

## Personal Floatation Device Use within Interior Alaska.

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Drowning is the #1 cause of unintentional injury death within the Alaska Native population and the #2 cause of unintentional injury death for all races in Alaska<sup>1</sup>. Within Interior Alaska, there is a section of the Yukon River with a very high rate of drowning: The all-races drowning rate from Stevens Village to Galena is 140 per 100,000.<sup>2</sup> There are five villages located along this section of the Yukon River. For these 5 villages, the drowning death rate is an incredible 75 times the national drowning rate and nearly 10 times the drowning rate for Alaska.

These rates are even more alarming when you consider the majority of the drownings (92 percent) occur during a five month period from May to September. Nearly all (99 percent) of the known causes of drowning fatalities in this region occur in natural bodies of water. The majority of these drownings are associated with boating (50 percent).<sup>3</sup> The other leading causes include unknown (26 percent), swimming (10 percent), falling into the water (8 percent), and falling through the ice (4 percent).

One reason the drowning rates are so high is the geographic location of the villages. Each village is located on the banks of a river, and the river is used extensively for transportation. Rivers are the highways of Interior Alaska and nearly all of the villages in the interior are accessible only by air or water. Few of the villages have automobiles, but nearly everyone owns or has access to a boat. Because there are no roads into the villages, the residents use boats as their major form of summer transportation as well as for subsistence activities.

Subsistence practices are an active part of the village lifestyle. They play an important part in the traditional culture as well as the economy. Many of the residents rely on the food they obtain through subsistence activities to survive. When they do travel by boat it is associated with more than just recreation. They are either hunting, fishing, trapping or scouting for good areas to find game.

The risk for drowning in Alaska is greatest among males ages 20-40 years old.<sup>1</sup> This is also the age group that appears to be most active in subsistence activities. Nearly all the boats used in this area are 16- to 18-foot open motorboats. This type of vessel is involved in the majority of drowning fatalities associated with boating<sup>3</sup>. Severe Alaskan weather conditions also increase the risk of drowning. While it's probable that alcohol use by the operator also increases the risk, accurate data on the frequency of alcohol use in Alaska is not yet available. Alcohol, as with all of these risk factors, is a contributing factor and not the sole cause of the drowning.

In addition to identifying the risks, steps should be taken to address the modifications that could reduce the drowning rates. Legislative actions aimed at reducing the rates have been ineffective in this region, because most of the villages have no local enforcement agency. One of the most effective and cost efficient preventative measures available is using a Personal Floatation Device (PFD). An approved and properly worn PFD substantially reduces the risk of drowning. Tanana Chiefs Conference (TCC), a large tribal consortium of 43 Interior Alaskan Tribes, has identified drowning as an area of concern and has realized the importance of wearing a PFD to reduce risk. In cooperation with the Alaska Area Injury Prevention Program, TCC established a "Float Coat" program to address the problem. The program is set up so that village residents can order PFDs from the tribal corporation at wholesale cost. The corporation also pays for shipping the PFDs to the village. The current program was established in 1988. This program is not the only source of PFDs within the village, but it does allow the villagers to purchase a quality PFD at a reasonable cost.

The purpose of this project was to evaluate the prevalence of Personal Floatation Device (PFD) use within Interior Alaska along the Yukon River from Stevens Village to Galena. These five villages were chosen because they are known to have a high drowning rate. It was also possible to collect direct observational data for these five villages.

### METHODS

The study area is divided into five geographic regions according to village. The regions include Stevens Village, Rampart, Tanana, Ruby, and Galena. The study population included all Alaskans living along and using the Yukon River in Interior Alaska, from Stevens Village to Galena. This is a distance of approximately 300 river miles, and includes a population of 1420.<sup>4</sup> Alaska Natives make up 85 percent of the population in these villages.<sup>5</sup> Three methods were used to gather data. First, direct observation was used to obtain actual usage rates. Second, a mail out survey was used to gather information on PFD ownership and use. Additional information asked in the mailed survey included the amount of time spent on the river, as well as the percentage of time spent in subsistence or work

related activities. Third, the TCC's floatcoat program was evaluated to determine the total number of PFDs sold in each village.

