Costs of Providing Public Campgrounds in Oregon and Idaho

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Abstract

A cooperative study by researchers from Oregon and Idaho explores the costs of providing overnight camping facilities in selected areas of the two states. Campgrounds administered by the Forest Service, U.S. Department of Agriculture, and the state management agencies are included in this report. Costs are also compared to revenues generated at these facilities.

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SUMMARY AND CONCLUSIONS

The objective of this report is to present a description of the cost structure of selected publicly provided camping facilities in Oregon and Idaho. Public provision of camping facilities is common in the west because of the large amount of land under public control. However, little research data presented here are designed to partially fill this informational void by presenting cost data for campgrounds provided by three agencies: the Forest Service of the U.S. Department of Agriculture, the Oregon State Parks and Recreation Division, and the Idaho Department of Parks and Recreation.

The results reported here were obtained from two studies. One investigated the cost of providing Forest Service and state campgrounds on the Oregon coast; the other analyzed the cost of providing Forest Service and state campgrounds at Priest Lake, Idaho. The results are reported jointly in this publication to provide, as comprehensive as possible, an analysis of the cost structure for public camping facilities. Although the years of analysis vary, similar procedures were used to estimate costs in the two studies. The level of improvements provided within the campgrounds also is highly variable.

Replacement costs, amortized replacement costs, and operation and maintenance (O & M) costs were estimated for each campground. These costs are reported on a campground, campsite, and camper unit basis. Replacement costs represent the cost of replacing the facilities in the year of analysis; the amortized replacement costs are a measure of the annual cost during each year of life of the campground required to recover replacement costs and interest. O & M costs represent the cost of operating the campgrounds during the year of analysis. The cost data for the four sets of facilities are summarized in Appendix Table 1.

Several conclusions can be drawn from the study. One relates to the size of the campground and the provision of certain improvements. Some improvements are "lumpy." Comfort stations, for example, are expensive and can serve a wide range of campsites. Replacement costs per campsite can be reduced if these types of "lumpy" facilities are designed to serve as many campsites as possible within health and convenience standards.

The analysis of the data also suggests that operation and maintenance costs do not increase proportionally with the level of use. Although operation and maintenance costs are variable costs, some of these costs seem to become "fixed" over a wide range in occupancy rates for a given facility. Therefore, even though operation and maintenance costs per campsite increase in response to increases in the occupancy rates, O & M costs per <u>camper unit</u> may decline or remain relatively constant. This phenomenon is illustrated in the Appendix table. O & M costs per campsite for the Oregon State Parks and Recreation Division campgrounds are $110 more than O & M costs per campsite for Idaho Department of Parks and Recreation campgrounds at Priest Lake. However, O & M costs per camper unit for the Oregon facilities are less than the O & M costs per camper unit for the Idaho facilities. Campsites in the Oregon facilities were occupied an average of 100 nights during the year of analysis as compared to only 74 nights for the Idaho facilities. The same phenomenon exists among individual campgrounds of comparable size, age, and level of development.

Even if O & M costs per camper unit increase slightly with increases in the rate of occupancy, total annual costs per camper unit will still decline if the rate of increase in O & M costs per camper unit is less than the rate of decrease in amortized replacement costs (fixed costs) per camper unit. If this is a typical situation, it may have useful policy implications. If total costs per camper unit decline as the level of occupany increases, agencies can

reduce costs per camper unit by increasing occupancy. One way to increase the rate of utilization of campgrounds is to base decisions on campground size or capacity on base period demand rather than peak period demand. Projections for future facility needs are often based on peak demand and agencies have, at least implicitly, sought to provide facilities to satisfy peak demand. But, such a policy results in excess capacity in off-peak or base periods and increases the costs per camper unit of providing the campground services. If agencies want to minimize the cost per camper party, decisions regarding campground size should be based on the level of off-peak demand. A variable fee structure which would change higher fees during periods of peak demand might also serve to change the use pattern of these facilities in such a way that greater use could be made of a given level of capacity, reducing total costs per camper party. Decisions to add to the capacity of public facilities and how to price the use of these facilities have obvious implications for the role and economic viability of commercial campgrounds provided by the private sector.

Finally, a comparison of costs and revenue from user fees indicates that user fees did not cover O & M costs for any of the four sets of facilities. Furthermore, revenue only covered 22 percent and 17.5 percent, respectively, of the total annual costs for Idaho State and Forest Service campgrounds at Priest Lake. Revenue collected by the Oregon State Parks and Recreation Division covered 51 percent of total annual costs. Hence, even in the most favorable situation, user fees only paid about one-half of the total annual costs of providing the facilities. Clearly, other sources of revenue must be used to cover the remaining costs. One method that is used by the State of Oregon is a tax or license fee on recreational vehicles.

Some would classify the Oregon recreational vehicle license fee as a "user fee." That was not done in this report because of the imperfect correspondence between the assessment of this fee and use of Oregon State Parks by

those who pay it. The fee is assessed on the basis of the type and size of the recreational vehicle. State parks are not used exclusively by recreational vehicle owners. Hence, some Oregon users (such as tent campers) escape from the payment of this fee altogether. Furthermore, not all Oregon recreational vehicle owners use state parks. Those who use them do not necessarily do so in proportion to the size of the fee paid by them. Nevertheless, the collection and use of these fees are important considerations in policy discussions about financing state park facilities. The existence of these fees leads to a shift in the cost burden from the general public to recreational vehicle owners who, as a group, are more likely to use these facilities than the public in general. During the 1977-78 biennium, about one-third of total state parks revenues were expected to come from this source (Oregon State Parks System Plan, p. 154).

The data reported in this study document the costs of providing public camping facilities and the share of these costs paid directly by campers through user fees. The attendant issue of how the remaining costs should be paid is beyond the scope of this study. However, this is an important question, especially in light of the magnitude of the costs delineated in this study. A greater awareness of the costs of providing public facilities may stimulate interest in the question of who should pay these costs.

COSTS OF PROVIDING PUBLIC CAMPGROUNDS IN OREGON AND IDAHO

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INTRODUCTION

Camping is a popular recreational activity today. This popularity is largely caused by the diverse motivations that exist for it. Some people camp to enjoy the camping experience itself. Others do so to reduce costs while traveling. A major part of the camping activity results from the desire of people to participate in other outdoor recreational results. For example, people often combine camping with fishing, hunting, and boating while engaged in outdoor recreation. Hence, camping is a means to an end as well as an end in itself.

Historically, the public sector has been the major supplier of overnight camping facilities in the West. This stems in large part, from the vast amount of land in public ownership in the region. Because of their relatively remote location, utilization of these lands for recreation often requires providing overnight camping facilities. Agencies with management responsibility have responded to this need; for example, the Forest Service of the U.S. Department of Agriculture currently operates more than 1,000 campgrounds in Washington and Oregon.

While it is easy to document the need for overnight camping facilities on public lands, it is somewhat surprising that so little attention has been given to the cost of providing these facilities. Public provision of campgrounds requires large amounts of capital investment funds and operating expenditures. However, the magnitude of these costs is not well known. In addition, the economic efficiency and equity questions relating to the recovery of these costs have not been investigated. Although it is generally thought that users pay less than the total costs through user fees, the exact size of the deficit incurred to provide these facilities has not been determined.

The objective of this report is to present data relating to the cost of providing public campgrounds. Detailed estimates of capital costs and operation and maintenance costs are reported for selected campgrounds. Furthermore, the revenues from campground user fees are compared with the costs of providing the facilities to determine the difference between user fee revenue and costs for selected public camping facilities in Oregon and Idaho.

This publication reports the results of two studies [Reiling, 1976, and White, 1977]. The first determined the cost of constructing and maintaining publicly provided campgrounds along the Oregon Coast. The second estimated the costs of providing public campgrounds at Priest Lake, Idaho. The two studies utilized the same techniques to estimate costs and campare revenues and costs. However, they were conducted in different years. There are also differences in the physical facilities provided in the campgrounds analyzed in these studies. Hence, it is hazardous to make direct comparisons between the results from the two studies. The primary purpose for reporting these results jointly was not to constrast results, but rather to broaden the description of the phenomenon in question: the cost structure of publicly provided overnight camping facilities.

Campgrounds operated by three agencies are considered here. Forest Service facilities are analyzed first, beginning with those provided by the Siuslaw National Forest in western Oregon. Data for the Forest Service facilities at Priest Lake, Idaho, are considered next. Finally, data for campgrounds provided by Oregon and Idaho are analyzed. The presentation of these data is preceded by a short discussion of the methods used to estimate the total cost of providing the public facilities.

CALCULATING TOTAL COSTS OF PUBLIC FACILITIES

One of the primary objectives of the Oregon study was to compare the cost and fee structures of public and commercial campgrounds. Pricing schemes are an important management tool available to public agencies. Pricing policies can be designed to accomplish or encourage several things, such as allocating resources to their highest and best use, limiting the quantity demanded by users to the economically efficient quantity, and the recovery of some portion of the costs of providing the services. Public pricing schemes also may influence the commercial campground industry since camping facilities are goods that also could be provided by the private sector.

