Intermountain Bird Observatory (Draft) Hawk Watch Protocol

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Intermountain Bird Observatory's Lucky Peak Hawk Watch Protocol

Introduction and Brief History of the Project:

The Intermountain Bird Observatory (IBO; formerly Idaho Bird Observatory) is an Academic Research Program of Boise State University. The IBO is located within the College of Arts and Sciences, and collaborates directly with the Department of Biological Sciences and Raptor Research Center at Boise State. The IBO provides research and training opportunities for both graduate and undergraduate students at Boise State.

The IBO began in 1992 when students and faculty of Boise State discovered a significant raptor migration corridor along the Boise Ridge, located in southwest Idaho near Boise. Exploratory hawk migration counts were conducted throughout southern Idaho and the greatest concentration of migrating raptors were found along the Boise Ridge. Several sites were explored along the ridge during fall of 1993, and the greatest concentration of migrating raptors was found at Lucky Peak, the southernmost peak on the Ridge.

During 1994, an exploratory hawk migration count was conducted at Lucky Peak using one qualified observer. During this first season, we developed a standardized protocol for an annual hawk migration count taking into account beginning and ending dates, daily timing of the count, scanning and data recording procedures, and number of observers. Beginning in fall 1995, this standardized protocol has been followed annually. The main objective of the hawk migration count is not to count every individual migrant raptor during the autumn migration, but rather to adopt a standardized protocol that will allow the vast majority of passing raptors to be recorded. The long-term goal of this annual monitoring effort is to collect data on western migratory raptor populations that can be used in regional or continental raptor population trend analyses. Other important purposes of the hawk migration count are to promote watchable wildlife viewing, public education, and to provide volunteer opportunities for the local public.

So, You're Going to Hawk Watch at Lucky Peak?

If you have received this protocol, you have likely accepted a fall internship with IBO counting raptors, are a volunteer, or are working closely with IBO in some other capacity. First, you will need to work out the details of the internship with IBO staff including arrival and departure dates, stipend, days off, etc. It is recommended that you study the IBO website so that you fully understand what IBO does, where, and why. The website also contains detailed directions that will help you arrive safely at the Lucky Peak field research station.

The Lucky Peak field station is a remote camp located just a few miles from Boise, the state's capital city. Despite being close to town, the field site is

located on the top of a mountain with limited public access. The field station is accessed via Highland Valley Road, and 4-wd or high-clearance vehicles are necessary to travel this road. The field site has no running water or power. Crews routinely fill water jugs and transport them to the site for water. Propane lanterns are used for lighting if necessary, and all crew members use their own headlamps. Outhouses are made available for crews and visitors, and these facilities are serviced regularly throughout the season. IBO provides a camp kitchen outfitted with stoves, cookware, plates, and utensils. It is the crew's responsibility to keep these items clean, orderly, and in working order.

IBO's fall migration project includes not only the hawk migration count, but also songbird mist-netting, hawk banding, and forest owl banding, all at the same location. Each of these projects has its own crew, and typically an additional intern or two rotates through all projects, so there can be as many as 12 interns camping together at the site during the fall migration season. The camp is arranged with a centralized cooking area where crews can prepare meals and relax after shifts. Each intern typically brings their own tent and personal sleeping gear, and tents are dispersed around the main camp so that they are out of the way and in comfortable and quiet sites for sleeping. Vegetation at the main camp is a mixture of conifer trees and mountain deciduous shrubs, so a shady spot is not hard to find. Another focal point of the field site is the songbird banding facility. Care should be taken not to set up your personal tent near the banding facility, as large crowds of visitors are often entertained there, especially on weekends.

In addition to your own tent and personal sleeping gear, you will need to bring appropriate clothing for the entire season. If you are flying to Boise, you might want to consider having your cold-weather gear sent ahead by family or friends. Clothing will be most critical for the hawk watch crew since you are exposed to the elements all day long. When you arrive at the site in August, you may be in shorts, T-shirt, and sandals, but weather could turn brutally cold at any time during the season (even in August). Early in the season your main concern will be bright sun and sunburn. Make sure to bring sunscreen (spf 45!), lip balm (Idaho is a dry place!), big hats, neckerchiefs, and anything else that will help you avoid the sun's brutal rays. As the season progresses, however, ambient temperatures steadily drop, especially when weather is influenced by passing cold fronts. Observers will learn quickly that layers are the way to go, as the weather can vary greatly from the start of the day to the end. It is recommended that you also plan for frigid cold by packing long underwear, wind-resistant outerwear, sweaters and fleeces, wool pants, gloves, warm headwear, and even pac-style winter boots if you have them. Temperatures at the field site are generally good through the end of September-even through mid-October, but remember, you are at 6,000 feet in elevation, and weather at the site can be directly influenced by storm fronts and the jet stream. On hawk

watch you will be completely exposed the weather. Just a few hundred feet below the peak in camp, the experience can be altogether different than on top of the mountain. Come prepared!