**Observational Data.** PFD usage rates were collected by direct visual observation from a boat and from shore. The survey teams consisted of four individuals. Two individuals surveyed the two regions on the upper part of the river and the other two individuals surveyed the three lower regions of the river. Observations took place in June and July of 1993 and 1994. During the summer months, this area of Alaska receives nearly 24 hours of daylight. The observation period included 26 days of observations, and accumulated over 400 hours of direct observational data. Observation times averaged more than 15 hours a day with a range of 12-20 hours per day. This amount of observation was possible because 80 to 90% of the observers' activities took place on or near the river. The only period of the day not consistently covered was from 11:00 PM to 6:00 AM. If the observers were unable to determine if an individual was wearing a PFD, it was recorded as undetermined and not included in the data. If an individual was known to be a repeat observation, it was recorded and marked as a repeat. All repeat data was included in the final rates because among the repeat observations, PFD use was not consistent. To compensate for this the results are expressed as usage rates.

A "passenger" was defined as anyone completely in a boat when the boat is not attached to the shoreline by rope or other docking device. A PFD is classified by type as defined by the US Coast Guard. The type III PFDs category is divided into two subcategories, vests and floatcoats. "Wearing a PFD" was defined as wearing the PFD as recommended by the manufacturer and by the US Coast Guard. Inflatable PFDs are not Coast Guard approved and are not included in the observational data.

**Mail out Survey.** The list of households surveyed was obtained via the Department of Community and Regional Affairs Community Database. The total number of households in the five villages was 435. Each village post office was contacted to determine the total number of P.O. Box holders and general delivery addresses which totaled 555. There are no mail carriers in these villages so all mail must be picked up at the post office. A survey packet was sent to each of the 555 general delivery addresses and P.O. box holders. Even though some households would receive duplicate packets, this procedure ensured that each of the 435 households received at least one packet. A mail survey was chosen because it would access the greatest number of people and it fit within the time constraints and budget limitations of the project.

Each packet included two identical survey forms and a postage paid envelope to return the surveys. To motivate participation and increase the response rate the survey forms were presented as part of a drawing for a free life jacket. In order to enter the drawing the respondent had to answer eight questions. Duplication of surveys was prevented by requiring a name and address on the entry form.

The mail out questionnaire was comprised of eight closed-ended /fixed-choice questions as well as general information on name, age, location, and gender. The survey was developed with help from local and area individuals involved in injury prevention. A pilot test of the survey was made during the summer of 1994. The survey questions assessed the respondent's use of life jackets, including the type of life jacket owned, the location of purchase, and how often they wore their PFD. Other survey items were the amount of time spent on the river per week and the amount of that time related to work or subsistence activities.

**PFD Program Evaluation.** The Tanana Chiefs Conference's floatcoat sales program was evaluated to determine the total number of PFDs sold within the five villages from that program. All existing records from 1990 to 1994 relating to PFD sales were reviewed. The records included purchase orders, shipping receipts and invoices, and copies of canceled checks, as well as any correspondence between the villagers and the corporation. The actual numbers of PFDs sold to the villagers were counted from the shipping invoices and recorded by the shipment date to the village.

This was found to be the most accurate way to count the total number of PFDs received in the village from the PFD program. The villages were also contacted to obtain additional information on how the program was working in the village.

## RESULTS

**Observational results.** A total of 490 passengers were observed during the 26 days of observation in June and July of 1993 and 1994. Out of the 490 passengers, 268 wore some type of PFD. This results in an overall average of 54.7 percent with a village range of from 31 percent to 70 percent. Of the passengers who were wearing PFDs, 91 percent were wearing type III vests, 5 percent were wearing type II vests, and 4 percent were wearing type III floatcoats.

**Mail survey results.** A total of 125 packets were completed and returned (representing 29 percent of the households). A total of 213 surveys were returned in the packets. Of the 213 surveys returned, 208 were complete and appropriate for analysis (representing 15 percent of the total survey population). The mean age of respondents was 38 years, with an 80-year range from 3 to 83 years. Fifty-three percent of the sample was male and 47 percent female. The average self-reported usage rate for PFDs was 89 percent. The 208 respondents owned a total of 157 PFDs (75 percent) and had owned them for an average of 3.5 years. Of those reporting owning a PFD, 69 percent owned a vest style PFDs, 12 percent owned Floatcoat style PFDs, and 3 percent owned inflatable type PFDs. A total of 16 percent owned more than one type of PFD. The average price paid for a vest was \$36.06, and the average price paid for a floatcoat was \$57.65. Of the respondents who owned PFDs, 42 percent bought their PFD from an out-of-town store (except in Tanana where they bought most of their PFDs from the TCC sponsored program), 18 percent bought their PFD from Mail order companies, 14 percent bought from the TCC program, 13 percent received their PFD as a gift, 9 percent bought their PFDs from the local store, and 4 percent obtained their PFDs from other sources.

