# VISITOR USE IN THE KETTLE FALLS AREA OF LAKE ROOSEVELT NATIONAL RECREATION AREA

Report Prepared for the National Park Service

Troy Hall Andrew Bentley

Department of Conservation Social Sciences University of Idaho Moscow, ID 83844-1139

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### INTRODUCTION

This report by the Conservation Social Sciences Department at the University of Idaho (UI), is part of project to develop a tool to assess public need for recreational access at the Kettle Falls area of Lake Roosevelt National Recreation Area (LARO). This report, along with the other components of our project, will help managers define public need for recreation sites at LARO by identifying current visitor use distribution and trends.

During the summer of 2010, UI researchers performed systematic vehicle and visitor counts at 17 selected LARO recreation sites in the vicinity of Kettle Falls, WA (see Table 1). These sites were selected in consultation with LARO managers and include both developed and undeveloped sites. Developed sites are accessible to vehicles with trailers, but several of the dispersed sites are not. Additionally, developed sites have facilities not found at dispersed sites, including tables, toilets, and/or boat ramps. Generally, the dispersed sites have much smaller capacities and less available beach, although there are exceptions (for instance, at certain lake levels, Lion's Island and Rickey Point have extensive sandy beaches).

Data were collected during four observation periods, each lasting nine days. One Saturday per month (May, June, July, and August) was randomly selected as the starting day, so that each period included two weekends and the five intervening weekdays. UI researchers visited each site twice per day, rotating in a consistent sequence from north to south. To decrease potential bias in the data, the starting location was randomly selected each day (see Appendix A for example schedule). In this report, we provide summary data on use levels, exploring differences by season, time of day, and weather conditions. Additionally, we provide remarks based on field notes from observations of visitor behavior, informal conversations with visitors and managers, and observations about the amount of useable beach at different lake levels. The lake level was at a low of 1260' in May, stayed at approximately 1288' in June and July, and dropped slightly to 1282' in August.

The researcher counted vehicles and visitors by systematically moving through each study site, documenting use in each distinct portion of the site (e.g., each parking lot, boat ramps, and shoreline). Consistent boundaries to the north and south of each access point were established during preliminary site visits to ensure that data were collected in a repeatable manner. In this report, data are aggregated for all use areas within each site. Boats were counted if they were moored at the shore or within nearby vicinity (i.e., speaking distance). Boats out on the water were not counted, nor were trailered boats in parking lots. We counted vehicles and trailers separately, so these data should be considered together to understand the demand on parking capacity.

Table 1. LARO recreation sites where visitor use data were collected in 2010

#### Sites

- 1. Evans Day Use boat ramp area, including ramp, parking, and immediate shore; day use area, including parking, designated swim area, shoreline 50 yards south and 50 yards north to the courtesy dock.
- 2. Summer Island boats moored at shore or in close vicinity of Summer Island were observed from a vantage point on Highway 25, one mile south of Evans day use area.
- 3. Marcus Island Day Use developed day use area, including parking, boat ramp, swim area, and shoreline visible from the parking area.
- 4. Pingston Creek Area parking and shoreline use associated with three pullouts along Highway 25 near Pingston Creek. These sites were added after the May observation session.
- 5. Leonard's Launch use of the undeveloped spur access road and shoreline.
- 6. T-pullout use of the undeveloped spur access road and shoreline.
- 7. Harter's Landing –use of the undeveloped spur roads and shoreline.
- 8. Kettle Falls Marina boat ramp area, including ramp, fuel dock, parking lots north and south of the ramp, entrance road shoulders, and shoreline immediately north of the boat ramp. We did not include motorboats and houseboats moored at the concessionaire slips or leased moorage.
- 9. Lion's Island use at the end of the undeveloped access road and along the shore stretching for 75 yards to south and 25 yards to the north. Locust Grove group campsite and adjacent parking/turnaround area are not included.
- 10. Sherman Creek shoreline use of the beach (boats & people) at Sherman Creek was observed from Lion's Island.
- 11. Swim Beach parking lot, grassy play area, pavilions, playground equipment, developed swim area. Visitors not visible from the grassy area (e.g., west of the day area, along undeveloped paths) were not included.
- 12. Colville River parking and shoreline use south of the Highway 25 bridge, extending approximately 100 yards up and down river (area visible from the bridge and parking area).
- 13. Colville Flats parking area and shoreline use at Colville Flats and extending 150 yards south of the parking area.
- 14. Ski Point use of Ski Point shoreline (boats & people) was observed from Colville Flats. Counts of vehicles at the developed parking area were included after May.
- 15. Rickey Point Parking along the undeveloped access road and shoreline north and south of the parking area, including in front of the summer cabins. Use of the sailboat marina area was not included.
- 16. Barryman's Pump use of the undeveloped access spur road and shoreline extending 200 yards north and 100 yards south of Barryman's Pump.
- 17. Bradbury Beach three parking areas, boat ramp, developed swim area, and undeveloped shoreline use 100 yards north and 100 yards south of the boat ramp.

## **Use Patterns by Season**

Use was clearly lower in May than during the rest of the summer (Figures 1 to 7). July had the highest visitation in terms of people at one time (Figures 1 and 2), although the most boats at one time were observed in August (Figures 3 and 4). Among the developed sites, Bradbury had the most people present, probably due to the attractive swimming area and extensive beach available. Rickey Point, despite the lack of signage from the highway and not being visible from the road, had the most people at one time among the dispersed sites. Several of the sites, including Leonard's Launch, the T-pullout, and Barryman's Pump, are all quite small, which may account for their low overall visitation.

Not surprisingly, Kettle Falls Marina had the most motorboats (including houseboats) present at any given time (Figure 3). The boat ramps at Evans and Marcus were not usable in May, which accounts for the lack of boats seen during that time. The shoreline at Rickey Point and Sherman Creek, in front of the cabins, had several boats (including paddle craft and inflatables) present much of the summer (Figure 4). These boats generally appeared to belong to cabin occupants. In Figure 3, the "bay" refers to Welty Bay, where boats were sometimes observed moored at beaches that are not accessible by roads.

Kettle Falls Marina had more than 70 vehicles and approximately 40 boat trailers at any given time from June through August (Figures 5 and 6). During June and July, the north parking lot was observed to be full 11% of the time (6% in August), and traffic flow in the lot was sometimes impaired (33% of the time in June, 22% in July, and 11% in August). On the other hand, the southern parking lot at Kettle Falls Marina was never completely full, and traffic was rarely impeded. The three parking lots at Bradbury Beach were full approximately 11% of the time in June and July, and approximately 6% of the time in August. Traffic flow was impaired approximately 10% of the time at Bradbury Beach, except during May. Available parking at the Evans boat ramp was somewhat cramped, and traffic flow was sometimes impaired (17% of the time in June, 22% in July, and 11% in August). Parking at Colville Flats day use area approached capacity approximately 11% of the time in July and 6% of the time in August, although there were always at least a few parking spaces available.