Since the recovery of total costs is a necessary condition for the long-run survival of commercial campgrounds, one of the objectives was to estimate the average fee required at public facilities to recover total costs, given the existing level of use of the campgrounds. This average fee could then be compared with the fee structure used in the commercial campground industry.

A question that had to be addressed was the "appropriate" components of total costs. Operation and maintenance (O & M) costs are one component. It is easily dealt with by tallying O & M costs. However, questions arise concerning the capital investment component of total costs. Two alternatives

were considered: amortization of the original construction costs and amortization of the replacement costs of the facilities. The second alternative was chosen for pragmatic and conceptual reasons. First, it was not possible to determine the actual construction costs because the facilities had been expanded over time and the expansions included the replacement of older facilities as well as the addition of new facilities. Therefore, use of the sum of total construction costs would result in counting some costs that should not be included since it was not possible to subtract the costs of facilities that no longer exist.

There is also a conceptual argument for not using the original construction costs for calculating the capital cost component of total costs. Historical construction costs are sunk costs that do not reflect the cost of replacing the facilities. Furthermore, recovery of sunk costs is of no significance in decisions concerning the future allocation of resources. Howe [1971] argues that replacement costs should be used as a basis for estimating capital costs, regardless of the level of actual historical costs. Use of the replacement cost of facilities as a component of total costs to determine fees forces the users to consider the full costs they impose on the providing agency if additional capacity is required. This point is particularly relevant for some campgrounds since excess demand exists during peak periods at the current fee level. Therefore, the use of replacement costs rather than historical construction costs provides a more accurate measure of the relevant agency costs of providing additional capacity. It also conforms more closely to the procedures used to estimate the cost structure of commercial operations because opportunity costs on invested capital were based on the current market value of the facilities rather than the original construction costs [Reiling and Stoevener, 1977]. Although

replacement costs may not equal the current market value, replacement costs more closely approximate market value of these facilities than do historical construction costs.

The use of replacement costs rather than original construction costs seems to be most appropriate for use in this study since the former best describes the costs associated with future allocation decisions. We recognize, however, that the use of replacement costs overestimates capital costs if one is only concerned with recovery of historical construction costs. Therefore, the reader should use caution in interpreting the capital costs reported below. Capital costs (and total costs) would be lower if the agency's goal was to recover sunk costs.

FOREST SERVICE FACILITIES ON THE OREGON COAST

The Siuslaw National Forest is the only federal agency that provides camping facilities on the Oregon coast. Its 15 coastal campgrounds are either adjacent to U.S. Highway 101 or are located between the highway and the ocean beaches. All but one (Sand Beach) of the campgrounds are on the central Oregon coast between Waldport and Coos Bay, and several of them lie within the Oregon Dunes National Recreation Area (ODNRA). The facilities are highly developed by Forest Service standards. For example, most of the campgrounds have surfaced roads and flush toilet facilities.

The Costs of Providing Forest Service Campgrounds on the Oregon Coast

Three types of economic costs were calculated for each of the 15 U.S. Forest Service campgrounds on the Oregon coast. They are the 1974 replacement costs of the campgrounds, the annual amortized capital costs, and operation and maintenance costs. Each of the costs and the manner in which they were estimated are discussed below.

Replacement Costs

As noted above, the replacement cost approach was used to estimate the value of capital improvements in the campgrounds. Although they may not represent the current market value of the improvements, the replacement cost estimates indicate the level of costs the agency would have to pay if it were necessary to add significantly to the stock of existing camping facilities. It should be noted that land costs are not included in the cost estimates presented below because the land is in public ownership. Opportunity costs reflecting other possible uses for the land under public ownership are not included either. The 1974 replacement costs of items found in the campgrounds as reported in Table 1. These costs were used to determine the replacement cost of each campground. The latter are shown in Table 2.

In total dollars, Siltcoos and Eel Creek campgrounds had the highest replacement costs, $386,348 and $289,052, respectively. The lowest estimated replacement cost was $18,661 for Carter Lake. The total replacement cost for all 15 campgrounds in 1974 was estimated to be $2,121,671, or an average of $141,445 per campground. In terms of replacement cost per campsite, West Carter Lake had the highest cost, more than $7,600; the per campsite replacement cost for Carter Lake was only $1,696. The 1974 average replacement cost per campsite for all 15 campgrounds was $3,406.

The wide range in replacement cost per campsite can be explained by the quantity and type of facilities provided. For example, West Carter Lake has an unusually large amount of traffic control barriers. It also contains two large comfort stations. Most campgrounds of comparable size contain only one comfort station. However, the facilities in this campground are spread over a larger area and two comfort stations are required. Since comfort stations and traffic control barriers are two of the more expensive items in the

Table 1. Estimated Cost and Expected Life of Items in Forest Service Campgrounds on the Oregon Coast

Item	Unit of Measure	Estimated Cost	Expected Life (years)
Paved Road	Mile	$ 52,610	20
Surfaced Road	Mile	44,192	10
Single Car Spur (paved)	Each	374-498	20
Single Car Spur (surfaced)	Each	314-418	10
Double Car Spur (paved)	Each	540-664	20
Double Car Spur (surfaced)	Each	454-558	10
Car & Trailer Spur (paved)	Each	374-498	20
Car & Trailer Spur (surfaced)	Each	314-418	10
Parking Lot (paved)	1,000 sq. ft.	830	20
Parking Lot (surfaced)	1,000 sq. ft.	700	10
Trails (surfaced)	1,000 lin.ft.	2,995	10
Trails (unsurfaced)	1,000 lin.ft.	1,969	10
Trails (paved)	1,000 lin.ft.	3,594	20
Heavy Wood Tables	Each	180	10
Concrete Tables	Each	315	10
Fireplaces	Each	57	5
Campstoves	Each	86	5
Fire Rings	Each	84	10
Benches	Each	395	20
Traffic Control (concrete posts)	1,000 lin.ft.	4,976	20
Spur Posts	Each	14	5
Concrete Barrier Logs	Each	33	20
Garbage Container Base	Each	21	20
Garbage Container	Each	11	5
Bulletin Boards	Each	5,310	1
Water Line Costs	1,000 lin.ft.	135	20
Rip-Rap	1,000 lin.ft.	14,000	20
Waste Water Sumps			
a. Large	Each	927	8
b. Small	Each	325	8
c. Self-Contained	Each	373	8
Power Pump w/Controls (water)	Each	2,500	10
Hand Pumps (water)	Each	1,160	10
Wells (drilled & cased)	Foot	15	20
Closed Water Tanks	1,000 gal.	800	20
Water Chlorinator	Each	550	20
Comfort Station (06)	Each	10,572	20
Comfort Station (08)	Each	14,503	20
Comfort Station (10)	Each	15,808	20
Septic Tank & Drainfield (06)	Each	4,344	20
Septic Tank & Drainfield (08 & 10)	Each	4,803	20
Vault Toilet Building	Each	1,500	20
Pit Toilet Building	Each	800	10
Flush Toilet Seats	Each	145	10
Pit & Vault Toilet Seats	Each	47	10
Utility Building (Pumphouse)	1 sq.ft.	10	10

(continued)

Table 1. (continued)

Item	Unit of Measure	Estimated Cost	Expected Life (years)
Fence	Mile	$ 1,200	10
Tent Pad	Each	60	10
Road Gates	Each	300-500	3
Signs	Each	250	2
Grass	Acre	525	10
Beachgrass	1,000 sq.ft.	35.59	10
Pedestal Grill	Each	60	5
Sewage Treatment Facility	Each	31,050	20
Amphitheater	PAOT[a/]	25	10

[a/] PAOT is "persons at one time," a measure of capacity for amphitheaters.

Table 2. Estimated Total Replacement Cost per Campground and per Campsite for the 15 U.S. Forest Service Campgrounds on the Oregon Coast, 1974

Campground	Number of Campsites	Total Replacement Cost	Replacement Cost per Campsite
Sand Beach	101	$ 260,737	$2,582
Tillicum Beach	57	207,972	3,649
Rock Creek	16	76,603	4,788
Alder Lake	22	83,093	3,777
Dune Lake	17	71,184	4,184
Sutton Lake	30	99,139	3,305
Sutton Creek	63	189,081	3,001
Tyee	13	28,467	2,190
Siltcoos	110	386,348	3,512
West Carter Lake	22	168,912	7,678
Carter Lake	11	18,661	1,696
Tahkenitch Lake	44	105,190	2,391
Eel Creek	85	289,052	3,401
South Eel Creek	13	55,399	4,261
Bluebill Lake	19	81,843	4,307
Total	623	$2,121,671	
Average for all Campgrounds	41.53	$ 141,445	$3,406

construction of campgrounds, the replacement cost per campsite is higher than for other campgrounds.

Because of variations in facilities among the campgrounds and because of the way in which replacement costs were estimated, one cannot determine if economies of size exist in the construction of campgrounds. However, because of the "lumpiness" of certain items, it appears that campgrounds can be designed to reduce the construction cost per campsite. For example, a comfort station can serve one or 20 campsites. If campgrounds are designed so that comfort stations and other expensive and "lumpy" facilities serve as many campsites as possible, within health and convenience standards, the total construction cost per campsite could be reduced.

