with monies provided to the Service from the annual appropriations made to the Department of the Interior.

Refuge Roads Program

TEA-21 provided \$20,000,000 per year (approximately \$17M per year after obligation limitation adjustment) for the program. Obligations were approximately \$13.6M in FY 1999, \$15.4M in FY 2000 and \$19.5M in FY 2001.

An additional \$1,300,000 of Highway Trust Funds were provided in FY 2000. These funds were used to begin a comprehensive road inventory and condition assessment by FHWA. Refuge Roads funds were used to complete this project.

Appendix 3 shows the approved refuge roads projects by state.

TEA-21 authorized the establishment of the Refuge Roads maintenance and improvement program

\$17 million dollars was available each year from 1999-2003 to fund the Refuge Roads Program

Public Lands Discretionary

There were 31 projects worth \$20.5 million related to units of the Refuge System which were funded from Public Lands Discretionary Program between 1999 and 2002. Many of the projects involved improvements to state and county access roads leading to a refuge. Most of the work done on these projects was undertaken by the various state Departments of Transportation and FLH Divisions.

Section 1214 – Federal Activities

TEA-21 authorized five projects worth \$5.3 million at refuges in Rhode Island. At the end of FY 2001, three (runway removal, 2 entrance roads) of the five projects were completed. The Middletown Visitor Center is expected to be completed in 2002. The Rhode Island Education and Visitor Center is expected to be completed in 2003.

Emergency Relief For Federally Owned Roads

The Service benefited from funding and technical assistance provided by FLH for emergency relief. Between 1999 and 2001, nine projects in eight states received \$4.9 million to help repair storm damaged roads.

Participation in State Federal-Aid program

State Federal-Aid funds have been used to restore the fish car at the D.C. Booth Historic National Fish Hatchery (SD), improve parking at Oregon Islands (OR) and Sabine (LA), improve safety at San Luis (CA), and repave the entrance road (RI). The Service's ability to apply to the various state federal-aid programs has been successful in some states and challenging in others.

A guide to the State transportation enhancements program was developed to help Service field staff and local communities understand the transportation enhancements program.

About \$21 million of Public Lands Highway funds were awarded to improve access to and within Service facilities

Four Congressionally authorized projects completed

Emergency Relief funds helped restore public access and tourism, aiding recovery of small communities and their economies

Working with the states and local governments to increase participation in state programs

Transportation Needs

Public Roads:

For maintenance and improvements to the over 4,800 miles of roads shown in the public roads inventory, the FHWA funding needs estimate for Service roads is about \$1.8 billion.

Parking Lots:

For maintenance and improvements to about 5,000 parking lots shown in the inventory, the FHWA funding needs estimate for repairs to refuge and hatchery system parking lots is over \$93 million.

Bridges:

The Refuge Management Information System lists \$29 million of needed maintenance and improvements projects for public bridges found on refuges and hatcheries.

Trails:

The Refuge Management Information System lists \$32 million of needed maintenance and improvements projects for public recreational trails found on refuges and hatcheries.

Transit:

The Alternative Transportation Needs Study found transit needs for Service lands to be approximately \$59 million over a ten year period.⁹ Often improvements to Service transportation problems are closely related to problems in local communities. The potential intergovernmental transit issues make specific needs in this category difficult to assess.