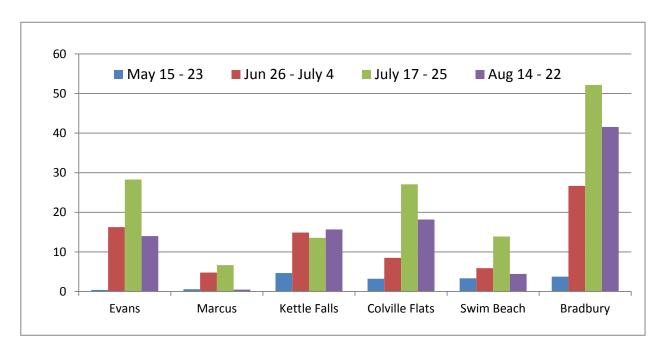


Figure 1. Mean Number of People at One Time at Developed Sites, by Season

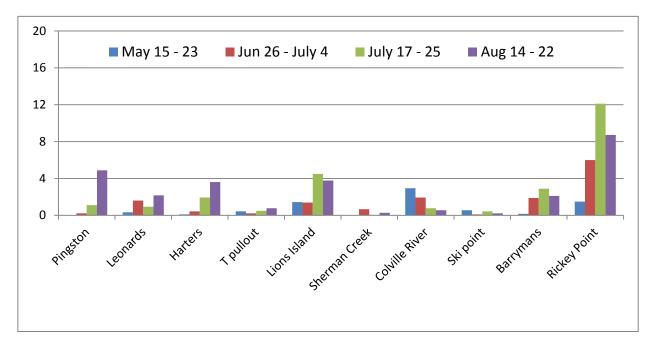


Figure 2. Mean Number of People at One Time at Dispersed Sites, by Season

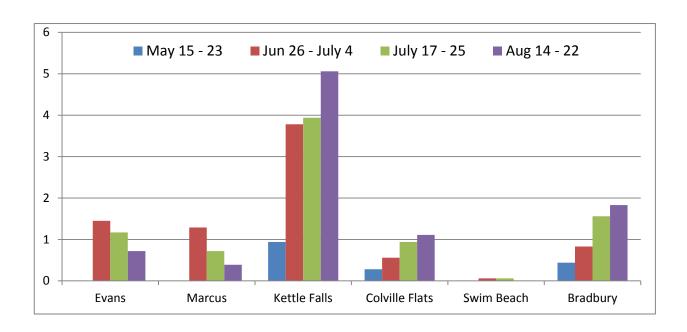


Figure 3. Mean Number of Boats in Vicinity or Moored on Shore at One Time at Developed Sites, by Season

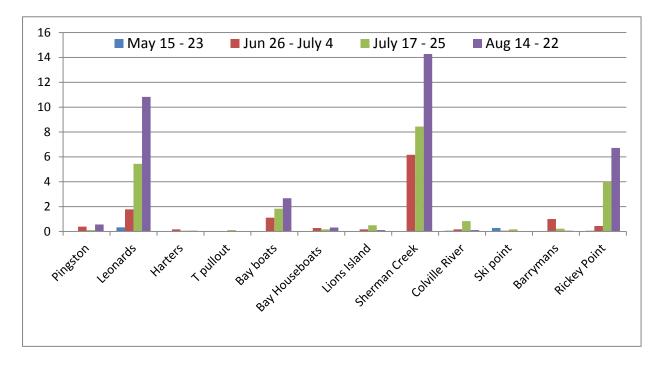


Figure 4. Mean Number of Boats in Vicinity or Moored on Shore at One Time at Dispersed Sites, by Season

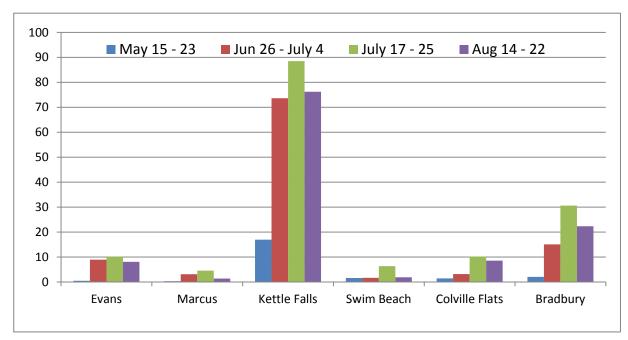


Figure 5. Mean Number of Passenger Vehicles at One Time at Developed Sites, by Season

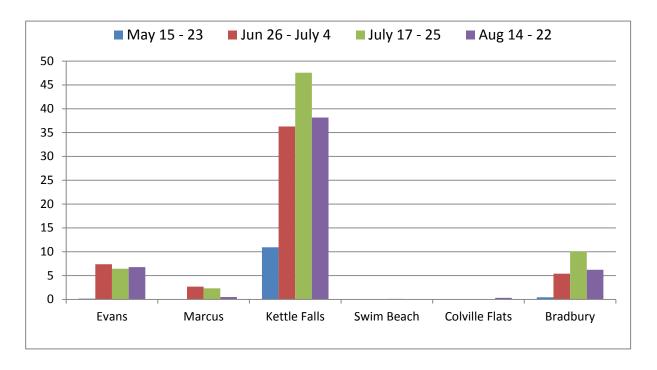


Figure 6. Mean Number of Boat Trailers at One Time at Developed Sites, by Season

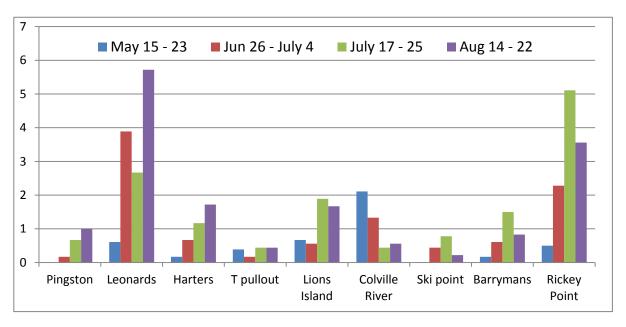


Figure 7. Mean Number of Passenger Vehicles at One Time at Dispersed Sites, by Season

## **Use Patterns by Time of Day**

Before noon, use was very light at all sites (Figures 8 to 14). For instance, at developed sites, the mean number of people at one time was less than 10 in the morning, typically less than one-third of the afternoon visitation (Figures 8 and 9). Interestingly, at some sites, the number of people was larger from 4:00 onward (observations typically stopped by 6:00 p.m.) than between noon and 4:00.