Amortized Replacement Costs

Investment costs (measured here as replacement costs) occur only once in the life of a project. To make them comparable to operating and maintenance costs (which occur annually), they are amortized. This is equivalent to making equal annual payments to cover charges for principal and interest until the cost of the project and interest on the capital have been fully paid at the end of the project's economic life. If policies were adopted that required the repayment of investment costs of campgrounds, the necessary payments probably would be calculated through amortization. Therefore, this procedure was used to calculate the annual capital costs.[1/]

Because the capital costs comprise a significant part of the total costs of providing overnight camping facilities and because of the controversy surrounding the choice of the "appropriate" discount rate, amortization costs were estimated for discount rates of 4 percent and 10 percent, in addition to 6.875 percent.[2/] The 4 percent rate represents the "real" average cost of federal borrowing while the 10 percent rate is an estimate of the real social opportunity cost of capital in the private economy.[3/] The 6.875 percent represents the rate established through compromise for use in federal project evaluations.

The annual amortized capital costs for each campground and each discount rate are reported in Table 3. Based on an interest rate of 6.875 percent, the 1974 total amortized capital cost for the 15 campgrounds was about $215,000.

1/ Once again it should be noted that the amortized costs reported here are based on replacement costs rather than original construction costs. Amortization of the original capital costs would result in lower capital cost than those estimated below.

2/ Determination of the "appropriate" discount rate has been discussed elsewhere and will not be considered here. The interested reader is referred to Baumol [1968], Marglin [1963], and Haveman [1968].

3/ The 4 percent and 10 percent rates are also used by Hanke et. al. [1975].

Table 3. Annual Amortized Capital Cost per Campground and per Campsite, for Discount Rates of 4.0, 6.875, and 10.0 percent, for Forest Service Campgrounds on the Oregon Coast, 1974

Campground	Annual Capital Costs; R = 4%		Annual Capital Costs; R = 6.875%		Annual Capital Costs; R = 10%	
	Total	Per Campsite	Total	per Campsite	Cost	per Campsite
Sand Beach	$21,457	$212	$26,475	$262	$32,542	$322
Tillicum Beach	17,566	308	20,489	359	27,115	476
Rock Creek	5,972	373	7,547	472	9,218	576
Alder Lake	7,082	322	9,051	411	10,353	471
Dune Lake	6,796	400	7,754	456	9,934	584
Sutton Lake	7,548	252	9,502	317	11,852	395
Sutton Creek	14,936	237	18,628	296	23,055	366
Tyee	3,238	249	3,773	290	4,367	336
Siltcoos	33,156	301	40,559	369	49,382	449
West Carter Lake	12,735	579	16,190	736	19,996	910
Carter Lake	1,988	181	2,334	212	2,739	249
Tahkenitch Lake	8,647	197	10,681	243	13,113	298
Eel Creek	22,833	269	28,477	335	35,244	415
South Eel Creek	4,376	337	5,458	420	6,775	521
Bluebill Lake	6,635	349	8,063	424	10,235	539
Total	$174,965		$214,981		$265,900	
Average	$ 11,664	$204	$ 14,332	$345	$ 17,728	$460

costs for individual campgrounds varied from $2,500 to $40,000 for Carter Lake and Siltcoos campgrounds, respectively. Annual capital costs per campsite ranged from $212 for Carter Lake to $736 for West Carter Lake and averaged $345 per campsite for the 15 facilities.

Use of the alternative interest rates has a large impact on annual capital costs. An interest rate of 4 percent results in an annual capital cost of about $175,000 per campground while the 10 percent rate yields a total annual amortized cost of $266,000. Regardless of the interest rate used, the amortized costs represent a large part of the total cost of providing the facilities. Furthermore, they are a fixed cost. Its amount is independent of the level of use of the facilities. However, as the level of use of the facilities increases, the amortized cost per camper unit decreases.

Operation and Maintenance Costs

Operation and maintenance costs are variable costs. They can be avoided by closing the campgrounds. In addition, operation and maintenance costs usually vary directly with the level of use of a facility. However, some of these costs become fixed or semi-fixed once the decision is made to operate the facilities. For example, contracts for garbage collection become a fixed cost after they are negotiated until they are cancelled or terminated. Therefore, some operation and maintenance costs may not be highly responsive to changes in the level of use of a facility, especially if the change in use is relatively small.

Estimates of 1974 operation and maintenance costs were provided by personnel in the various ranger district offices of the Siuslaw National Forest. The estimates are shown in Table 4. Operation and Maintenance costs averaged $8,837 per campground and $213 per campsite. Siltcoos campground had highest total operation and maintenance costs and the highest operation and maintenance

Table 4. Total Operation and Maintenance Costs and Operation and Maintenance Costs per Campsite for the Forest Service Campgrounds on the Oregon Coast, 1974

Campground	Total O & M Costs	O & M Costs Per Campsite
Sand Beach	$ 16,150	$160
Tillicum Beach	16,522	290
Rock Creek	3,478	217
Alder Creek	2,700	123
Dune Lake	3,300	194
Sutton Lake	2,250	75
Sutton Creek	3,750	60
Tyee	3,194	246
Siltcoos	33,598	305
West Carter Lake	5,460	248
Carter Lake	2,780	253
Tahkenitch	10,919	248
Eel Creek	20,216	238
South Eel Creek	3,294	253
Bluebill Lake	4,938	260
Total	$132,549	
Average	$ 8,837	$213

cost per campsite. There are many differences in the type of facilities, the length of the camping season, and the level of use of the individual campgrounds. This makes it impossible to draw conclusions from these data about the relationship between operation and maintenance costs and the size of the campgrounds.

Total Annual Costs

The total annual costs of providing the Forest Service campgrounds in 1974 are reported in Table 5. These costs represent the sum of the 1974 operation and maintenance costs and the 1974 annual amortized capital costs based on an interest rate of 6.875 percent. Total annual costs ranged from $5,000 for Carter Lake Campground to $74,000 for the Siltcoos campground. The average cost

Table 5. Total Annual Costs of Providing the 15 Forest Service Campgrounds on the Oregon Coast, 1974 a/

Campground	Total Annual Costs	Total Annual Costs Per Campsite
Sand Beach	$ 42,625	$422
Tillicum Beach	37,011	649
Rock Creek	11,025	689
Alder Lake	11,751	534
Dune Lake	11,054	650
Sutton Lake	11,752	392
Sutton Creek	22,378	355
Tyee	6,967	536
Siltcoos	74,157	674
West Carter Lake	21,650	984
Carter Lake	5,114	465
Tahkenitch Lake	21,600	491
Eel Creek	48,693	573
South Eel Creek	8,752	673
Bluebill Lake	13,001	684
Total	$347,530	
Average	$ 23,169	$558

a/ Total annual costs represent the sum of operation and maintenance costs and the annual amortized costs, based on an interest rate of 6.875 percent.

for the 15 campgrounds was $23,000. On a per-campsite basis, Sutton Creek had the lowest annual costs ($355) and West Carter Lake had the highest annual costs per campsite of $984. Seven campgrounds had total annual costs per campsite of $600 or more; the average for the 15 campgrounds was $558 per campsite. These costs illustrate that providing of public campgrounds is a costly endeavor. It cost almost $350,000 in 1974 to provide the 15 Forest Service campgrounds.

Cost Per Camper Unit

Total costs and total costs per campsite are useful for illustrating the expenses associated with campground provision. However, to evaluate policy and management alternatives, costs per camper unit[4/] are more important. The average operation and maintenance and average total cost per camper unit are reported in Table 6, along with the estimated number of camper units that used the campgrounds. The cost data in the table also can be interpreted as the average fee required to recover operation and maintenance costs and total annual costs, respectively, given the level of use that occurred in 1974.

Operation and maintenance (O & M) costs per camper unit varied from $1.53 for Sand Beach to $11.64 at West Carter Lake. The average for the 15 campgrounds in 1974 was slightly more than $3 per camper unit. Only three of the campgrounds had O & M costs per camper unit of less than $2. Total costs per camper unit ranged from $3.56 for Tillicum Beach to $46.16 for West Carter Lake. The average for the 15 campgrounds was about $8 even though only five of the 15 campgrounds had a total cost per camper unit below this average.

The campgrounds with the lowest costs per camper unit are not the same campgrounds that had the lowest costs per campsite. For example, Tillicum Beach campground had the second-highest operation and maintenance costs per

4/ A "camper unit" is a camping party that uses a site for one night. If the party stays two nights, it is counted as two camper units. Hence, "camper units" represents the total number of times the campsites in a given campground were utilized. The number of camper units was estimated from the U.S.F.S. visitor days data by dividing the number of visitor days by 3.2. This figure is an estimate of the average number of people in a camping party. This conversion procedure assumes that each person in each party only spent 12 hours in the campgrounds. This assumption was made because a large part of the campers who use these campgrounds are transient. In a destination-type campground the number of visitor days would have to be divided by 6.4 (assuming the same average size of party) because each visitor would account for two visitor days in a 24-hour period.