\$1.8 billion is needed for roads

\$93 million is needed for parking lots

\$29 million is needed for bridges

\$32 million is needed for recreational trails

\$59 million is needed for alternative transportation

Reauthorization Recommendations

- **Reauthorize the Federal Lands Highway Program and Refuge Roads Program and increase funding**
- **Expand program to include hatcheries**
23 USC 204(k)(1)(A) and (B) should be modified to include the public roads (approximately 40 miles) in the National Fish Hatchery System as part of the Refuge Roads program.
- **Authorize maintenance and improvement of trails**
23 USC 204(k)(1)(A) should be modified to allow up to 5% of the Refuge Roads funding to be use for the maintenance and improvement of recreational trails.
- **Authorize improvements for interpretive signage**
23 USC 204(k)(1)(B) should be modified to include the category of interpretive signage - (3) under subsection (h).
- **Exemption from Section 4f**
23 USC 138 and 49 USC 303 should be modified to exempt agency managed Federal Lands Highway projects funded under 23 USC 204 from the requirements of Section 4f.
- **Exemption from Section 1102(f)**
The Federal Lands Highway programs listed under 23 USC 204 should be exempt from the provisions of Section 1102(f).
- **Reauthorize the:**
National Scenic Byways, Public Lands Discretionary, Emergency Relief for Federally Owned Roads, Recreational Trails, and Transportation Enhancements. Funding for these important programs needs to be increased.

Reauthorize Federal Lands Highways and Refuge Roads

Include Hatcheries

Include Trails

Allow for interpretive signage

4f Exemption

1102(f) Exemption

Reauthorize Other Important Programs

Reauthorization Funding

\$50 million/year is recommended for roads

Four options were considered for improving roadway conditions over the next ten years. The options included improving the average road condition to good on:

- a) 85% of Service roads (\$130 million/year);
- b) 70% of Service roads (\$80 million/year);
- c) 60% of Service roads (\$60 million/year); and
- d) 50% of Service roads (\$50 million/year).

Option d is recommended.

\$6 million/year is recommended for parking

Two options were considered for improving parking lot conditions over the next ten years. The options included improving the average parking lot condition to good on:

- a) 85% of parking lots (\$9 million/year); and
- b) 70% of parking lots (\$6 million/year).

Option b is the recommended.

\$4 million/year is recommended for bridges

Two options were considered for improving and maintaining bridges over the next ten years. The options included improving the average bridge condition to good on:

- a) 85% of bridges (\$8 million/year); and
- b) 70% of bridges (\$4 million/year).

Option b is the recommended.

\$3 million/year is recommended for trails

Two options were considered for improving trails over the next ten years. The options included improving the average trail condition to good on:

- a) 85% of trails (\$6 million/year); and
- b) 70% of trails (\$3 million/year).

Option b is recommended.

\$5.9 million/year is recommended for transit

The Alternative Transportation Needs Study documented transit needs related to the National Wildlife Refuge System and recommended funding levels of \$5.9 million/year.

References

¹ Report of Lands Under Control of the U.S. Fish & Wildlife Service as of September 30, 2001.

² Information based upon the Fish and Wildlife Service Real Property Inventory, as of September 27, 2001, with adjustments to the public use road mileage based upon the results of the public use road and parking lot inventory conducted by the Federal Lands Highway Divisions as of April 8, 2002.

³ Congressional Resolution No. 22, dated March 3, 1869. Resolution established the Saint Paul and Saint George Islands in Alaska as a special reservation to protect the fur seal.

⁴ Unnumbered Executive Order, dated March 14, 1903. The Executive Order reserved Pelican Island as a preserve and breeding ground for native birds.

⁵ The number of visitors for FY 2001 was based on information obtained from the Refuge Management Information System. The estimated number of visitors for FY 2002 is based upon the average rate of growth during the 1995-2001 time period.

⁶ The figures for regional sales, employment levels and employment income were estimated for FY 2001 based upon the FY 1995 information provided in “Banking on Nature: Economic Benefits to Local Communities of National Wildlife Refuge Visitation” (FWS, Division of Economics, July 1997) and adjusted using the CPI calculator of the Federal Reserve Bank of Minneapolis (<http://minneapolisfed.org/economy/cpihome.htm>).

⁷ The figures for regional sales and employment income were estimated for FY 2009 based upon the estimates for FY 2001 adjusted for the increase in projected visitation.

⁸ Information based upon the Fish and Wildlife Service Real Property Inventory as of September 27, 2001.

⁹ Federal Lands Alternative Transportation Systems Study Congressional Report, May 2001, Table 2 Potential ATS Needs by Agency, System Status, and Type of Expenditure.

Appendix 1. Fish and Wildlife Service Mileage and Bridges by State.