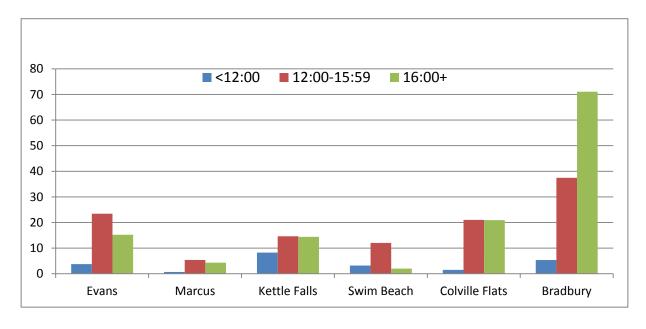


Figure 8. Mean Number of People at One Time at Developed Sites, by Time of Day

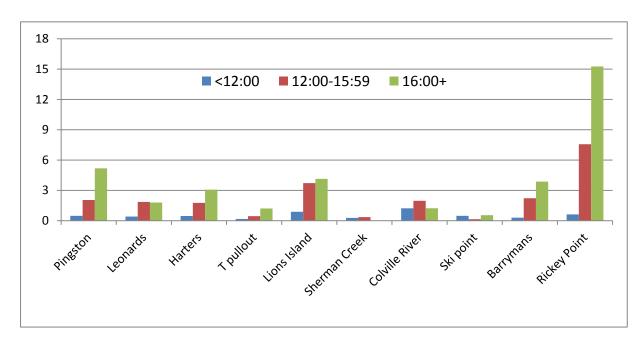


Figure 9. Mean Number of People at One Time at Dispersed Sites, by Time of Day

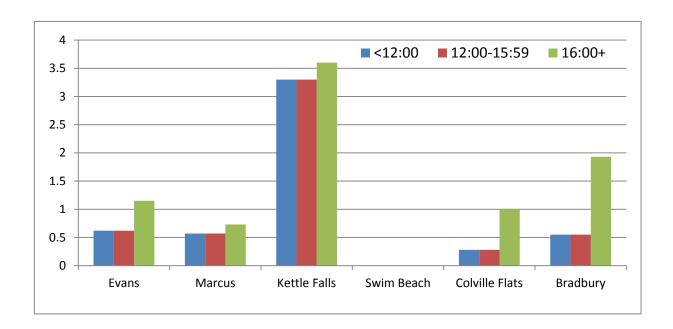


Figure 10. Mean Number of Boats in Vicinity or Moored on Shore at One Time at Developed Sites, by Time of Day

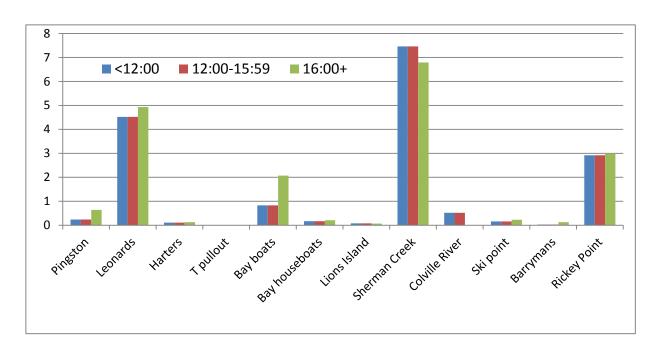


Figure 11. Mean Number of Boats in Vicinity or Moored on Shore at One Time at Dispersed Sites, by Time of Day

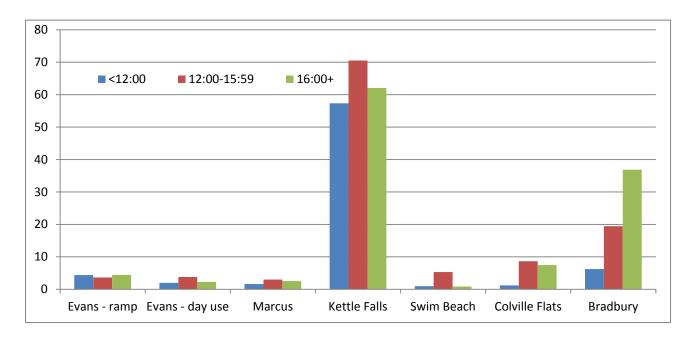


Figure 12. Mean Number of Passenger Vehicles at One Time at Developed Sites, by Time of Day

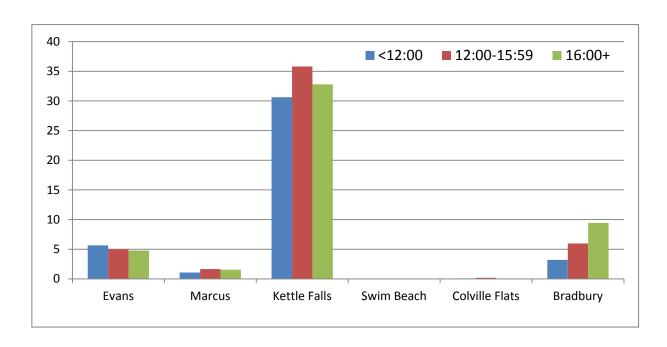


Figure 13. Mean Number of Boat Trailers at One Time at Developed Sites, by Time of Day

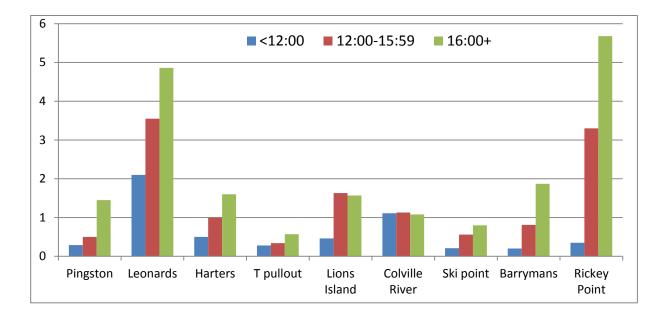


Figure 14. Mean Number of Passenger Vehicles at One Time at Dispersed Sites, by Time of Day

## **Effects of Weather on Visitation**

Temperatures during observation periods ranged from a low of approximately 45 degrees F to a high of just above 100 degrees, with generally cool temperatures in the early morning throughout the summer. Figures 15 to 18 show use levels by temperature range, while Figures 19 to 22 indicate how use differed during overcast versus sunny periods. The number of people present was very low when temperatures were in the 60s. Spikes in use when temperatures were warm (80s) were most notable at the day use areas, especially Evans, Colville Flats, Bradbury, Lions Island, and Rickey Point. A similar pattern was observed between cloudy and sunny days, which is not surprising, as temperatures and cloud cover are obviously related.