Other significant questions asked in the survey included the amount of time spent per week boating, and how much of that time was related to subsistence type activities. The average time spent per week on the river was 17.51 hours. The range was from 0 to 40+ hours. Males averaged slightly more time on the river than females with 17.84 hours as compared with 17.14 hours for females. Males reported that 61 percent of the time spent on the river was subsistence related. Females reported spending 54.7 percent of the time related to subsistence activities.

**PFD program evaluation results.** An evaluation of the Tanana Chiefs Conference PFD program's existing records showed a total of 601 PFDs had been sold in the Interior of Alaska from 1990 to 1994. Of that total, 234 PFDs (39 percent) were sold to the people within the five study regions. A total of 86 child type III vests, 106 adult type III vests, and 42 type III adult float coats were shipped to the 5 villages. Tanana received 143 PFDs, Rampart received 76 PFDs, Ruby received 10 PFDs, Galena received 5 PFDs, and Stevens Village received 0 PFDs. It is significant to note that the village of Tanana extended the program into their village and has a selection of PFDs available for sale at cost at the village council office. In addition to the PFDs that the village received from the corporation, it has ordered and sold an additional 150 PFDs directly from the manufacturer. In addition to having the PFDs available, Tanana also has a strong advocate who supports and encourages PFD use. The village of Rampart also has a program where the PFDs are available for purchase in the village, but the village does not have any local programs to encourage PFD use.

## DISCUSSION

Although this study on PFD use was limited with respect to geography and population size, it yields several important findings. First, it establishes accurate baseline data for PFD use in the five regions. The data represent over 400 hours of direct observation and is the most valuable part of the study. This data can be used in future studies to evaluate the effectiveness of interventions along the river.

Second, the evaluation identified the regions where the program was the most active and traits that seem to increase the effectiveness of the program. The program was most successful in regions where there was a selection of PFDs available for purchase in the village. These regions sold considerably more PFDs than the regions where the PFDs were not immediately available in the village. Another factor was the amount of local support and encouragement for the use of PFDs. Tanana had the highest amount of PFDs sold and also has a very strong advocate and support program to encourage PFD use. A comparison of the number of PFDs sold to the observed usage rate also suggests that there may be a relationship between use and availability. There may be several explanations for the apparent relationship. One is that the program and the number of PFDs sold may only be serving as an indicator for the village's overall awareness and attitudes to PFD use. Also, it is possible that strong support and advocacy may influence the rest of the village's attitudes and usage rates. Future research needs to determine if the apparent relationships are accurate and the extent to which they influence PFD use.

Third, the mail survey provided useful PFD ownership information and insight into the amount and type of activities involved with boat use. It identified the type of PFD most commonly used, the most common purchase location, and the average amount paid. One of the most significant findings of the mail-out survey was that the respondents spent an average of 17.5 hours on the river each week; 60% of that time was related to subsistence activities. Future studies could address the relationship between the risk of a drowning to hours of exposure.

There was a discrepancy that raised a question as to the accuracy of the mail-out surveys with respect to usage rates. In comparing the actual observed PFD usage rates to the self-reported rates from the survey we find a discrepancy of 35 percent. The observed average usage rate was 54 percent and the self-reported usage rate was 89 percent. A possible explanation for the discrepancy could be the low survey response rate or the respondents' lack of accuracy in estimating their amount of PFD use (self-reported behavior). Another explanation could be that only those people who wear PFDs or who wanted to win a free PFD responded. The survey was, however, valuable because it identified some basic trends that will be helpful in future studies.

Future studies may include implementing a case control study in these regions. The PFD program will be expanded into 2 of the villages. The programs will be modeled after the program in Tanana. Emphasis will be placed on making the PFDs readily available for purchase in the village at a reduced cost. Additional emphasis will be placed on increasing the amount of support and encouragement for PFD use at the local level. The remaining 3 villages may be used as control groups to evaluate the effectiveness of the program modifications.

Due to their geographic location, their environment and lifestyles, rural Alaskans are at high risk for drowning. If we can increase the use of PFDs, drowning rates will be reduced. This project was the first step in evaluating and increasing PFD use. The data obtained identifies the current PFD usage rates and is vital to future studies because it can be used to evaluate the effectiveness of future implementation strategies.

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