State/Associated Government	No. Units	Acreage	Public Use Roads (miles)	Admin. Roads (miles)	Public Use Bridges	Admin. Bridges
Alabama	9	58,109	70	63	1	0
Alaska	49	76,739,495	57	20	3	0
American Samoa	1	39,066	0	0	0	0
Arizona	15	1,719,249	130	634	1	0
Arkansas	13	359,475	277	208	3	1
California	42	473,294	178	246	1	11
Colorado	11	84,521	57	18	0	0
Connecticut	1	836	1	3	0	0
Delaware	2	25,783	11	8	1	0
Florida	30	977,791	213	143	0	5
Georgia	10	480,616	77	41	0	0
Guam	1	23,228	2	0	0	0
Hawaii	13	299,406	5	145	0	0
Idaho	15	92,016	57	47	7	2
Illinois	11	138,473	78	134	1	2
Indiana	3	64,516	26	1	32	0
Insular Possessions	8	1,291,882	0	0	0	0
Iowa	9	110,485	20	16	4	0
Kansas	5	58,695	70	33	10	1
Kentucky	3	9,078	9	4	0	0
Louisiana	22	528,444	113	39	7	29
Maine	12	58,043	16	61	0	0
Maryland	6	44,792	47	31	0	1
Massachusetts	13	16,645	11	19	0	0
Michigan	12	115,517	24	123	11	0
Minnesota	22	542,970	110	74	7	2
Mississippi	12	225,037	134	77	16	3
Missouri	12	70,859	64	55	5	1
Montana	35	1,309,620	808	677	15	6
Nebraska	7	178,337	102	50	1	7
Nevada	11	2,387,644	345	312	12	10

State/Associated Government	No. Units	Acreage	Public Use Roads (miles)	Admin. Roads (miles)	Public Use Bridges	Admin. Bridges
New Hampshire	5	7,618	3	20	0	0
New Jersey	5	66,159	12	23	3	2
New Mexico	11	385,084	38	342	3	0
New York	11	28,508	16	12	0	0
North Carolina	12	425,074	265	335	4	1
North Dakota	77	1,531,311	232	94	5	28
Ohio	3	8,879	6	6	1	0
Oklahoma	10	167,893	88	119	1	0
Oregon	28	606,434	126	168	15	12
Pennsylvania	5	10,048	4	13	0	3
Puerto Rico	5	7,927	1	19	0	0
Rhode Island	5	2,153	1	5	0	0
South Carolina	9	162,373	190	186	1	1
South Dakota	13	1,238,875	62	13	0	0
Tennessee	8	115,468	94	97	2	1
Texas	22	530,257	118	300	5	8
Utah	9	111,936	76	9	3	1
Vermont	3	32,967	61	5	6	0
Virgin Islands	3	570	2	2	0	0
Virginia	13	132,504	89	77	1	1
Washington	39	345,132	149	218	7	8
West Virginia	3	6,615	4	5	0	0
Wisconsin	10	235,622	26	20	1	1
Wyoming	15	99,624	44	29	2	2

Notes:

- 1) Number of units (refuges, wetland management districts, coordination areas, fish hatcheries, administrative sites) and acreage based on the Report of Lands Under Control of the U.S. Fish and Wildlife Service as of September 30, 2001.
- 2) All mileage data is expressed in linear length not lane miles. Road mileage for public use roads based upon data from the Federal Highway Administration's refuge road inventory data collection, current as of April 8, 2002. Road mileage for administrative roads, and the number of public use bridges and administrative bridges was obtained from the Service's real property inventory, current as of March 30, 2001.

Appendix 2. Fish and Wildlife Service Public Use and Estimated Economic Benefits by State.