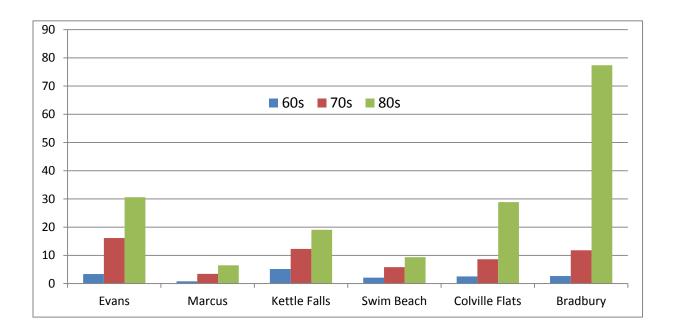


Figure 15. Mean Number of People at One Time at Developed Sites, by Temperature

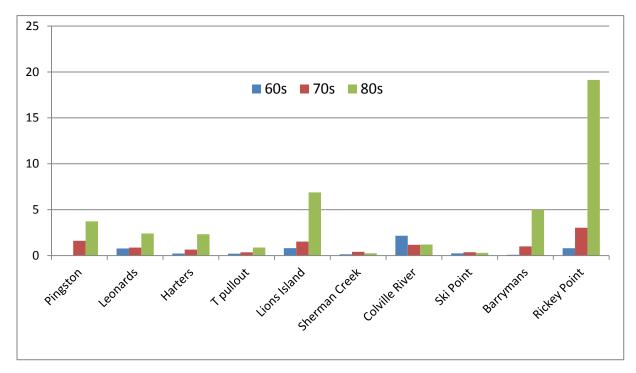


Figure 16. Mean Number of People at One Time at Dispersed Sites, by Temperature

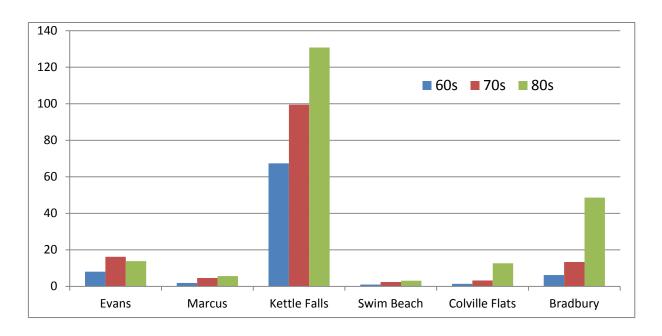


Figure 17. Mean Number of Vehicles and Boat Trailers at One Time at Developed Sites, by Temperature

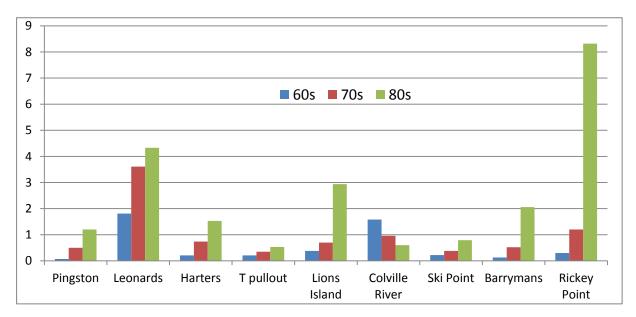


Figure 18. Mean Number of Vehicles and Boat Trailers at One Time at Dispersed Sites, by Temperature

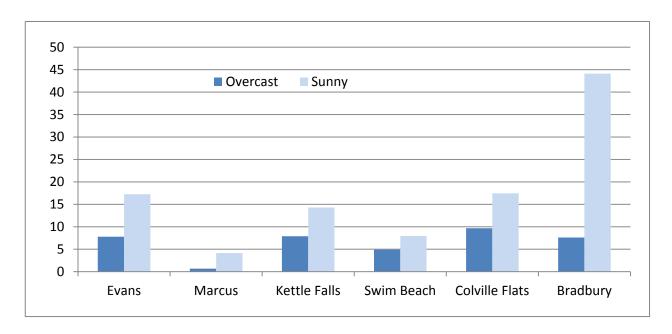


Figure 19. Mean Number of People at One Time at Developed Sites, by Weather Conditions

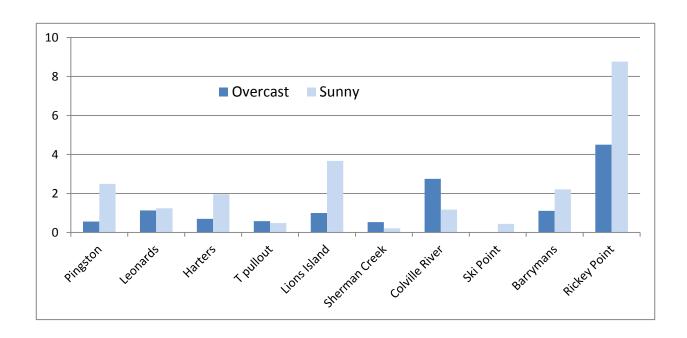


Figure 20. Mean Number of People at One Time at Dispersed Sites, by Weather Conditions

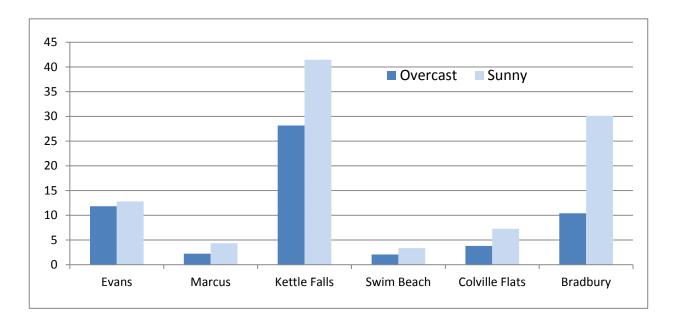


Figure 21. Mean Number of Vehicles and Boat Trailers at One Time at Developed Sites, by Weather Conditions

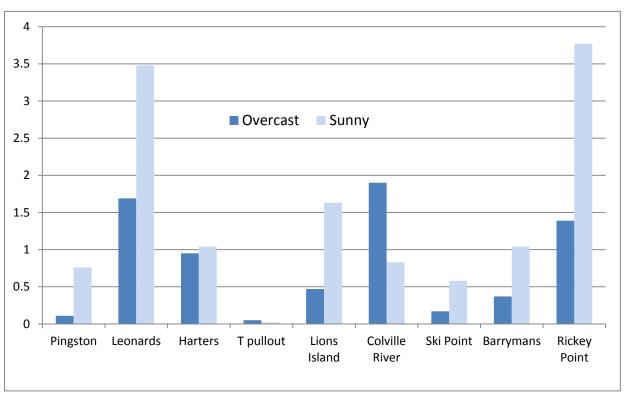


Figure 22. Mean Number of Vehicles and Boat Trailers at One Time at Dispersed Sites, by Weather Conditions

## **Peak Summer Use**

It can be useful to managers to understand peak use levels. As evident from results illustrated above, at LARO, these times are summer afternoons. The total number of people present at dispersed sites between noon and 4:00 p.m. is shown in Figure 23, while the total number of people present at developed sites is shown in Figure 24. The total number of vehicles and boat trailers are shown in Figures 25 and 26. It is important to bear in mind that these data are based on only 10 observations, so they could be influenced by particular conditions or events on the weekend days sampled.