The hawk migration count begins on August 25th each fall. It is a good idea to arrive at least a day ahead of time (2 days is recommended) to set up your tent and become familiarized with the field site. Also, you should purchase a supply of food and any necessary personal gear ahead of time, as you will not be able to go to town on a daily basis for supplies-come prepared! No power means no refrigerators. The crew keeps perishables cold using shared ice chests, but ice and space are limited. Sharing some food items and communal cooking are recommended. Dry food such as rice, beans, flour, etc. must be kept in containers that exclude mice and other small mammals. Bears have only been an issue at the field site during two seasons, but using good common sense is always prudent.

Lucky Peak sits within the Boise River Wildlife Management Area, a state-run wildlife management area maintained by Idaho Department of Fish and Game. The main purpose of this WMA is to provide quality winter range for big game, namely mule deer and elk. About 6 miles from the field site, along the main highway, is the WMA office. IBO stores its field equipment at this location during the off season. This is where you will store your vehicle if you drive to Boise. If you own a 4-wd vehicle, it is possible to park the vehicle at the field station, but we always try to keep the number of vehicles at the field site to a minimum to make room for public visitors and reduce "clutter" and impact to vegetation at the site. The WMA office is equipped with a shower and restroom, and these facilities are also available to crew members. Crew members are NOT allowed to use computer facilities or phones at the WMA office, so please help us maintain a good working relationship with the Dept. of Fish and Game, and don't ask! There is also a freezer located at the WMA office where we typically freeze water in plastic jugs to help keep our ice chests cold at the field site. You will be expected to replace thawed jugs for frozen ones throughout the season. Running water from a good-tasting well is also available at the WMA office to fill water jugs for camp, and filling empty jugs is also expected anytime any intern drives down to the WMA office. In addition, when both crew members and volunteers head to town, they should offer to bring down trash and recyclables from camp, and to exchange charged for drained owl batteries if needed (almost always).

Boise State University is located approximately 45 minutes away from the field station in downtown Boise. Computer labs are available to you at the university near the IBO offices where you can check email and connect to the internet. If you don't have your own vehicle, a university vehicle is typically made available to the IBO crew each fall for local use. You will have to coordinate use of this

vehicle with other crew members, and it can be used to go to town for groceries, to access computer facilities at the university, laundry, and other project-related uses. You will be able to go to town on your days off or after shifts as vehicle access, weather, and other project-related activities allow.

Set Up and Equipment:
Conducting the hawk migration count is relatively simple in terms of equipment and supplies needed when compared to trapping and banding. Before the first official count day, the following list of items will need to be gathered and checked to make sure they are all in operating condition.

1) Plastic owl decoy
2) Two-way radios, AA batteries
3) Supply of pens, clipboards, folders, etc.
4) Data forms and notebook
5) Hawk watch protocol
6) Past annual report
7) Hawk watch books and raptor field guides
8) Hand-held weather device, hearing aid batteries
9) Chairs
10) Binoculars, telescope, and personal gear

A plastic owl decoy will need be placed at the top of one of the fir trees just east of the hawk counting site. The owl draws some raptors closer to the count site, as they cannot resist the urge to try to drive the predator away, even during migration. The owl may help bring raptors close enough to the count site that might otherwise be missed, especially from the trees and valleys to the east where visibility is partially blocked. Certain species such as Merlins and Northern Goshawks love to attack the owl and might not be seen by the counters otherwise. The owl should be connected via duct tape to a piece of steel conduit (like those used for mist nets). It has historically been placed in a large fir with an abnormal, flat crown located immediately to the east of the hawk counting site. Getting the owl into the tree is at least a two person job. One will climb the tree and attach the pole and owl to the top braches with duct tape, while the other stands atop the peak and makes sure the climber is in the right tree, and that the owl is sufficiently far enough above the branches and facing north. (The eyes will help grab the attention of birds coming in from the north, and should thus be as prominent as possible). Once positioned in the tree, the owl will need be secured in place with a hefty amount of duct tape as it is affected by winds throughout the season. The owl is part of the protocol and should be in place by the first day of the count.