Table 6. Estimated Number of Camper Units, Average Operation and Maintenance Cost per Camper Unit and Average Total Costs per Camper Unit for the 15 Forest Service Campgrounds on the Oregon Coast, 1974

Campground	Estimated Number of Camper Units in 1974	Average O & M Costs per Camper Unit	Average Total Costs per Camper Unit[a/]
Sand Beach	10,531	$ 1.53	$ 4.05
Tillicum Beach	10,688	1.55	3.46
Rock Creek	2,188	1.59	5.04
Alder Lake	813	3.32	14.45
Dune Lake	594	5.56	18.61
Sutton Lake	1,000	2.25	11.75
Sutton Creek	1,844	2.03	12.14
Tyee	1,438	2.22	4.84
Siltcoos	4,406	7.63	16.83
West Carter Lake	469	11.64	46.16
Carter Lake	313	8.88	16.34
Tahkenitch Lake	2,281	4.79	9.47
Eel Creek	4,281	4.72	11.37
South Eel Creek	375	8.78	23.34
Bluebill Lake	2,094	2.36	6.21
Total	43,315		
Average	2,888	$ 3.06	$ 8.02

[a/] Based on an interest rate of 6.875 percent.

camper unit. In terms of total annual costs, Rock Creek campground had the second-highest costs per campsite and the second-lowest costs per camper unit. This illustrates how the level of use influences the fixed and variable costs per camper unit. Variable costs per camper unit decline as the occupancy rate increases. This is consistent with the observation that some variable costs become "fixed" once the decision is made to operate the campground.

The previous analysis indicates that amortized capital costs account for about 60 percent of the total costs when an interest charge of 6.875 percent is used. In addition, operation and maintenance costs do not increase proportionally with use. In fact, operation and maintenance costs per camper unit

may decline over a wide range of use. These observations suggest several ways to reduce the cost of providing facilities. First, the relationship between campground size and construction costs should be closely analyzed. As noted, some facilities, such as comfort stations, are "lumpy" and expensive facilities. If the size of campgrounds is chosen such that the cost of these items is spread over the maximum number of campsites feasible, the annual amortized capital costs per campsite could be reduced.

The anticipated level of use of future campgrounds also should be carefully considered. A campground that is larger than required will result in higher costs per camper unit because of the fixed nature of many of the costs. On the other hand, campgrounds that are too small result in overcrowding and unsatisfied campers. Hence, information relating to the demand for campsites in a particular area is essential for reducing the costs per camper unit of providing the campground services.

The analysis also suggests a management alternative for existing campgrounds on the Oregon Coast. Significant cost savings may be possible by closing some of the smaller, under-utilized facilities during off-peak demand periods. Since other campgrounds are available nearby, campers should not be seriously inconvenienced by the closures. Furthermore, closing a few of these facilities would accomplish two things. First, the operation and maintenance costs for those facilities could be avoided. Second, since the increased use of the remaining facilities would not result in a proportional increase in operation and maintenance costs, operation and maintenance costs at those facilities would not increase significantly.

Campground Revenues

The year in which the Oregon study was conducted coincided with the period when Congress had revoked the authority of federal agencies to charge

fees at campgrounds. Hence, no revenue was collected from the users of the Forest Service campgrounds in 1974.

A Comparison of Costs and Potential Revenues

In 1975, the Forest Service was given the authority to resume charging fees at its campgrounds. A $3 fee per campsite per night was levied at most of the coastal campgrounds.[5/] We can use this fee to compare potential revenue and costs. The number of camper units was multiplied by $3 to estimate the potential total revenue.[6/] The estimates are shown in Table 7, along with the appropriate cost data and the estimated surpluses and deficits.

The potential total revenue was greater than O & M costs at seven of the 15 campgrounds. The surplus ranged from more than $15,000 at Sand Beach and Tillicum Beach to less than $1,000 at Sutton Lake. On the other hand, O & M costs were greater than potential revenue at eight campgrounds and the deficit was more than $20,000 at Siltcoos. On a per camper unit basis, the surplus/deficit ranged from $1.47 at Sand Beach to -$8.64 at West Carter Lake.

In total, the potential revenue for the 15 campgrounds was just slightly less than O & M costs. The deficit was only $2,604, or about six cents per camper unit. Hence the potential revenue associated with a $3 fee per camper unit would have come very close to covering O & M costs in 1974.

Comparing potential total revenue and total annual costs showed that a deficit was incurred at all 15 campgrounds. The size of the deficit ranged

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5/ The fee charged at a particular campground in 1975 varied in relation to the level of development within the facility. A $3 fee was initiated at most of the Oregon coastal campgrounds because of the relatively high level of development in those campgrounds.

6/ This assumes that the demand curve for the Forest Service campgrounds is perfectly inelastic over the range being analyzed.

Table 7. A Comparison of Costs and Potential Total Revenue from Camping Fees for the Forest Service Campgrounds on the Oregon Coast, 1974

Campground	Comparison of O&M Costs & Potential Total Revenue				Comparison of Total Annual Costs & Potential Total Revenue		
	Potential Total Revenue	O&M Costs	Surplus (+) or Deficit (-)	Surplus (+) or Deficit (-) per Camper Unit	Total Annual Costs	Surplus (+) or Deficit (-)	Surplus (+) or Deficit (-) per Camper Unit
Sand Beach	$ 31,593	$ 16,150	$+15,443	$+1.47	$ 42,625	$ -11,032	$ -1.05
Tillicum	32,064	16,522	+15,542	+1.45	37,011	- 4,947	-0.46
Rock Creek	6,564	3,478	+ 3,086	+1.41	11,025	- 4,461	-2.04
Alder Creek	2,439	2,700	- 261	-0.32	11,751	- 9,312	-11.45
Dune Lake	1,782	3,300	- 1,518	-2.56	11,054	- 9,272	-15.61
Sutton Lake	3,000	2,250	+ 750	+0.75	11,752	- 8,752	- 8.75
Sutton Creek	5,532	3,750	+ 1,782	+0.97	22,378	-16,846	- 9.14
Tyee	4,314	3,194	+ 1,120	+0.78	6,967	- 2,653	- 1.84
Siltcoos	13,218	33,598	-20,380	-4.63	74,157	-60,939	-13.83
W. Carter Lake	1,407	5,460	- 4,053	-8.64	21,650	-20,243	-43.16
Carter Lake	939	2,780	- 1,841	-5.88	5,114	- 4,175	-13.34
Tahkenitch Lake	6,843	10,919	- 4,076	-1.79	21,600	-14,757	- 6.47
Eel Creek	12,843	20,216	- 7,373	-1.72	48,693	-35,850	- 8.37
South Eel Creek	1,125	3,294	- 2,169	-5.78	8,752	- 7,627	-20.34
Bluebill Lake	6,282	4,938	+ 1,344	+0.64	13,001	- 6,719	- 3.21
Total	$129,945	$132,549	$- 2,604		$347,530	$-217,585	
Average	$ 8,664	$ 8,837	$- 173	$-0.06	$ 23,169	$- 14,506	$- 5.02

from more than $60,000 at Siltcoos to less than $3,000 at Tyee. The average deficit per campground was about $14,500. The deficit per camper unit averaged slightly more than $5 and was as high as $43 at West Carter Lake. Six campgrounds had a deficit of more than $10, whereas only four had a deficit of less than $3. In total, annual costs exceeded potential revenue by almost $217,600.

Two important assumptions used to derive the surplus and deficit figures should be remembered. First, it was assumed that each person only accounted for one visitor day per 24 hours because of the transient use of the facilities. Use of the conservative assumption of one visitor day per 24 hours (rather than two visitor days per person) may have resulted in the overestimation of the number of camper units and total revenue. Therefore, the data presented above represent minimum estimates of the hypothetical deficits and maximum estimates of the potential surpluses.

The second assumption results in another bias in the same direction. The use data were gathered during a period in which fees were not charged for use of the facilities. If a $3 fee had actually been in effect in 1974, there presumably would have been a reduction in the number of visitor days and camper units. The assumption that the level of use is not affected by the hypothetical $3 fee also reduces the deficits and increases the surplus. Hence, the surplus and deficit figures reported above represent an optimistic comparison of costs and revenues.

The above comparison of revenue and costs represents a hypothetical situation. In reality, no revenue was collected in 1974. Therefore, the total deficit associated with the provision of the 15 campgrounds in 1974 was close to $350,000. The cost figures clearly illustrate that the provision of campgrounds is not a "free good" even though campground users were able to use them free of charge in 1974.

FOREST SERVICE FACILITIES AT PRIEST LAKE, IDAHO

The Forest Service operates four campgrounds on the western shore of Priest Lake in the panhandle of northern Idaho. The remoteness of the lake necessitates the provision of campgrounds for effective utilization of the lake for recreational purposes. These facilities tend to be used more by destination than transient campers. The campgrounds also are slightly less developed than those on the Oregon coast.

The Costs of Providing Forest Service Campgrounds at Priest Lake

The cost of providing Forest Service campgrounds at Priest Lake were estimated using the procedures described earlier. However, the costs reported below are for 1975 rather than 1974.