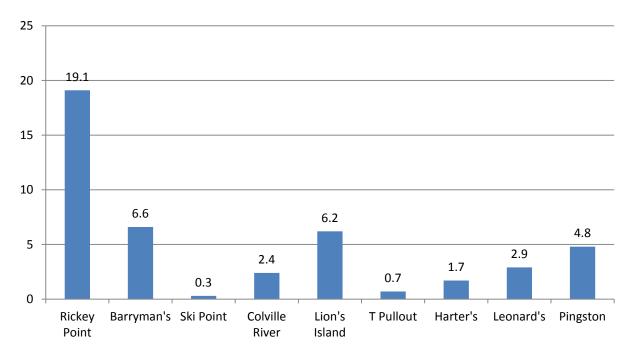


Figure 23. Mean Number of People Present at One Time at Dispersed Sites between 12:00 and 4:00 on July and August Afternoons

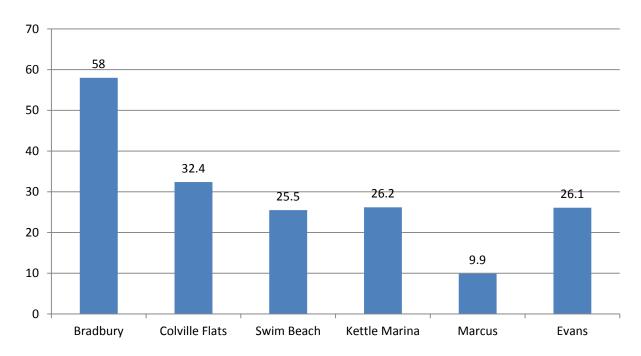


Figure 24. Mean Number of People Present at One Time at Developed Sites between 12:00 and 4:00 on July and August Afternoons

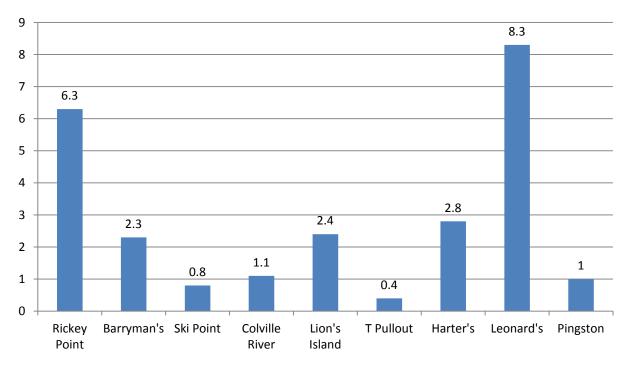


Figure 25. Mean Number of Vehicles and Trailers Present at One Time at Dispersed Sites between 12:00 and 4:00 on July and August Afternoons

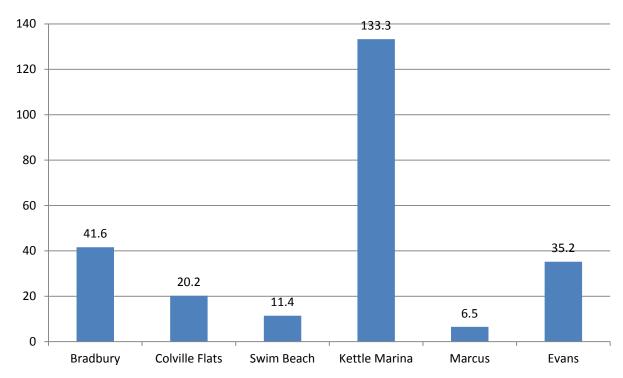


Figure 26. Mean Number of Vehicles and Trailers Present at One Time at Developed Sites between 12:00 and 4:00 on July and August Afternoons

## **Specific Observations for Individual Sites**

## Evans Day Use Area

- It appears that the boat ramp parking capacity is adequate during midweek non-holiday periods. On some weekends and holiday periods, however, the parking lot was typically near capacity, with disorderly overflow parking occurring in an adjacent, unmarked forested area. At very busy times, the single lane of the one-way boat ramp entry loop was used as a parking space, forcing vehicles with trailers to navigate through the overflow area among vehicles and trailers haphazardly parked among large trees. The boat ramp was in use even when the adjacent dock was unusable at lower lake levels, although this required visitors to be creative in tending to their boat once it was free from the trailer and often resulted in people wading out in the water.
- The day use swim area and parking lot were typically under capacity. The exception to this occurred when organized groups used the picnic/pavilion shelter (e.g., a High School reunion party, a Hewes-craft staff party, etc.). Swimming was popular at high lake levels, and swimmers were able to safely jump off the platform. As the lake level drops, water appears to become more stagnant and less visually appealing, and the capacity in terms of area is quickly reduced, although the usable beach area increases. Visitors continued swimming even when public health notices were posted at one point regarding swimmers who had contracted cases of cercarial dermatitis (swimmer's itch). The swim platform begins to bottom out as the lake level drops to 1280'.
- The courtesy dock for campers was in use every day that water levels permitted it to be usable, across weekends and weekdays. This may imply demand for additional courtesy dock space.

#### Summer Island

• The number of boats present at Summer Island was counted using binoculars from a vantage point on Highway 25. Boats were often moored overnight in June and July at the Summer Island campsite. Also, boats appeared moored overnight along the shore north of Summer Island during the course of observations.

#### Marcus Island Day Use Area

• Parking in the lot adjacent to the swim area was generally always available, even on busy weekends. The use of the boat ramp seems partly a function of the available water in the inlet that leads out to the lake. Only a short drop in lake constricts this inlet and eliminates the opportunity for swimming at this location. The swim platform is located in a very shallow area and quickly runs aground with only a few-foot drawdown of the reservoir. Whenever lake level permitted passage through the shallow inlet, campground visitors typically moored watercraft on the shore of the campground across from the Marcus boat ramp.

#### Pingston Creek pullouts

• Of the three pullouts adjacent to the main roadway, the pullout furthest south receives the most visitation (though at most two vehicles at one time were present here). It appeared groups arriving by vehicle use this site to meet others with boats, as groups were often clustered around one or two boats that were tied to shore, and there were more people present than what a boat could safely carry. The amount of available beach here is directly dependent on lake level. As the lake approaches 1288', virtually no open shoreline exists in these areas, and there is no other nearby flat, clear place to reasonably enjoy the lakeshore. However, at lower lake levels, (e.g., 1283' and lower), there is a considerable amount of usable beach in the area and visitors can be seen walking and sitting in these areas.

#### Leonard's Launch

- This site was occupied by houseboats from the same party at some point every month from May through August. In both July and August, this party occupied the same stretch of lakeshore for the entire 9-day observation periods, and for almost half of the observation period in June. Although the number of boats in this party varied, the section of shore occupied by these boats was obviously "claimed" with outdoor furniture (table and chairs) and numerous inflatable tubes left on the beach in front of houseboats for days at a time. Only once during all observational periods was there another party docked in the vicinity, and that was only for one night. It appears this portion of beach is unavailable to other interested parties, since it is routinely if not always occupied by the same party.
- It only took one poorly parked vehicle to block the roadway at Leonard's Launch, and although seldom, when it did occur, backing uphill and around a tight corner was nearly the only option available. Even though vehicles along this roadway were typically parked out of the roadway, for larger vehicles or when parking occured along both sides, passage was severely limited (e.g., an emergency vehicle such as an ambulance could not pass). At the end of this roadway is a rutted turnaround area where vehicles were observed having driven directly onto the lakeshore. Day use visitors also use the end of this roadway to access the shoreline for swimming.
- This particular beach appears desirable to some groups, because houseboats can be moored along the undeveloped lakeshore (even at high lake levels) and there is also vehicle access. It was learned through informal conversation with visitors who were moving items between boats and vehicles that they were area locals. However, not all groups appear to desire vehicle access, as houseboats were periodically observed moored to the other side of Welty Bay across from Leonard's Launch, and also at Summer Island, where there is no vehicle access.
- The shoreline around Welty Bay is relatively shallow. A short drop in lake level can produce a rather large and desirable sandy swimming beach all along the bay. Day use

visitors were occasionally seen swimming just east of where houseboats moor at Leonard's Launch, at beach accessed via a short unmaintained roadway (South Leonard's). Vehicle tracks were also observed illegally accessing the beach when lake levels permitted. When levels are high, the available lake shore for recreation purposes diminishes.