At least three two-way radios should be present with the hawk watching equipment. These will primarily be used for communications with the hawk

trapping station and the songbird banding crew. All radios will have to be on the same channel to communicate between the three locations. Hawk counters and raptor banders communicate regularly throughout the day on a number of topics (discussed below). Less often, hawk counters communicate with the songbird crew to make note of unusual birds observed or trapped, or to discuss when it is ideal to send visitors. It has been found that channel thirteen, sub-channel three, is relatively free of traffic in the area, and therefore, ideal for use by Intermountain Bird Observatory staff and volunteers. If distracting traffic is present, it will be necessary for all IBO radios to move to a different channel. The radios should be on at all times that there are observers on hawk watch and trappers in the hawk trapping station(s). It will be the responsibility of the observers to keep working batteries in their radio, which often means keeping spare batteries in pockets and keeping any rechargeable batteries charged.

There will be a number of necessary communications between hawk counters and banders. Hawk counters will need to know each trapper and their preferences for communication. Some banders like counters to alert them to incoming birds, especially unusual or rare species. The primary responsibility of hawk counters is, of course, to maintain the standardized hawk count, and communication with the banding crew is secondary. Hawk counters often request that banders send birds to hawk watch for release if visitors are present or if rare or unusual species are trapped. Hawk counters will also need to communicate with banders to traffic visitors in and out of blinds if this is possible on any given day (not always possible). See the *Education* section for more information on these activities.

Before the counting season begins, IBO will provide a supply of data sheets, pens, pencils, clipboards, and folders for recording and protecting data sheets. Always be prepared with extra writing utensils on hawk watch as climatic conditions are rough on pens. It is always best to collect data in ink! Pencil smudges, is affected by water, and does not last. Do not cross out mistakes, instead use white out. Keep data sheets clean! There is nothing worse than messy data! Keep spare data sheets clean and dry by storing them in the folders provided. Store completed forms in the folders provided in chronological order, and make all efforts to keep the data sheets clean, dry, and without creases or dog-eared corners. Remember, these data sheets have not yet been entered-this is the only copy of the raw data until they are turned in to IBO staff at the end of each month and photocopied! It is your responsibility to collect and safely store these data. It is best to store completed data forms in a secure and centralized location in camp. A sufficient number of data sheets should be copied before the start of the season, but if it looks like you are going to run out, it is your responsibility to make IBO staff aware of this. Please do so several days before you are going to run out, as it may take a few days to make copies and deliver them to the field site. If it is more convenient, photocopiers are

available for crew use at Boise State University near the IBO offices. A notebook will also be made available to the hawk counting crew. This notebook is for recording information about local raptors, migration of other species, or other pertinent information not recorded on standardized data sheets.

A copy of this protocol should be with the observers at all times. It is also recommended to have a copy of the previous year's final report to compare daily, monthly, and seasonal totals. The report is also a great resource to share with visitors. IBO provides the observers with a "library" of hawk watch and hawk identification literature, to be used for training and public education at the observers' discretion. All books do not need to be brought to hawk watch each day, but keeping one or two of the observers' favorites handy is a decent idea for quick reference of an unusual sighting or to help explain something to a visitor. It is highly recommended that observers read thoroughly and more than once *Hawks in Flight* by Dunne et al. either before the season or within the first week; IBO has two copies of this reference on hand.

The observers will be provided with a compass and *Skymaster* or other weather measuring device. The latter should be capable of measuring wind speed, barometric pressure, and temperature, which are variables measured at the mid-point of each hour of observation to best represent weather variables during that entire hour. It is the responsibility of the observers to be familiar with this tool's use and functions, including calibration and switching to proper units of measure. The *Skymaster* is powered by a small hearing-aid battery. It is a good idea to have an extra battery for the device handy during the season. The compass will be used to determine wind direction, and should be calibrated to 17^{o} for declination. The compass and *Skymaster* will need to be on hawk watch every day, but will also be shared with the owl banding crew each night. Make proper arrangements for sharing these pieces of equipment ahead of time so that they are not misplaced.

IBO maintains a number of folding camp chairs of various shapes, sizes and colors that observers can use on hawk watch. Chairs are to be carried from camp to hawk watch each day and not left at the observation point overnight (high winds, hikers, etc.). You will find that using a chair greatly increases your comfort on hawk watch, however, as described below, it is often necessary to move about the hawk counting site to properly ID passing raptors and to scan the entire sky, so don't get too comfortable in your chair!