Replacement Costs

The 1975 replacement costs were estimated for each of the campgrounds and are reported in Table 8. Replacement costs ranged from $66,600 for Osprey to $107,336 for Luby Bay. The average replacement cost for the four facilities was about $82,500. Luby Bay (the largest campground) had the lowest replacement cost per campsite and Osprey (the smallest campground) had the highest. Again, however, comparisons of replacement costs between campgrounds to determine if economies of size exist are not possible because of the differences in the facilities provided in each campground.

Amortized Replacement Costs

The amortized capital costs for each of the facilities and the three interest rates are reported in Table 9. Based on an interest rate of 6.875 percent, the total annual capital costs for the four campgrounds were about $28,000 or $7,000

Table 8. Estimated Total Replacement Costs per Campground and per Campsite for the Four U.S. Forest Service Campgrounds at Priest Lake, Idaho, 1975

Campground	Number of Campsites	Total Replacement Costs	Replacement Costs per Campsite
Outlet	26	$ 78,712	$3,027
Osprey	17	66,603	3,918
Reeder Bay	23	77,500	3,370
Luby Bay	52	107,336	2,064
Total	118	$330,151	
Average	29.5	$ 82,538	$2,798

Table 9. Annual Amortized Capital Costs per Campground and per Campsite, for Interest Rates of 4, 6.875, and 10 percent, for Forest Service Campgrounds at Priest Lake, Idaho, 1975

	4 percent		6.875 percent		10 Percent	
Campground	Annual Capital Cost	Annual Capital Cost per Campsite	Annual Capital Cost	Annual Capital Cost per Campsite	Annual Capital Cost	Annual Capital Cost per Campsite
Outlet	$ 5,039	$194	$ 6,679	$257	$ 8,672	$334
Osprey	4,263	251	5,652	332	7,338	432
Reeder Bay	4,961	216	6,576	286	8,538	371
Luby Bay	6,871	132	9,108	175	11,825	227
Total	$21,134		$28,015		$36,373	
Average	$ 5,284	$179	$ 7,004	$237	$ 9,093	$308

per campground. Capital costs ranged from $175 per campsite at Luby Bay to $332 per campsite at Osprey and averaged $237 per campsite for the four facilities. Increasing the interest rate from 4 percent to 6.875 percent increases the average annual capital costs per campground by abou: $1,720. An interest rate of 10 percent results in an annual payment of $2,089, more than that obtained with an interest rate of 6.875 percent.

In general, the amortized annual capital costs per campsite for the Idaho campgrounds are lower than those reported for the Oregon campgrounds. For example, the average annual amortized payment for the Idaho facilities was $237 as compared to $345 for the Oregon coastal campgrounds. Much of this difference is because of differences in the level of development chosen because of different climatic conditions in the two localities.

Operation and Maintenance Costs

Operation and maintenance costs for 1975 were estimated by Forest Service personnel in Idaho. The estimates are shown in Table 10. Operation and maintenance costs totaled $32,313 for the four campgrounds and average $8,078. Actual O & M costs ranged from $4,736 at Osprey to $9,744 at Reeder Bay. On a per campsite basis, O & M costs varied from $183 at Luby Bay to $424 at Reeder Bay. The average O & M costs per campsite was $724 in 1975, or about $60 more than the 1974 average O & M costs per campsite for the Oregon coastal campgrounds operated by the Forest Service.

Total Annual Costs

Total annual costs, or the sum of 1975 O & M costs and annual capital costs based on an interest rate of 6.875 percent, are presented in Table 11. Luby Bay campground had the highest total annual costs ($18,551) but the lowest annual total costs on a per-campsite basis ($357). Annual total costs averaged more than $15,000 per campground and $511 per campsite. The latter figure is comparable to the total annual cost of $558 per campsite reported for the Oregon coastal Forest Service campgrounds presented earlier.

As in the earlier analysis, the costs reported above do not include a charge for land. Since the land is in public ownership, and would remain in public ownership regardless of its use in campgrounds, land values would have to be derived from approved alternative federal uses of the land, such

Table 10. Total Operation and Maintenance Costs and Operation and Maintenance Costs per Campsite for the Forest Service Campgrounds at Priest Lake, Idaho, 1975

Campground	Total O & M Costs	O & M Costs per Campsite
Outlet	$ 8,390	$323
Osprey	4,736	279
Reeder Bay	9,744	424
Luby Bay	9,443	182
Total	$32,313	
Average	$ 8,078	$274

Table 11. Total Annual Costs of Providing the Forest Service Campgrounds at Priest Lake, Idaho, 1975

Campground	Total Annual Costs	Total Annual Costs per Campsite
Outlet	$15,069	$590
Osprey	10,388	611
Reeder Bay	16,320	710
Luby Bay	18,551	357
Total	$60,328	
Average	$15,082	$511

as timber production. Land costs derived on this basis would be relatively small in comparison to the other costs considered [Gibbs and van Hees, 1980].

Costs per Camper Unit

As noted earlier, the estimation of costs on a per camper unit basis is useful for analyzing the costs incurred to accommodate a camping part for one night. These costs are shown in Table 12.[6/]

[6/] Again, it was necessary to estimate the number of camper units from the visitor day data provided by the Forest Service. The conversion factor used for the Idaho campgrounds is significantly different from that used for the Oregon campgrounds. The average size of the group was assumed to be four people. In addition, since the Idaho campgrounds are used primarily by destination campers, it was assumed that each visitor accounted for two visitor days in a 24-hour period. Hence, the visitor day figure for each Idaho campground was divided by eight, rather than 3.2 as in the Oregon campground analysis, to estimate the number of camper units.

Table 12. Estimated Number of Camper Units, Average Operation and Maintenance Costs per Camper Unit, and Average Total Costs per Camper Unit for the Forest Service Campgrounds at Priest Lake, Idaho, 1975

Campground	Estimated Number of Camper Units	Average O & M Costs per Camper Unit	Average Total Costs per Camper Unit
Outlet	1,200	$6.99	$12.56
Osprey	600	7.89	17.31
Reeder Bay	3,188	3.06	5.12
Luby Bay	1,763	5.36	10.52
Total	6,751		
Average	1,688	$4.79	$ 8.94

Operation and maintenance costs per camper unit ranged from slightly more than $3 at Reeder Bay to almost $8 at Osprey. The Average O & M costs per camper unit for the four facilities was $4.79. Although the average O & M costs per camper unit for the 15 Forest Service campgrounds in Oregon were lower ($3.06), the estimates for the Idaho Forest Service campgrounds fall within the range determined for the Oregon campgrounds and are generally consistent with them.

Average total costs per camper unit averaged just under $9 and ranged from about $5 to more than $12.50. Once again, these estimates fall within the range determined for the Forest Service facilities studied in Oregon. The estimated average total costs per camper unit for the Idaho facilities are within one dollar of the comparable figure estimated in the Oregon study.

The similarity of the cost estimates in the two studies is encouraging in that it increases the confidence one can place on the data. However, the reader is again advised that different assumptions about the conversion of visitor day data to camper unit data could result in drastic changes in the estimated costs per camper unit. This problem area should be investigated more thoroughly in subsequent studies of this nature.

Campground Revenues

User fees were charged at the four Priest Lake Forest Service campgrounds in 1975. Agency personnel were able to provide some revenue data. Total revenue from user fees was $13,427. Unfortunately, the personnel could not provide a breakdown as to how much of the total revenue was collected at each of the four campgrounds. For this study, the total revenue was allocated among the four campgrounds proportionally to the number of camper units in each facility.

A Comparison of Revenues and Costs

The total revenue data for each campground and the estimated surplus or deficit figures are shown in Table 13. Total revenue per campground ranged from about $1,000 at Osprey to $6,340 at Reeder Bay. The average revenue per campground was $3,357. Total revenue per camper unit is the same ($1.99) for all facilities because of the procedures used to allocate the total revenue among the four campgrounds.

In comparing total revenue and O & M costs, all campgrounds incurred a deficit. That is, O & M costs were greater than total revenue for all four campgrounds. The deficit was greatest at Outlet Campground ($6,003) but averaged more than $4,700 per campground. The deficit per camper unit ranged from $1.07 at Reeder Bay to $5.90 at Osprey Campground. The deficit averaged $2.80 for the four facilities.

The differences between total annual costs and total revenues are, of course, even greater. The total deficit for 1975 was about $46,900, or $11,725 per campground. The deficit per camper unit was $6.95 for the Forest Service campgrounds at Priest Lake.

Table 13. Total Revenue from Camping Fees and Costs for the Forest Service Campgrounds at Priest Lake, Idaho, 1975

Campground	Total Revenue	Total Revenue per Camper Unit	Comparison of Total Revenue and O & M Costs: Surplus (+) or Deficit (-)	Comparison of Total Revenue and O & M Costs: Surplus (+) or Deficit (-) per Camper Unit	Comparison of Total Revenue and Total Annual Costs: Surplus (+) or Deficit (-)	Comparison of Total Revenue and Total Annual Costs: Surplus (+) or Deficit (-) per Camper Unit
Outlet	$ 2,387	$1.99	$- 6,003	$-5.00	$-12,682	$-10.57
Osprey	1,194	1.99	- 3,542	-5.90	- 9,194	-15.32
Reeder Bay	6,340	1.99	- 3,404	-1.07	- 9,980	- 3.13
Luby Bay	3,506	1.99	- 5,937	-3.37	-15,045	- 8.53
Total	$13,427		$-18,886		$-46,901	
Average	$ 3,357	$1.99	$- 4,722	$-2.80	$-11,725	$- 6.95

Again, these figures should be interpreted cautiously but they illustrate that campers are only paying a small part of the total costs associated with providing public campgrounds. Campers paid about $2 per party per night while the estimated total cost of providing the facilities was almost $9 per party per night.