State/Associated Government	No. Units	Acreage	Visitors	Estimated Economic Benefits
Alabama	9	58,109	1,026,673	\$451,700,000
Alaska	49	76,739,495	728,047	\$320,300,000
American Samoa	1	39,066	0	\$0
Arizona	15	1,719,249	1,638,675	\$721,000,000
Arkansas	13	359,475	684,503	\$301,000,000
California	42	473,294	1,286,722	\$566,200,000
Colorado	11	84,521	67,026	\$29,500,000
Connecticut	1	836	29,194	\$12,900,000
Delaware	2	25,783	216,055	\$95,000,000
Florida	30	977,791	2,965,347	\$1,304,800,000
Georgia	10	480,616	602,642	\$265,200,000
Guam	1	23,228	55,245	\$24,300,000
Hawaii	13	299,406	402,934	\$177,300,000
Idaho	15	92,016	138,674	\$61,000,000
Illinois	11	138,473	2,079,492	\$915,000,000
Indiana	3	64,516	213,748	\$94,000,000
Insular Possessions	8	1,291,882	15	\$7,000
Iowa	9	110,485	1,020,000	\$448,800,000
Kansas	5	58,695	345,670	\$152,100,000
Kentucky	3	9,078	5,687	\$2,500,000
Louisiana	22	528,444	547,606	\$241,000,000
Maine	12	58,043	355,860	\$156,600,000
Maryland	6	44,792	738,940	\$325,200,000
Massachusetts	13	16,645	1,173,807	\$516,500,000
Michigan	12	115,517	135,999	\$59,800,000
Minnesota	22	542,970	4,267,358	\$1,877,600,000
Mississippi	12	225,037	381,598	\$167,900,000
Missouri	12	70,859	426,660	\$187,700,000
Montana	35	1,309,620	641,842	\$282,400,000
Nebraska	7	178,337	255,865	\$112,600,000
Nevada	11	2,387,644	231,053	\$101,700,000

State/Associated Government	No. Units	Acreage	Visitors	Estimated Economic Benefits
New Hampshire	5	7,618	112,600	\$49,500,000
New Jersey	5	66,159	573,728	\$252,400,000
New Mexico	11	385,084	239,938	\$105,600,000
New York	11	28,508	688,402	\$302,900,000
North Carolina	12	425,074	3,119,848	\$1,372,700,000
North Dakota	77	1,531,311	394,581	\$173,600,000
Ohio	3	8,879	117,252	\$51,600,000
Oklahoma	10	167,893	1,803,078	\$793,400,000
Oregon	28	606,434	1,329,276	\$584,900,000
Pennsylvania	5	10,048	160,086	\$70,400,000
Puerto Rico	5	7,927	32,500	\$14,300,000
Rhode Island	5	2,153	384,000	\$169,000,000
South Carolina	9	162,373	601,901	\$264,800,000
South Dakota	13	1,238,875	208,662	\$91,800,000
Tennessee	8	115,468	1,083,761	\$476,900,000
Texas	22	530,257	914,916	\$402,600,000
Utah	9	111,936	66,937	\$29,500,000
Vermont	3	32,967	20,575	\$9,100,000
Virgin Islands	3	570	8,720	\$3,800,000
Virginia	13	132,504	1,672,561	\$735,900,000
Washington	39	345,132	740,438	\$325,800,000
West Virginia	3	6,615	68,571	\$30,200,000
Wisconsin	10	235,622	743,519	\$327,100,000
Wyoming	15	99,624	898,228	\$395,200,000
Total			38,647,015	\$17,004,700,000

Notes:

- 1) Number of units (refuges, wetland management districts, coordination areas, fish hatcheries, administrative sites) and acreage based on the Report of Lands Under Control of the U.S. Fish and Wildlife Service as of September 30, 2001.
- 2) Visitor information obtained from the National Wildlife Refuge System's FY 2001 Public Use database as of October 30, 2001.
- 3) Based on the 1996 National Survey of Hunting, Fishing, and Wildlife Associated Recreation (www.census.gov/prod/3/97pubs/fhw96nat.pdf), visitors to refuges and hatcheries are estimated to spend an average of \$440 per person per trip (1996 estimates, unadjusted to reflect 2001 costs).