## T-pullout

• This site is often unoccupied and is a fairly private place to pull a vehicle off the roadway. Visitors were observed here sleeping in their vehicle, eating lunch, reading, and having sexual relations. Also this site typically has litter present. Researchers removed at least one full bag of trash from this site during each observation period. Access to the lake at all levels here requires negotiating a steep embankment, and at high lake levels, the shoreline is rocky. At lower levels, there is a large sandy beach extending in both directions.

## Harter's Landing

- Surprisingly little use occurs at this site considering its expansive size (several acres). The lakeshore here is steep and rocky at all levels, except in one place in the center of the site. This central location appears to a popular lunch spot, with occasional motorboat and houseboat use.
- The unmaintained roadway into this area is the most rugged of all the recreation sites visited and requires first crossing over railroad tracks, then proceeding down a steep, loose, and gullied road surface. Even so, all sorts of vehicles were observed here, including motorcycles, passenger cars, minivans, pickups, and even a large utility truck.
- Variations in lake level do not reveal any significant beach area in this site unless lake levels are very low, i.e., 1260'. However, there is a very small and very private beach located at the very north end of the site that requires a steep walk down from the parking area. Only occasionally were cars parked near the user trail to this site.

#### Kettle Falls Marina

• While visitors using the fish cleaning station were not recorded separately, informal observation suggests this station is in daily use. Several single-vehicle spaces are located directly in front of the cleaning station, and when these spaces were empty, vehicles with trailers parked directly across them as anglers cleaned fish, preventing their use by passenger vehicles. Occasionally, even when passenger vehicles were parked in these spaces, anglers effectively blocked them in, by temporarily parking their vehicles with trailers directly in front of these spaces. This tended to impede the overall traffic flow. The public might be well served by designating and (enforcing) spaces near the cleaning station specifically for vehicles with trailers (this could be directly east of the station along the entrance roadway).

- Even though there were some very busy weekends at the Marina, parking never appeared at capacity if one considers the overall number of parking spaces in both the north lot (closest to the campground) and south lot (closest to the leased moorage). The north lot was more easily impeded than the south lot, as various length vehicles with trailers can extend beyond the end of parking spaces on either side of the parking lot passageway. The parking needed during fishing tournaments would likely have been well beyond capacity if off-site parking near the Locust Grove group campsite was not utilized.
- One reason the parking lots were not at capacity was the number of vehicles parked along the entrance roadway. Vehicles with trailers parked along this roadway during every observation period, from May through August. Although a mix of vehicles with trailers of varying length used this area to park, many vehicle-trailer combinations appeared too large to reasonably fit the length of the existing parking spaces designated for vehicles with trailers, because of their large turning radius. These vehicles could not safely navigate getting in or out of the parking spaces when the parking areas were near capacity. Considering that there were almost always available vehicle and trailer spaces in the southern parking area, there may perhaps be something about being able to park along the shoulder that is appealing to visitors (e.g., ease of locating a parking spot, ease of maneuvering into the space, lower likelihood of accidently hitting or scraping another vehicle). Either way, this may become a problem as some visitors choose to bring boats or vehicles that appear much larger than the design specifications of the parking lot layouts. Pull-through spaces that require minimal maneuvering would likely be popular but might require expanding existing parking lots to create the needed exit space to accommodate such a change. Continued documentation of the number of vehicles parking along the shoulder of the marina drive might be a good indicator of the severity of this problem.
- Visitors use the small sand beach area just north of the north parking lot, adjacent to the
  campground, as an informal swimming area. Visitors to the campground also moor their
  boats to shore here. The number of boats and people using this particular portion of the
  larger marina could be tracked to determine if a swim platform and/or campground
  courtesy dock is warranted.
- Most of the time, there was no delay to launch a boat at the Kettle Falls Marina boat ramp. When a queue did develop, wait times were generally less than ten minutes. On more than one occasion, visitors were seen and overheard offering assistance to others at the ramp (e.g., trouble backing up vehicle, needing assistance with carrying items on the dock), that would likely help move the launch cycle along faster. Wait times at the beginning and end of organized fishing tournaments might be longer than ten minutes, as one tournament can easily draw 50 or more boats. This is more likely to be noticed by other visitors at the end of the tournament, because the early start time falls hours before most morning use at the boat ramp. Experienced tournament anglers tend to be very

quick on the ramp, so even though there is some congestion during tournaments, it does not last long.

#### Lion's Island

- Visitors use this site at all lake levels. When the lake is at its highest, water almost reaches the dirt roadway and visitors' choice of places to spread out along the shore is limited. They tend to sit in chairs or vehicles close to the lakeshore edge, at times occupying a portion of the unmaintained roadway. At lower lake levels, visitors use the expansive, although moderately steep, beach for both relaxing and swimming. This area becomes very buggy when the lake level is high and floods the surrounding shallow area.
- The parking area can become somewhat crowded on both weekday and weekend afternoons, as spacing of vehicles is completely at the visitors' whim, but usually there is ample parking. There is little to prevent visitors from increasing the primary area of impact, as there are no vehicle barriers in this area. Occasionally traffic is impeded here due to oddly parked vehicles.
- The same groups of visitors were observed repeatedly over the course of the summer at Lion's Island. Thus, visitors seem to be a mix of locals and users from the Locust Grove group campground.

#### Sherman Creek

Observations of shoreline use at Sherman Creek were made using binoculars from the beach at Lion's Island. At low lake levels in May, there is as extensive exposed shoreline. After May, however, beaches shrank considerably or even disappeared in front of the cabins. The number of boats counted at Sherman Creek included paddle craft and inflatable tubes; for the majority of the summer, between 4 and 17 boats were moored to or on shore at all times of observation. Presumably these were the property of cabin occupants, as often the same craft were recognized at the same location on multiple occurrences. Also, it was not uncommon to see six or seven craft in front of the southernmost cabin.

#### Swim Beach

- While a number of sites in the Kettle Falls area seem to have a problem with mosquitoes, the Swim Beach can be severely infested. Even so, a surprising number of visitors persisted in using the swim area despite the intensity of insects. During one observation period, a visitor wearing protective clothing and facemask was observed fumigating the area. Later that day, a large party was using the shelter. At other times, however, this park was completely empty.
- Although strict counts were not maintained of use of the adjacent softball fields, it stands out as a clear memory when visitors used the fields for a ball game, because this was observed only once the entire summer. In other words, the ball fields were underutilized

- during all the observational periods. Typically, any visitors using these fields were throwing a ball to their dogs. Perhaps this site receives more use by organized groups during the school year.
- Parking at this site was always under capacity, even on weekends when other places were busy. Falling lake levels quickly turn the swimming area into a stagnant and unattractive pool.