STATE PARK FACILITIES AT PRIEST LAKE, IDAHO

The Idaho Department of Parks and Recreation provides three campgrounds on the eastern shore of Priest Lake. The amount of development among the three campgrounds vaires considerably. The campground of Indian Creek is highly developed with flush toilets, showers, and some sites have complete hookups for sewer, water, and electricity. In contrast, Lionhead and Dickensheet have pit and flush toilets and do not have a developed water system.

The Costs of Providing Idaho State Campgrounds at Priest Lake

Replacement Costs

The 1975 replacement costs for the three state campgrounds at Priest Lake are reported in Table 14. The combined replacement cost for the three facilities was almost $370,000. Indian Creek campground accounted for more than 80 percent of the total replacement cost.

The disparity in replacement costs also is reflected in the replacement costs per campsite. Indian Creek had a replacement cost of more than $4,600 per campsite compared to costs of less than $2,000 per campsite for the other campgrounds. Of course, this disparity is explained by the much higher level of improvement at Indian Creek.

Table 14. Estimated Replacement Cost per Campground and per Campsite for the State Campgrounds at Priest Lake, Idaho, 1975

Campground	Number of Sites	Total Replacement Cost	Replacement Cost per Campsite
Indian Creek	67	$309,125	$4,614
Lionhead	25	42,525	1,701
Dickensheet	10	18,150	1,815
Total	102	$369,800	
Average	34.3	$123,267	$3,625

Amortized Replacement Costs

The annual amortized capital costs are shown in Table 15 for interest rates of 4, 6.875, and 10 percent. Based on an interest rate of 6.875 percent, Indian Creek had an annual capital cost per campsite of almost $400, or more than double the figure for other campgrounds. The average annual capital costs per campground was $10,460 and $308 per campsite.

Operation and Maintenance Costs

The Department of Parks and Recreation provided an estimate of the total operation and maintenance costs for the three campgrounds. It was impossible to break down the total into individual facilities because the campgrounds are administered as a single state park. In addition, the Idaho study concerned itself only with O & M costs incurred during the summer camping season. It was estimated that 25 percent of O & M costs were attributable to winter use; so only 75 percent of O & M costs were used to represent the variable costs associated with summer use of the facilities.

Operation and maintenance costs for the summer of 1975 were estimated to be $43,071 or about $422 per campsite. O & M costs for Indian Creek are probably much higher than for the two other facilities because Indian Creek receives more intensive use and has more improvements.

Table 15. Annual Amortized Capital Cost per Campground and per Campsite, for Interest Rates of 4.0, 6.875, and 10 percnet, for Idaho State Campgrounds at Priest Lake, Idaho, 1975

Campground	Annual Capital Costs; R = 4%		Annual Capital Costs; R = 6.875%		Annual Capital Costs; R = 10%	
	Total	per Campsite	Total	per Campsite	Cost	per Campsite
Indian Creek	$19,788	$295	$26,231	$392	$34,056	$508
Lionhead	2,722	109	3,608	144	4,685	187
Dickensheet	1,162	116	1,540	154	2,000	200
Total	$23,671		$31,379		$40,741	
Average	$ 7,891	$232	$10,460	$308	$13,580	$399

Total Annual Costs

Total annual costs of providing the three facilities can be determined only on a total and average basis because of the lack of a breakdown of O & M costs among campgrounds. Total annual costs in 1975 for the three state campgrounds were $74,454, using an interest rate of 6.875 percent for estimating annual capital costs. Total costs per campsite averaged $730 for the same interest rate.[7/] The total annual costs for the state campgrounds are about $200 higher per campsite than the costs for the Forest Service campgrounds at both Priest Lake and on the Oregon coast. The higher costs reflect the higher level of development at Indian Creek State Campground.

Costs per Camper Unit

The Department of Parks and Recreation in Idaho maintains attendance figures in camper units rather than visitor days. Therefore, no conversion of use data was necessary. The Department indicated that 7,579 camper units utilized the three campgrounds during the summer of 1975. However, the Department personnel were again unable to provide use estimates for the individual campgrounds.

Utilizing averages and an interest rate of 6.875 percent, the average operation and maintenance cost per camper unit was estimated to be $6.58. This estimate is also higher than the comparable costs estimated for both sets of Forest Service facilities studied.

The average annual total costs per camper unit for the campgrounds in 1975 dollars were $9.82, or about one dollar more than the same cost for the Priest Lake Forest Service facilities. Higher attendance at the state campgrounds spread the fixed capital costs over more camper units. Therefore,

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[7/] This cost is based on the average annual cost per campsite of $308.

the difference between total annual costs per camper unit for the Forest Service and state facilities was less than the difference between O & M costs per camper unit.

Campground Revenues

Total revenue from camping fees was provided by Department personnel, but the revenue could not be allocated to individual campgrounds. Total revenue for the three facilities was $13,000 in 1975. This is equivalent to $127 per campsite and $1.72 per camper unit. The actual fees paid by campers at Indian Creek were $2 per night for tent sites and $4 per night for trailer sites. Fees were collected on an irregular basis at the two other campgrounds.

A Comparison of Revenues and Costs

Cost and revenue data are presented in Table 16 for comparison. The difference between total revenue from user fees and O & M costs was slightly more than $30,000 in 1975. Revenue per camper unit was almost $4 less than O & M costs per camper unit. User fees resulted in the recovery of about 30 percent of the O & M costs.

Table 16. A Comparison of Total Revenue from Camping Fees and Costs for the State Campgrounds at Priest Lake, Idaho, 1975

Revenue/Cost	Total	Per Camper Unit
Total Revenue	$ 13,000	$ 1.72
Operation & Maintenance Costs	43,071	5.68
Deficit	$-30,017	$-3.96
Total Revenue	$ 13,000	$ 1.72
Total Annual Costs[a/]	74,454	9.82
Deficit	$-61.454	$-8.10

[a/] Based upon average annual capital costs for the three facilities and an interest rate of 6.875 percent, i.e., annual capital costs of $31,383 were used to calculate total annual costs.

The difference between total revenue and total annual costs was more than twice as large. User fees were more than $61,000 less than total annual costs. User fees only paid about 17.5 percent of the total annual costs. The revenue per camper unit was about $8 less than total annual costs per camper unit.

STATE PARK CAMPGROUNDS ON THE OREGON COAST

The coastal campgrounds provided by the Oregon State Parks and Recreation Division are the most highly developed facilities considered in this report. Almost all of them contain shower facilities, flush toilets, coin-operated laundries, and sites with complete hookups. They are also the most intensively managed campgrounds with gate attendants and a campsite reservation system for the more popular parks. In general, the campgrounds are also larger than the others considered above.

The Costs of Providing State Campgrounds on the Oregon Coast

The costs associated with providing 18 state campgrounds were estimated in a manner which parallels the cost estimates made for the Forest Service campgrounds. The different costs are discussed separately below. Two other points should be noted first, however.

First, the original study of state campgrounds estimated the costs and returns for FY 1973-74. These data have been updated to reflect costs and returns for FY 1977-78. Thus, the data presented in this section are more current. The ease of obtaining the necessary information for updating the analysis made it feasible to do so. It was not considered feasible to update the other analyses because of the difficulty of obtaining the required information.

It should also be noted that two of the state coastal campgrounds were excluded from the analysis. Loeb and Oswald West campgrounds are quite different from the other facilities. For example, Oswald West only provides wilderness sites and Loeb does not contain a utility building. Given the method used to estimate replacement costs, the estimates obtained do not accurately reflect the replacement costs of these facilities. Data for the remaining 16 campgrounds are discussed below and are sufficient to illustrate costs and returns.

Replacement Costs

Instead of inventorying the facilities in each campground and estimating the current replacement cost of each item as was done in the previous analyses, the actual construction costs for four of the newer coastal campgrounds were used to estimate an average replacement cost per campsite for 1974. For the purpose of this report, the 1974 replacement cost per campsite of $4,313 was converted to 1978 dollars through the use of a construction cost index. In 1978 dollars, the replacement cost per campsite is estimated to be $5,779. The 1978 replacement costs for each campground are shown in Table 17.

The replacement costs for the campgrounds are directly proportional to the number of campsites in each campground. Fort Stevens campground has the highest 1978 replacement cost ($3.5 million). The estimated 1978 replacement cost for all 16 facilities is $18 million.

Amortized Replacement Costs

The amortized replacement costs for the 16 state coastal campgrounds are shown in Table 18 for interest rates of 4, 6.875, and 10 percent.