**Appendix 3. 1999-2002 Fish and Wildlife Service Refuge Roads Projects by State with Approved Funding
(Note: actual project costs will not be known until project completion)**

State	Refuge/WMD	Improvements	Funding Approved
AK	Alaska Peninsula	Re-grade/resurface refuge headquarters parking	\$165,580
AK	Alaska Maritime	Visitor Center Parking	\$925,000
AK	Izembek	Replace 1 bridge, repair 2 bridges	\$400,000
AK	Yukon Delta	Repair and pave road and parking lot	\$100,000
AR	Bald Knob	Rehabilitate 8 roads	\$2,490,000
AR	Cache River	Rehab Headquarters/Office Driveway	\$110,000
AR	White River	Repair roads, replace Brushy Creek bridge	\$1,975,000
AZ	Buenos Aires	Repair entrance road and auto tour road.	\$1,430,000
AZ	Cibola	Rehabilitate 12 miles Public Use Roads	\$357,000
AZ	Imperial	Repair 8 miles of Red Cloud Mine Road	\$500,000
AZ	Kofa	Reshape and gravel 4 mi of Palm Canyon Road	\$225,000
AZ	San Bernadino	Repair 1 mile of entrance road and parking lot	\$124,000
CA	Colusa	repair unsafe bridge	\$30,000
CA	Humboldt Bay	Rehabilitate entrance road and parking	\$140,000
CA	Kern	Repairs to 4.2 mi auto tour route and 2 bridges	\$234,000
CA	Lower Klamath	resurface 16 mi. roads, 6 parking lots, replace 9 bridges	\$340,000
CA	Modoc	resurface entrance road and auto tour route	\$205,000
CA	Sacramento	Rehabilitate 24 turnouts on Tour route	\$34,000
CA	San Diego	Repair Millar Ranch Rd., Singer Lane Trailhead	\$300,000
CA	San Luis	safety improvements entrance roads	\$315,000
CA	Sonny Bono Salton Sea	Repairs to Vandal Rd and 2 parking lots	\$200,000
CO	Alamosa	Gravel auto tour route	\$220,000
CO	Monte Vista	Gravel auto tour route and Unit 20 pull-off.	\$275,000
CO	Two Ponds	Rehabilitate Parking Lot	\$200,000
DE	Bombay Hook	repairs to entrance road and parking lot	\$30,000
DE	Edwin B. Forsythe	Replace Great Creek Bridge	\$245,000
DE	Prime Hook	Resurface entrance road	\$350,000
FL	J.N. Ding Darling	Rebuild Wildlife Drive, parking lot, sidewalk	\$2,755,000
FL	Merritt Island	Resurface Bio Lab Rd, Black Point Drive construction	\$2,157,000
GA	Harris Neck	Resurface Barbour River Landing Rd, Entrance Rd	\$605,000
GA	Okefenokee	Resurface East Entrance Parking and Wildlife Drive	\$1,497,000
GA	Savannah	Resurface Laurel Hill Wildlife Drive	\$660,000
GU	Guam	Improve Entrance Road and Parking	\$512,000
HI	Hanalei	repair parking lot and overlook	\$91,000
HI	Kakahaia	rehabilitate entrance road and overlook parking area	\$109,000
HI	Kilauea Point	Repair access road and turnaround	\$625,000
HI	Pearl Harbor	rehab 1.3 km Honouliuli Entrance Rd.	\$145,000
IA	DeSoto	Repair and resurface roads	\$427,000
IA	Port Louisa	Resurface parking area at headquarters	\$120,000
IA	Upper MS River	Rehabilitate Parking Lots	\$40,000
ID	Bear Lake	Rainbow Dike access road	\$159,000
ID	Camas	Widen and regravell tour route, repair 8 bridges	\$800,000
ID	Grays Lake	Rehabilitate auto tour route	\$300,000
ID	Kootenai	rehab auto tour road	\$770,000
ID	Oxford Slough	rehabilitate access road (0.3 mi) and parking lot	\$54,000
IL	Chautauqua	Rehabilitate eroded surfacing Entrance Rd, Wildlife Dr	\$95,000
IL	Crab Orchard	Repairs to Auto Tour Route and Parking	\$800,000
IL	Mark Twain	Resurface roads and Swan Lake Parking Lot	\$440,000
IN	Muscatatuck	Safety improvements entrance road, guard rails	\$600,000
KS	Flint Hills	Replace Bridge, repair road	\$170,000
KS	Kirwin	Rehabilitate Auto Tour Route	\$680,000