#### Ski Point

• Use at Ski Point was very light. The times of highest use were during NPS Interpretive programs with Ranger-led canoe trips that launched from this site. Even so, plenty of vehicle parking was always available. At low water levels, the shoreline moves several hundred feet away from the parking area and there is a usable beach.

#### Colville River

• This roadside pullout on Highway 25 was most popular when lake levels were very low in May and rapids were exposed. A long beach is available to anglers at low lake levels, and several people at a time sometimes congregated in this location. Once lake levels rose, however, use dwindled as the rapids became covered by the reservoir and the shoreline eventually became only a sliver at the foot of a very steep slope. There are several very steep user trails that anglers use to access the shore here all summer. Building a well defined trail here would likely be helpful to anglers.

#### Colville Flats

- Colville Flats is a very popular day use site that is occasionally used for (illegal) overnight use. Vast sand beaches exist when the lake level is low, and a reasonable amount of beach is still available when the lake level is only a few feet from capacity at 1290'. Visitors are typically spread far apart when beach space allows, and are more concentrated when levels are high and beach availability decreases. The density of visitors could be calculated (e.g., via GIS) by determining the ratio of available beach area at certain lake levels to the number of visitors using this area.
- Vehicles were almost always present here from mid-day until early evening, on both weekdays and weekends. Numerous organized parties/picnics took place on the Colville Flats shoreline, including a very large wedding reception expecting 100 guests. Passenger cars were frequent here, along with motorhomes and an occasional church bus. EZ-up shelters, sunshades, umbrellas, and chairs were often present on the beach. Visitors often launched canoes and kayaks, and it was also common to see a motorboat beached at a party of visitors, or various visitors going for boat rides, tubing, or waterskiing in association with beach activity.

- Since parking can occur along the shoulder of the entrance drive for several hundred feet, there was to some degree always parking available. Even though, at busy times, parking may not be near the usable beach, the walk is not far.
- Some of the areas between the beach and the parking area are actually depressed below the lake level, when levels are high. This creates very soft grassy places that become muddy with visitor use. One of these areas is at the edge of the parking area, and an unsuspecting vehicle could possibly become stuck in this soft ground. Also, with varying lake levels, some small scale slumping of the shoreline occurs near a corner of the parking area. It appears that, without stabilization, this may result in a portion of the parking area collapsing or perhaps destabilize the current vehicle barriers separating the beach from the parking area.
- Two porta-potties and trash cans are located on-site, so it appears these needs have been accommodated adequately. The beach was usually remarkably clean, especially considering the large visitor numbers this area receives.
- Although the site appears to attract diverse visitors, on a number of occasions the same vehicles were recognized in the parking lot. Similarly, the same boats were also recognized more than once, suggesting that this site may be important for local residents.

## Rickey Point

- This undeveloped area was the most popular dispersed recreation site observed during this study. Visitors use this area at all lake levels; however, there is minimal beach when lake levels are high. With a drop of only a few feet, visitors are free to disperse across a wider expanse of beach. Vehicles are typically parked at the edge of the transition between the unmaintained roadway and the lakeshore. Vehicle stereos are sometimes used to play music by visitors who sit in nearby chairs. One group of local visitors told the UI researcher they come to Rickey Point when the lake is high because their other preferred lake recreation sites lack enough flat ground for beach chairs when water levels were high. Another visitor volunteered that it was his first visit to LARO and that he was just looking for an easy way to access the shore.
- Numerous informal observations of trash were noted at Rickey Point, and several bags of
  trash were collected by the UI researcher. Trash was dispersed along the length of the
  unmaintained roadways and along the beach. It was also noted, however, that trash would
  periodically be cleaned up, and informal conversations with visitors suggested that some
  went out of their way to collect trash, even bringing trash bags with them to clean up
  trash they had noticed on past visits.
- The undeveloped area is adjacent to the privately owned Rickey Point cabins. During the latter half of the summer, private boats were moored in front of some cabins for the entire period. Beach equipment such as chairs and a large volleyball net persisted for weeks at a time on the public shoreline. Informal conversations with a small number of visitors (<

- 10) at the undeveloped area of Rickey Point suggested they were unaware that the sandy shoreline in front of cabins is public property.
- Many visitors to this area were repeat visitors. The same vehicles were recognized here and at the roadside pullout for the rope swing on more than one occasion. Some visitors volunteered that they were locals and their comments suggest an emotional attachment to this particular location. For example, one said that he loves Rickey Point and has enjoyed the beach for years. Another commented that when the lake level is down ten or more feet from full pool, the undeveloped area at Rickey Point is the most easily accessed and best sand beach around. The most moving comment was from a visitor who mentioned that she had buried her son's ashes at the 1290' line at his request prior to being killed in action serving with the United States military in Iraq.
- At the south end of the undeveloped Rickey Point access road, beyond the cabins, there is an informal parking area and two user footpaths leading away from the road. There were no occurrences of people or vehicles using this lot.

### Barryman's Pump/Pumphouse Road

- The availability of usable shoreline at Barryman's Pump is highly dependent on the lake level. At high lake levels, there is little usable beach, but at lower levels a sand/gravel beach extends for several hundred yards in either direction, although visitors appear to keep within close proximity of the parking area. On average, fewer than one vehicle was present at this site at any given time over the course of the summer.
- Conditions at Barryman's Pump raise two concerns relating to public safety. In 2010, the structure housing the water pump was missing one wall. The pump and supporting electrical connections were easily susceptible to vandalism, especially given the high level of privacy this site affords. Second, and perhaps more importantly, is the mass wasting (slumping) of the cliffs adjacent to a portion of the entrance roadway. The embankment along this roadway is undercut in places, including an unsupported portion under the road shoulder. During the observation period the single remaining tree on the cliff side of the roadway collapsed down the cliff. As high lake levels saturate soils at the base of these cliffs, it is not unreasonable to expect this roadway will at some point wash out. If this were to occur while a party was on the beach, vehicles could become trapped at the end of the roadway. Or, if visitors were using the beach below the cliffs when high lake levels restrict the available beach here and cause them to spread out further along the narrow strip of shore, they could be seriously injured. It also seems possible that a vehicle could cause the roadway to collapse. The roadbed foundation should be inspected and, if necessary, steps taken to prevent a possible accident.

### **Bradbury Beach**

 Bradbury Beach contains a popular boat ramp and the most heavily used swim area among the study sites. However, unlike many of the other areas studied, this area is popular regardless of water levels, as the swim area and boat ramp are accessible at varying lake levels. During summer weekends, the three parking lots here can sometimes reach capacity, with vehicles parking along the shoulder at both the north parking lot and the boat ramp lot. The number of vehicles parked along the shoulder at any of these lots could be used as an indicator of public need for additional access or facilities.