The annual capital costs varied from about $28,000 for Cape Blanco to more than $295,000 for Fort Stevens when an interest rate of 6.875

Table 17. Estimated Replacement Costs for 16 Oregon State Coastal Campgrounds, 1978

Campground	Number of Campsites	Estimated 1978 Replacement Cost
Fort Stevens	603	$ 3,484,737
Nehalem Bay	292	1,687,468
Cape Lookout	246	1,421,634
Devil's Lake	100	577,900
Beverly Beach	278	1,606,562
South Beach	257	1,485,203
Beachside	80	462,370
Carl G. Washburne	60	346,740
Jesse M. Honeyman	382	2,207,578
Umpqua Lighthouse	63	364,077
William M. Tugman	115	664,585
Sunset Bay	137	791,723
Bullards Beach	192	1,109,568
Cape Blanco	58	335,182
Humbug Mountain	101	583,679
Harris Beach	151	872,629
Total	3,115	$18,001,585
Average	195	$ 1,125,099

Table 18. Annual Amortized Capital Costs for 16 Oregon State Coastal Campgrounds Based on 1978 Replacement Costs and Interest Rates of 4 Percent, 6.875 Percent, and 10 Percent

Campground	Annual Amortized Payment		
	4 Percent	6.876 Percent	10 Percent
Fort Stevens	$ 223,065	$ 295,668	$ 383,907
Nehalem Bay	108,018	143,176	185,905
Cape Lookout	91,002	120,621	156,619
Devil's Lake	36,993	49,033	63,666
Beverly Beach	102,839	136,311	176,992
South Beach	95,071	126,014	163,622
Beachside	29,597	39,230	50,938
Carl G. Washburne	22,196	29,420	38,200
Jesse M. Honeyman	141,311	187,305	243,205
Umpqua Lighthouse	23,305	30,891	40,110
William M. Tugman	42,541	56,388	73,216
Bullards Beach	71,026	94,143	122,239
Cape Blanco	21,456	28,439	36,926
Humbug Mountain	37,362	49,523	64,303
Harris Beach	55,859	74,039	96,136
Total	$1,152,321	$1,527,376	$1,983,207
Average	$ 72,020	$ 95,461	$ 123,950

percent is used. In total, annual capital costs were more than $1.5 million when calculated for the 6.875 percent interest rate. Annual capital costs were $1.15 million and almost $2.0 million for interest rates of 4 percent, and 10 percent, respectively. The average capital costs per campground were $72,020, $95,416, and $123,950 for interest rates of 4 percent, 6.875 percent, and 10 percent, respectively.

Fiscal year 1977-78 operation and maintenance costs for the 16 state campgrounds are shown in Table 19. In total, more than $1.6 million was spent to operate and maintain the campgrounds. The costs for individual campgrounds ranged from about $30,000 at Carl G. Washburne to $288,000 at Fort Stevens. The average operation and maintenance cost per campground was $103,553. On a per-campsite basis, Devil's Lake had the highest operation and maintenance cost ($826) and Nehalem Bay had the lowest cost ($305). The average O & M cost for the 16 campgrounds was $532 per campsite.

It is interesting to compare FY 1977-78 O & M costs with the same costs in FY 1973-74. Total operation and maintenance costs for the same 16 campgrounds in FY 1973-74 was $1,061,661 or $340 per campsite. Hence, O & M costs increased 56 percent during the four-year period.

Total Annual Costs

The FY 1977-78 total annual costs of providing the state campgrounds are reported in Table 20. Capital costs based on an interest rate of 6.875 percent were used to estimate total annual costs. The annual cost of providing the 16 state-operated campgrounds was about $3.2 million in 1978. The costs ranged from almost $60,000 for Carl G. Washburne to $583,000 for Fort Stevens. The average total annual cost per campground was about $200,000 and the average total annual cost per campsite was more than $1,000.

Table 19. Total Operation and Maintenance Costs and Operation and Maintenance Costs per Campsite for 16 Oregon State Campgrounds on the Oregon Coast, FY 1977-78

Campgrounds	Total Operation & Maintenance Costs	Operation & Maintenance Costs per Campsite
Fort Stevens	$ 287,559	$477
Nehalem Bay	89,017	305
Cape Lookout	170,327	692
Devil's Lake	82,557	826
Beverly Beach	191,223	688
South Beach	106,316	414
Beachside	43,873	548
Carl G. Washburne	30,423	507
Jesse M. Honeyman	178,717	468
Umpqua Lighthouse	50,972	809
William M. Tugman	39,121	340
Sunset Bay	87,449	638
Bullards Beach	98,854	515
Cape Blanco	32,286	557
Humbug Mountain	51,798	513
Harris Beach	116,355	771
Total	$1,565,847	
Average	$ 103,553	$532

The costs associated with providing the Oregon State Campgrounds are higher than those reported in the previous sections. This is only partially explained by the more current year of analysis. Even when FY 1973-74 data are compared, the state-operated campground costs are still significantly higher. For example, the 1974 replacement cost per campsite for the state facilities was about $1,000 higher than for the Oregon coastal Forest Service campground. Furthermore, operation and maintenance costs per campsite were about $125 higher at the state-operated facilities. These differences

Table 20. Total Annual Costs and Total Annual Costs per Campsite for 16 Oregon State Coastal Campgrounds, FY 1977-78 a/

Campground	Total Annual Costs	Total Annual Costs per Campsite
Fort Stevens	$ 583,227	$ 967
Nehalem Bay	232,193	795
Cape Lookout	290,948	1,083
Devil's Lake	131,590	1,316
Beverly Beach	327,534	1,178
South Beach	232,330	904
Beachside	83,103	1,039
Carl G. Washburne	59,843	997
Jesse M. Honeyman	366,022	958
Umpqua Lighthouse	81,863	1,299
William M. Tugman	95,509	831
Sunset Bay	154,624	1,129
Bullards Beach	192,997	1,005
Cape Blanco	60,725	1,047
Humbug Mountain	101,321	1,003
Harris Beach	190,384	1,261
Total	$3,184,213	
Average	$ 199,013	$1,022

a/ Total annual costs include O & M costs and the annual amortized capital costs based on an interest rate of 6.875 percent.

are explained by the higher level of development, the availability of more services, and the more intensive management practices used in the Oregon state facilities.

Costs per Camper Unit

Like its counterpart in Idaho, the Oregon Parks and Recreation Division maintains attendance figures in camper units. The number of camper units who utilized each campground in FY 1977-78 are reported in Table 21 along with the costs per camper unit. The number of camper units at the various campgrounds

Table 21. Number of Camper Units, Average Operation and Maintenance Costs, and Average Total Costs per Camper Unit for the 16 State Campgrounds on the Oregon Coast, FY 1977-78

Campground	Number of Camper Units	Average O&M Costs per Camper Unit	Average Total Costs per Camper Unit
Fort Stevens	57,299	$5.02	$10.18
Nehalem Bay	16,239	5.48	14.30
Cape Lookout	27,717	6.15	10.50
Devil's Lake	11,205	7.37	11.74
Beverly Beach	24,330	7.86	13.46
South Beach	30,892	3.44	7.52
Beachside	9,946	4.41	8.36
Carl G. Washburne	6,560	4.64	9.12
Jesse M. Honeyman	38,217	4.68	9.58
Umpqua Lighthouse	6,936	7.35	11.80
William M. Tugman	8,879	4.41	10.76
Sunset Bay	15,342	5.70	10.08
Bullards Beach	20,683	4.78	9.33
Cape Blanco	4,182	7.72	14.52
Humbug Mountain	10,202	5.08	9.93
Harris Beach	22,417	5.19	8.49
Total	311,046		
Average	19,440	$5.33	$10.24

ranged from only about 4,000 at Cape Blanco to more than 57,000 at Fort Stevens. Total attendance at the 16 campgrounds was 311,000 camper units in FY 1977-78, compared to 288,000 in FY 1973-74. Attendance in the latter year was about 10 percent below normal, because of the shortage of gasoline during that year.

Operation and maintenance costs per camper unit in 1977-78 averaged $5.33 for the 16 campgrounds and ranged from $3.44 at South Beach to $7.86 at Beverly Beach. O & M costs per camper unit were less than $5 at six campgrounds. In contrast, four campgrounds experienced an O & M cost per camper unit of $7 or more.

Total annual costs per camper unit were highest at Cape Blanco ($14.52). Two other facilities, Nehalem Bay and Beverly Beach, also had annual total costs of more than $12 per camper unit. Seven of the 16 campgrounds had annual total costs per camper unit of less than $10. The average total cost per camper unit for the 16 facilities was $10.24, or about double the average O & M costs per camper unit.

Campground Revenues

The basic camping fee at state campgrounds in FY 1977-78 ranged from $2 per night for primitive sites to $5 for trailer sites with all hookups. In addition, the state charged additional fees for certain services. For example, an "add-on" fee is levied for extra vehicles, reservations, and group camping. In addition, non-resident camping parties are charged a non-resident surcharge of $2 per night.

Revenue data for the state operated campgrounds are reported in Table 22. Total revenue from the basic camping fees was about $1.2 million and the "add-on" fees resulted in the collection of an additional $452,000. The "add-on" fees accounted for almost 28 percent of the total revenue collected. The non-resident surcharge, reservation fees and deposits, and the extra vehicle fee accounted for most of the "add-on" revenue.