KS State	Quivira Refuge/WMD	Rehabilitate 14 mi of road Improvements	\$192,500 Funding Approved
LA	Catahoula	Repairs to Duck Lake Road	\$1,600,000
LA	Sabine	Resurface West Cove parking lot and road	\$375,000
LA	Upper Ouachita	Repairs 4 access roads, Cecil Creek Bridge	\$677,000
MA	Great Meadows	Rehabilitate Entrance Road & Parking, Comfort Station	\$670,000
MA	Monomoy	Rehabilitate Parking Lot/Entrance Road	\$167,000
MA	Parker River	Entrance Road/Bridge/Parking Lot	\$1,084,000
MD	Blackwater	Pave office Entrance Road	\$123,000
MD	Patuxent	Rehabilitate VC Exit Rd, replace 2 bridges	\$3,008,000
ME	Moosehorn	Replace Tyler and Howard Mill Bridges	\$214,000
ME	Petit Manan	Rehabilitate Petit Manan Point Road	\$167,100
ME	Rachel Carson	Repair entrance road	\$45,000
MI	Seney	Repair deficiencies on bridges	\$152,000
MN	Agassiz	Resurface entrance road and parking lot	\$160,000
MN	Big Stone	Safety Improvements Auto Tour Road Bridge	\$125,000
MN	Detroit Lakes	Resurface parking lot and access road	\$147,000
MN	Litchfield	Repair Eroded Parking Lots and Access Roads	\$45,000
MN	Rice Lake	Repair Surface on Public Roads	\$18,000
MN	Rydell	Repair Wildlife Drive and Headquarters Parking Lot.	\$24,000
MN	Sherburne	Repair parking lots	\$182,000
MN	St. Croix	Repair Eroded Access Roads and Parking	\$57,000
MN	Tamarac	Repair Roads and Auto Tour Route.	\$59,000
MN	Upper MS River	Repair McNally and Peterson Lake parking areas	\$500,000
MN	Windom	Pave entrance road and parking lot	\$250,000
MO	Mingo	Replace bridge, repair tour route and parking lots	\$976,000
MO	Squaw Creek	Repair Tour Route and Mallard Marsh Rd	\$56,000
MO	Two Rivers	Resurface Swan Lake and Headquarters Parking Lots	\$247,000
MS	Noxubee	Rehabilitate surface and base on 21 roads	\$1,500,000
MT	Benton Lake	Replace guard rails, warning signs 3 bridges	\$31,500
MT	Bowdoin	Gravel auto tour route	\$305,000
MT	Charles M. Russell	Repair Rock Creek Rd, Crooked Creek Rd	\$1,490,000
MT	Medicine Lake	Repair Parking Lot	\$17,000
MT	National Bison	Rehabilitate entrance area	\$525,000
ND	Des Lacs	Re-pave entrance road	\$239,000
ND	Upper Souris	Pave Headquarters Parking Lot and Entrance Road	\$130,000
NE	Valentine	Gravel Little Hay Road	\$512,000
NJ	Edwin B. Forsythe	Replace Great Creek Bridges	\$387,000
NJ	Great Swamp	Rehabilitate entrance Road Repaving	\$232,000
NJ	Wallkill River	Rehabilitate Office driveway, entrance road, parking lot	\$613,000
NM	Bitter Lake	Entrance road resurfacing, road realignment	\$425,000
NM	Bosque del Apache	Repair road base, replace gravel, pave parking	\$817,000
NM	Sevilleta	Resurface entrance road and parking lot	\$315,000
NV	Ash Meadows	Regravel 18 mi public use roads	\$75,000
NV	Desert	improve roads, parking	\$310,000
NV	Pahranagat	repair entrance and access roads	\$340,000
NV	Ruby Lake	repairs roads, parking lot, restroom	\$700,000
NV	Sheldon	Rehabilitate Sheldon road 34A and rest areas	\$671,000
NV	Stillwater	rehab 5 bridges, replace 1 bridge	\$242,000
NY	FH Interest of NY	entrance road bridge	\$250,000
NY	Wertheim	Pave entrance road, add restroom facilities	\$248,000
OH	Ottawa	Safety Improvements - Turn Lanes	\$50,000
OK	Tishomingo	Repair and resurface 12 miles road	\$485,000
OR	Bandon Marsh	Parking lot improvements	\$156,000
OR	Hart Mountain	Repairs to Hart Mtn. access road and bridge	\$300,000