- Since the boat ramp parking area contains only spaces for vehicles with trailers, when a
  vehicle without a trailer parks in this area, it necessarily occupies a space intended for a
  vehicle with a trailer. Additional vehicle-only spaces could be added on the east side of
  the parking lot, or shoulders could be widened to permit overflow parking that does not
  impede traffic.
- Boat traffic was heavy at Bradbury Beach during fishing tournaments based at Kettle Falls Marina.

## CONCLUSIONS

Each of the study sites included in the study area appears to have its own patterns and intensity of use. Capacity in many of these sites seems limited by either availability of parking and/or access to usable beach, though parking areas are rarely full. Usable beach is a function of varying lake levels in this area of the reservoir, with little beach available anywhere at full pool. This may make it more difficult to find open beach without crowding other visitors. Visitors with boats, however, are more able to find usable beach as they are not confined to existing roadways for beach access. When lake levels are lower, due to the underlying geology, ample sand or gravel beaches are available at all sites except Harter's Landing, Kettle Falls Marina, and Colville River.

The data collected during 2010 provide useful insight into management issues at developed and dispersed sites in the Kettle Falls area, as discussed above. They also provide some direction for developing a tool to assess public need for additional recreational access. For instance, given the highly uneven use density across the day, it would make sense to monitor demand during peak times of day, which are between 2:00 and 6:00 p.m. It may also be possible to identify key indicators of demand – such as the number of vehicles parked along road shoulders – which could quickly and effectively document use without requiring laborious counting of vehicles or people. The relatively high level of use of the Rickey Point beach, in contrast to the other dispersed sites in the study, suggests a need to survey visitors at that site to explore their reasons for selecting that site for recreation. These and other implications of the data are explored further in other elements of our research project.

## Appendix A. Sample Observation Schedule

# Example Observation Schedule with Randomized Start (w/o replacement) used for August 14-22, 2010

TIME	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN
830	Colville Flats	Harters	Lions Is	Break	Swim Beach	return drive	Mrcs/Ping	Barryman's	Evans
845	Ricky Point	Kettle Marina	Swim Beach	Break	Colville River	return drive	Leos/TP	Bradbury	Mrcs/Ping
900	Barryman's	Kettle Marina	Colville River	Lions Is	Colville Flats	return drive	Harters	Bradbury	Leos/TP
915	Bradbury	Break	Colville Flats	Swim Beach	Ricky Point	Evans	Kettle Marina	return drive	Harters
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930	Bradbury	Break	Ricky Point	Colville River	Barryman's	Mrcs/Ping	Kettle Marina	return drive	Kettle Marina
945	return drive	Lions Is	Barryman's	Colville Flats	Bradbury	Leos/TP	Break	return drive	Kettle Marina
1000	return drive	Swim Beach	Bradbury	Ricky Point	Bradbury	Harters	Break	Evans	Break
1015	return drive	Colville River	Bradbury	Barryman's	return drive	Kettle Marina	Lions Is	Mrcs/Ping	Break
1030	Evans	Colville Flats	return drive	Bradbury	return drive	Kettle Marina	Swim Beach	Leos/TP	Lions Is
1045	Mrcs/Ping	Ricky Point	return drive	Bradbury	return drive	Break	Colville River	Harters	Swim Beach
1100	Leos/TP	Barryman's	return drive	return drive	Evans	Break	Colville Flats	Kettle Marina	Colville River
1115	Harters	Bradbury	Evans	return drive	Mrcs/Ping	Lions Is	Ricky Point	Kettle Marina	Colville Flats
1130	Kettle Marina	Bradbury	Mrcs/Ping	return drive	Leos/TP	Swim Beach	Barryman's	Break	Ricky Point
1145	Kettle Marina	return drive	Leos/TP	Evans	Harters	Colville River	Bradbury	Break	Barryman's
1200	Break	return drive	Harters	Mrcs/Ping	Kettle Marina	Colville Flats	Bradbury	Lions Is	Bradbury
1215	Break	return drive	Kettle Marina	Leos/TP	Kettle Marina	Ricky Point	return drive	Swim Beach	Bradbury
1230	Lions Is	Evans	Kettle Marina	Harters	Break	Barryman's	return drive	Colville River	return drive
1245	Swim Beach	Mrcs/Ping	Break	Kettle Marina	Break	Bradbury	return drive	Colville Flats	return drive
100	Colville River	Leos/TP	Break	Kettle Marina	Lions Is	Bradbury	Evans	Ricky Point	return drive
115	Colville Flats	Harters	Lions Is	Break	Swim Beach	return drive	Mrcs/Ping	Barryman's	Evans
130	Ricky Point	Kettle Marina	Swim Beach	Break	Colville River	return drive	Leos/TP	Bradbury	Mrcs/Ping
145	Barryman's	Kettle Marina	Colville River	Lions Is	Colville Flats	return drive	Harters	Bradbury	Leos/TP
200	Bradbury	Break	Colville Flats	Swim Beach	Ricky Point	Evans	Kettle Marina	return drive	Harters
215	Bradbury	Break	Ricky Point	Colville River	Barryman's	Mrcs/Ping	Kettle Marina	return drive	Kettle Marina
230	return drive	Lions Is	Barryman's	Colville Flats	Bradbury	Leos/TP	Break	return drive	Kettle Marina
245	return drive	Swim Beach	Bradbury	Ricky Point	Bradbury	Harters	Break	Evans	Break
300	return drive	Colville River	Bradbury	Barryman's	return drive	Kettle Marina	Lions Is	Mrcs/Ping	Break
315	Evans	Colville Flats	return drive	Bradbury	return drive	Kettle Marina	Swim Beach	Leos/TP	Lions Is
330	Mrcs/Ping	Ricky Point	return drive	Bradbury	return drive	Break	Colville River	Harters	Swim Beach
345	Leos/TP	Barryman's	return drive	return drive	Evans	Break	Colville Flats	Kettle Marina	Colville River
400	Harters	Bradbury	Evans	return drive	Mrcs/Ping	Lions Is	Ricky Point	Kettle Marina	Colville Flats
415	Kettle Marina	Bradbury	Mrcs/Ping	return drive	Leos/TP	Swim Beach	Barryman's	Break	Ricky Point
430	Kettle Marina	return drive	Leos/TP	Evans	Harters	Colville River	Bradbury	Break	Barryman's
445	Break	return drive	Harters	Mrcs/Ping	Kettle Marina	Colville Flats	Bradbury	Lions Is	Bradbury
500	Break	return drive	Kettle Marina	Leos/TP	Kettle Marina	Ricky Point	return drive	Swim Beach	Bradbury
515	Lions Is	Evans	Kettle Marina	Harters	Break	Barryman's	return drive	Colville River	return drive
530	Swim Beach	Mrcs/Ping	Break	Kettle Marina	Break	Bradbury	return drive	Colville Flats	return drive
						•			
545	Colville River	Leos/TP	Break	Kettle Marina	Lions Is	Bradbury	Evans	Ricky Point	return drive