

### ***Explanation of Hazards in Outdoor Recreation and Education***

Any outdoor activity has inherent risks. When planning a project in the outdoors it is important to account for the risk, accept the ones you cannot change, and mitigating the risk you can. The following pages are designed to give you a model to view risks, and the information you need to identify and mitigate the risk associated with your outdoor engagement project.

#### **I. Outdoor Activities and Risk**

1. How do you define an accident? Definition - chance or what happens by chance; an event that happens when quite unlooked for; an unforeseen and un-designed injury to a person; an unexpected happening; a casualty; a mishap. Accidents happen. You are expected to be prepared and to mitigate the risks.

2. Risks can lead to accidents. Most risks in the outdoors can be separate answers into Environmental Hazards and Human Factor Hazards.

3. What outdoor activities will be incorporated into your project? What risks are there? (note: these are questions for thinking, you do not have to respond in writing).

#### **II. Theory of Accidents - How Accidents Occur**

##### **1) Dynamics of Accidents Formula**

| Environmental Hazards |   | Human Factor Hazards |   | Accident Potential |
|-----------------------|---|----------------------|---|--------------------|
| - Terrain             |   | - physical condition |   |                    |
| - Weather             | X | - experience         | = |                    |
| - Equipment           |   | - skills             |   |                    |
|                       |   | - fear               |   |                    |
|                       |   | - communication      |   |                    |

##### **Dynamics of Accidents Model**

Environmental and Human factors can overlap to a greater or lesser extent. The greater the overlap, the higher the Accident Potential. The effect of combining Environmental Hazards and Human Factor Hazards multiplies the Accident Potential rather than simply being additive. The greater the number of hazards, the more quickly the Accident Potential can rise. For example:

2 Environmental Hazards x 2 Human Factor Hazards = 4 times higher Accident Potential

3 Environmental Hazards x 3 Human Factor Hazards = 9 times higher Accident Potential

A higher accident potential, does not necessarily mean don't go, but it does mean you need to take extra caution and be clear when it is time to return to safety if in doubt.

## **2) Examples of Hazards**

When assessing the potential environmental hazards you need to look at three factors.

### **Environmental Hazards**

#### **1. Activity**

Static - activities in which the environment is relatively unchanging (e.g. hiking)

Dynamic - activities in which the environment changes very quickly in unpredictable ways (e.g. whitewater paddling, biking)

#### **2. Location & terrain**

In remote locations you need to exercise additional precautions. One common method of accomplishing this is to list remoteness as an environmental hazard. For example, if you will be within an hour of medical care your remote environmental hazard = 0. If you are more than an hour from medical care your remote environmental hazard = 1. If you are a day from medical care your remote environmental hazard = 2. Below are some additional environmental hazards that depend upon your location and terrain:

- Rocky trails
- Walking off trail
- Exposed ledges
- Darkness
- Poison ivy
- Beestings

#### **3. Season/Climate**

Weather and the possibility of weather changes also have a significant impact on Accident Potential. Below are examples of environmental hazards that depend upon the season/climate:

- Cold temperatures
- Rain
- Overexposure to sun
- Snow

Beyond the activity, the equipment and driving/transportation are also considered environmental hazards:

## **B) Equipment**

- Broken stove

- Boots not broken in
- Improper clothing
- Inoperative equipment

### **C) Driving/Transportation**

- Bad road conditions
- Darkness
- Unfamiliar road
- Difficult road (CLASS I - VI)
- Other erratic drivers
- Pedestrians/cyclists

The second category is Human Factor Hazards. Below are examples organized into three categories: participants, leaders, drivers, and group dynamics.

### **Human Factor Hazards**

#### **A) Participants**

- No awareness of hazards
- No skills to avoid hazards
- Resistance to instructions
- Irresponsible/careless attitude towards self, others, equipment>
- Need to "prove" self, macho attitude
- Poor physical strength, stamina
- Fear, anxiety

#### **B) Leaders**

- Lack of knowledge of environmental hazards
- Inadequate skills to extricate group and self from hazards
- Poor safety judgment
- Poor teacher of necessary skills
- Instructions unclear
- Poor supervisor, does not correct problems
- Ineffectual under stress
- Lack of solid plan

#### **C) Drivers**

- Poor driving skills
- Rushing to meet schedule
- Overly tired on long drives
- Not driving defensively

#### **D) Group**

- Group not yet formed, lacks cooperative structure
- Interpersonal frictions unresolved
- Poor communication patterns excessive competition

- Scapegoating or lack of concern for slow or different individuals
- Excessive pressure or stress to "perform" - macho
- No practice in working harmoniously under stress
- Lack of leadership within group
- Splintering into sub-groups

### 3) Sample Accident Scenarios

Think of an accident situation you have been in whether on an outdoor trip or in some other setting. Analyze the situation and list the Environmental Hazards and the Human Factor Hazards that led to the Accident Potential.

#### Environmental Factor Hazards

#### Human Factor Hazards

### 4) Teaching the Formula = Reducing the Accident Potential

If you are leading a group in your project, it is essential to teach the Dynamics of Accidents Formula at the very beginning of any trip (or prior to leaving campus) so that all participants are aware of how their behavior is directly related to reducing the possibility of accidents.

Participants then can take some responsibility for their own safety. The formula gives you five basic things:

a technique for evaluating risk potential in the field

a tool for analyzing how accident potential can be reduced

a decision making tool

a rationale for why SUU Outdoor Engagement has particular things we teach, particular rules and policies

a rationale for why you make particular decisions

### 5) Environmental Briefing

A comprehensive Safety Program allows one to intervene to prevent Human Factor Hazards from overlapping with Environmental Hazards and thereby reducing the Accident Potential. In order to do this it is necessary to rethink from Day 1 of your project **what is the risk environment?** In planning a trip the leaders must examine the environment and the activities of the trip in order to ascertain what the possible environment hazards of that trip are. This information must be communicated to the group in the form of an Environmental Briefing at the beginning of the trip or experience with subsequent briefings when there is a change in environment or activity (e.g if a hiking group changes to canoeing the environment and activity have changed and there are different environmental hazards).

The first Environmental Briefing should follow the leaders' presentation of the Dynamics of Accidents formula. On longer trips it may be useful to have the participants do some of the Environmental Briefings once they are familiar with the formula. This can be done with the help of the leaders. The Environmental Briefings set a tone for safety and help inculcate the idea that the participant is responsible for his/her own behavior.