State	Refuge/WMD	Improvements	Funding Approved
OR	Malheur	Replace 10 bridges and repair Krumbo Road	\$2,500,000
OR	McKay Creek	Repair entrance road and parking lots	\$180,000
OR	Oregon Islands	Shell Island & Simpson Reef Overlook	\$62,000
OR	Umatilla	Rehab turnouts and parking on tour route	\$29,000
PA	John Heinz	Replace Entrance Road and Parking Lot	\$680,000
SD	Lake Andes	Replace South Dike Bridge	\$425,000
SD	Madison WMD	Rehabilitate entrance road	\$80,000
SD	Waubay	Improve Entrance Road	\$62,000
TN	Hatchie	Bridge Improvements	\$375,000
TN	Reelfoot	Grassy Island Tour Road and Visitor Center Road	\$1,200,000
TX	Anahuac	Reshape and regravol 6 mi road	\$367,000
TX	Brazoria	Repairs to roadways	\$1,000,000
TX	Laguna Atascosa	Repair Bayside Drive Tour Road	\$1,255,000
TX	Santa Ana	Repairs to auto tour route	\$451,000
UT	Bear River	Replace flood destroyed entrance roads to ed center	\$800,000
UT	Fish Springs	Regravel Tour Route	\$127,000
UT	Ouray	Rehabilitate Auto Tour Route	\$150,000
VA	Chincoteague	Rehabilitate Wildlife Loop Road	\$41,000
VA	Eastern Shore of VA	Pave dirt and gravel Visitor Center parking lot.	\$104,000
VA	Great Dismal Swamp	Rehabilitate Access Roads, bridge railings	\$262,000
VA	Occoquan Bay	parking area and auto tour route	\$153,000
VT	Silvio O. Conte	Improvements to road and bridge	\$182,000
WA	Columbia	Repair entrance road and lake access road	\$370,000
WA	Conboy Lake	Regravel entrance road, turnouts	\$150,000
WA	Julia Butler Hansen	Pave entrance road and parking	\$320,000
WA	Little Pend Oreille	Gravel 48+ km of roads, replace bridge	\$901,000
WA	McNary	repair entrance road and parking	\$77,000
WA	Ridgefield	Repair entrance road, tour route, rest areas	\$600,000
WA	Steigerwald Lake	Improve road, parking, rest area	\$110,000
WA	Turnbull	Rehabilitate tour route and parking	\$290,000
WA	Willapa	Rehab entrance road, turnouts and parking	\$505,000
WA	William L. Finley	Rehab tour route, parking lot,	\$225,000
WI	Horicon	Resurface Tour Route, Entrance Rd and parking	\$1,350,000
WI	Necedah	Repair surfacing on parking areas and roads.	\$79,000
WI	Trempealeau	Repair approach rails on the Trempealeau River Bridge.	\$23,000
WI	Upper MS River	Repair Public Use Roads and Parking Lots.	\$118,000
WV	Canaan Valley	Road/parking lot repairs	\$50,000
WY	National Elk	Rehabilitate Flat Creek Road.	\$700,000