Total revenue varied from $21,000 at Cape Blanco to $312,000 at Fort Stevens. However, on a per campsite basis, Harris Beach was the largest producer of revenue, yielding $788 per campsite. Total revenue per campsite averaged $525 for the 16 facilities.

Revenue per camper unit ranged from $4.84 at Cape Blanco to $5.86 at Carl G. Washburne. The average "add-on" fee paid per camper unit was $1.45 ($451,967 ÷ 311,046). This illustrates the importance of these fees in the revenue structure of the Oregon Parks and Recreation Division.

Table 22. Revenue Data for the 16 Oregon State Campgrounds on the Oregon Coast, FY 1977-78

Campground	Revenue from Camping Fees	Revenue from other Sources	Total Revenue	Total Revenue per Campsite	Total Revenue per Camper Unit
Fort Stevens	$ 223,849	$ 88,520	$ 312,369	$518	$5.45
Nehalem Bay	60,099	23,122	83,221	285	5.12
Cape Lookout	98,689	44,981	143,670	584	5.18
Devil's Lake	39,966	16,055	56,021	560	5.00
Beverly Beach	100,787	34,749	135,536	488	5.57
South Beach	117,587	35,124	152,711	594	4.94
Beachside	29,817	13,434	43,251	541	4.35
Carl G. Washburne	32,365	6,108	38,473	641	5.86
Jesse M. Honeyman	136,369	67,810	204,179	535	5.34
Umpqua Lighthouse	26,659	7,776	34,435	547	4.96
William M. Tugman	36,510	7,375	43,885	382	4.94
Sunset Bay	50,258	28,314	78,572	574	5.12
Bullards Beach	91,706	27,169	118,875	619	5.75
Cape Blanco	16,226	4,933	21,159	365	5.06
Humbug Mountain	36,826	12,541	49,367	489	4.84
Harris Beach	85,084	33,956	119,040	788	5.31
Total	$1,182,797	$451,967	$1,634,764		
Average	$ 73,925	$ 28,248	$ 102,172	$525	$5.26

A Comparison of Revenues and Costs

Fiscal year 1977-78 revenue and costs for the 16 coastal campgrounds operated by the Oregon Parks and Recreation Division are compared in Table 23. The data indicate that total revenue was almost equal to O & M costs. The deficit between O & M costs and revenue was only $22,000, or seven cents per camper unit. Revenue was greater than O & M costs at seven of the facilities. The largest surplus ($46,395) occurred at South Beach while the largest deficit ($55,687) occurred at Beverly Beach. Beverly Beach was

Table 23. A Comparison of Total Revenue from User Fees and Costs for the 16 State Campgrounds on the Oregon Coast, FY 1977-78

Campground	Comparison of O & M Costs & Potential Total Revenue		Comparison of Total Annual Costs & Potential Total Revenue	
	Surplus (+) or Deficit (-)	Surplus (+) or Deficit (-) per Camper Unit	Surplus (+) or Deficit (-)	Surplus (+) or Deficit (-) per Camper Unit
Fort Stevens	$+24,810	$+0.43	$ -270,858	$-4.73
Nehalem Bay	- 5,796	-0.36	-148,972	-9.17
Cape Lookout	-26,657	-0.96	-147,278	-5.31
Devil's Lake	-26,536	-2.37	- 75,569	-6.74
Beverly Beach	-55,687	-2.29	-191,998	-7.89
South Beach	+46,395	+1.50	- 79,619	-2.58
Beachside	- 622	-0.06	- 39,852	-4.01
Carl G. Washburne	+ 8,050	+1.23	- 21,370	-3.26
Jesse M. Honeyman	+25,462	+0.67	-161,843	-4.23
Umpqua Lighthouse	-16,537	-2.38	- 47,428	-6.84
William M. Tugman	+ 4,764	+0.54	- 51,624	-5.81
Sunset Bay	- 8,877	-0.58	- 76,052	-4.96
Bullards Beach	+20,021	+0.97	- 74,122	-3.58
Cape Blanco	-11,127	-2.66	- 39,566	-9.46
Humbug Mountain	- 2,431	-0.24	- 51,954	-5.09
Harris Beach	+ 2,685	+0.12	- 71,344	-3.18
Total	$-22,083		$-1,549,449	
Average	$- 1,380	-0.07	$ - 96,841	$-4.98

closed during part of the camping season so revenue was below normal for that facility. If it had been open for the entire season, the Parks and Recreation Division might have been successful in achieving its goal of recovering all O & M costs from revenue collected from users of the facilities. In FY 1973-74, the revenue collected at the same campgrounds was $305,579 less than O & M costs.

The Parks and Recreation Division has increased fees in the past to keep pace with increasing O & M costs. The increases and the development of "add-on" fees have increased revenues through the years. A relatively new add-on fee, the non-resident surcharge, was initiated in FY 1976-77 to help defray the O & M deficit and allow out-of-state campers to pay a larger share of the costs. It has been argued that this fee is justified because state residents contribute to the cost of providing facilities through other taxes that are not paid by non-residents. For example, license fees for campers and recreational vehicles registered in Oregon are earmarked for the State Parks and Recreation programs. Since non-residents do not pay these fees, the surcharge was initiated to help equalize the cost borne by resident and non-resident campers.

The comparison of revenue and total costs shows that revenue was $1.55 million less than total annual costs. The deficit per campground was about $97,000 or $5 per camper unit. These figures are consistent with those reported above in that they indicate that users fees only cover about one-half of the costs of providing the facilities.

BIBLIOGRAPHY

Baumol, William J., 1968. "On the Social Rate of Discount," American Economic Review, 78:788-802.

Gibbs, Kenneth C. and Willem W.S. van Hees, 1980. "A Cost Analysis of U.S. Forest Service Campgrounds in the Pacific Northwest," Forest Research Laboratory Research Bulletin No. 30, Oregon State University, Corvallis.

Haveman, Robert H., 1968. "The Opportunity Cost of Displaced Private Spending and the Social Discount Rate," Water Resources and Economic Development of the West, Report No. 17 (Conference Proceedings of the Committee on the Economics of Water Resources Development of the Western Agricultural Economics Research Council, Denver, Colorado, December 17-18), pp. 51-70.

Hanke, Steve H., Philip H. Carver, and Paul Bugg. "Project Evaluation during Inflation," Water Resources Research, Vol. 11, No. 4, August 1975, pp. 511-514.

Howe, Charles W., 1971. Benefit-Cost Analysis for Water System Planning, Water Resources Monography No. 2, American Geophysical Union, Washington, D.C.

Marglin, Stephen A., 1963. "The Social Rate of Discount and the Optimal Rate of Investment," Quarterly Journal of Economics, 77:95-112.

Parks and Recreation Division, 1978. Oregon State Parks System Plan, 1979-85, Department of Transportation, State of Oregon, Salem.

Reiling, Stephen D., 1976. An Economic Analysis of Policies, Costs and Returns for Public Campgrounds on the Oregon Coast, Unpublished Ph.D. Thesis, Oregon State University, Corvallis, 239 numb. leaves.

Reiling, Stephen D., and Herbert H. Stoevener, 1977. "Commercial Campgrounds on the Oregon Coast: Characteristics and Financial Status," Agricultural Experiment Station Circular of Information 659, Corvallis.

White, William B., 1977. An Economic Evaluation of the Costs and Benefits of the Provision of Developed Campgrounds Along Priest Lake, Idaho, Unpublished M.S. Thesis, University of Idaho, Moscow, 100 numb. leaves.

Appendix Table 1. A Summary of Cost and Revenue Data for Oregon and Idaho Public Campgrounds

Type of Cost/Revenue	Forest Service Coastal Campgrounds (1974)	Forest Service Priest Lake Campgrounds (1975)	Idaho Priest Lake Campgrounds (1975)	Oregon State Coastal Campgrounds (1978)
A. Replacement Costs				
1. per campground	$141,445	$82,538	$123,267	$1,125,099
2. per campsite	3,406	2,798	3,625	5,779
3. per camper unit	48.98	48.90	48.79	57.87
B. Amortized Replacement Costs[a/]				
1. per campground	14,332	7,004	10,460	95,461
2. per campsite	345	237	308	490
3. per camper unit	4.96	4.15	4.14	4.91
C. Operation & Maintenance Costs				
1. per campground	8,837	8,078	14,357	103,553
2. per campsite	213	274	422	532
3. per camper unit	3.06	4.79	5.68	5.33
D. Total Annual Costs[b/]				
1. per campground	23,169	15,082	24,818	109,013
2. per campsite	558	511	730	1,022
3. per camper unit	8.02	8.94	9.82	10.24
E. Revenue from Users Fees				
1. per campground	0[c/]	3,357	4,333	102,172
2. per campsite	0	114	127	525
3. per camper unit	0	1.99	1.72	5.26

[a/] Based on an interest rate of 6.875%.

[b/] Total annual costs are the sums of amortized replacement costs and O&M costs.

[c/] Congressional action prohibited the collection of user fees at Forest Service campgrounds in 1974.