Obviously, you will need to bring binoculars and spotting scope to hawk watch every day. IBO has a supply of both if you do not have your own, however, it is recommended that you use your own optics if possible as you are most familiar with them. To meet our standardized protocol, your binoculars should be 10x42's. All other gear to be used on hawk watch is the responsibility of the

observer to provide. It is recommended that you bring all food, water, and other personal gear to hawk watch each day in some kind of back pack or gear bag to prevent it from blowing away. Important items include hat, gloves, wind-proof jacket (and pants), sunscreen, lip balm, snacks and lunch, water bottles/thermoses, tissues, sunglasses, etc. You will quickly learn which items you will need. Even though camp is just a few hundred feet from the observation site, you will need to bring all food, water and personal gear with you each day. It is not acceptable to leave the observation point (except for bathroom breaks) during your shift, so if you think you will need it, bring it with you! You will, however, quickly learn to suck up to other crew members in order to entice them into bringing hot chocolate or other desired hot beverages or baked goods to you at the observation site on cold days.

While everyone will need to maintain contact with the outside world during the ~2.5 month season with the IBO, hawk counting requires dedication and unbroken concentration. While an occasional brief phone call may be necessary for us all, cell phone use by hawk counters is seriously frowned upon. You cannot effectively count migrating raptors while talking on the phone, so do not make a habit of it. Other devices which will not be tollerated while conducting the count include transistor radios, iPods, televisions, DVD players, lap top computers, or other such electronic devices. You will need not only your eyesight to effectively count migrating raptors, but your hearing and other senses as well. Even on the coldest days of the season, it is never acceptable to conduct the count from a parked vehicle!

Observer Location and Scanning Methods While on Hawk Watch

Where to Stand or Sit?

Protocol is that at least two official, qualified observers will conduct the count at all times throughout the season. They should be positioned at the top of the peak north of the communication tower, west of the road leading downhill to camp, and east of the trail leading downhill to the trapping station. Observers should stay north of the USGS benchmark unless following a passing bird. Observers will line up roughly east/west on the peak between the landmarks mentioned above, and the observer on the east side should stay far enough to the north to be able to see in front of the conifer trees to the east of the observation point (where the owl is). The observer on the east side will be better off staying a bit farther north of the west observer. The observer on the west side should be sufficiently west to be able to see the entire trapping station and the lower foothills to the west. It is especially important to be able to see this lower west side, as flight lines (especially early in the day) often become established low and to the west.

The observers need be close enough to each other that they can easily communicate a migrant's status, keeping in mind that they may be facing in opposite directions on different birds, and be competing with high winds, multiple hats and muffs covering the ears, and visitors (which could include boisterous school groups). Education of the public and providing quality wildlife viewing experiences are a huge priority to IBO, however, you must be able to maintain the standardized count at all times. Some level of crowd control will become necessary at various times throughout the season when large groups are present. While IBO staff, other crew members, or volunteers may (and should) assist with larger groups on hawk watch, it is ultimately the observers' responsibility to be sure they have maximized their ability to detect and record migrants while being kind and courteous to visitors at all times. Visitors should be kept behind the hawk counters, however, some individuals may wish to lie down in front of the observation point. It is up to the hawk counters to decide what visitor activities are compatible with the standardized hawk count.

Optics and Scanning Procedure

Observers should use moderate to high-quality ten power binoculars to aide in detection and identification of raptors. Higher-powered spotting scopes may be used to aide in identification of distant birds, but should not be used to detect migrants. While the sky is loosely divided between the two observers, an effort should be made to have only one observer scanning with binoculars for distant birds at any given time while the other makes sure that close birds are not missed. Falcons are notorious for "popping" up out of nowhere to pass quickly or attack the owl. Do not spend too much time scanning through your binoculars. A good rule of thumb is the 50:50 rule: scan with binoculars half the time and with the naked eye half the time-it's simple! Your scanning procedure should be standardized and be roughly the same each time you scan. Observers should be scanning both above and below horizon. Daily weather and flight conditions will dictate your exact scanning procedure each day, but generally, you should complete about a third of your scan, break to look with the naked eye, complete the next third of your scan, break again, then complete your scan and break again.

On the west side, most days you will start your scan to the north, scanning the horizon over Shaw Mountain, moving west to Boise Peak, Shafer Butte, and Squaw Butte (see discussion below about landmarks). Your scan will continue west over the "uplift", governor's mansion, downtown, Table Rock, and the airport. Lastly, your scan will work south of the observation point on the west side to look for birds that may have already passed unseen. The observer on the west side should be sure to cover the areas behind and below the trapping station. Birds are often picked up in the draw and above the road, southwest of the trapping station.

On the east side, the observer will also start the scan on the horizon above Shaw Mountain. Working east, you will scan the horizon over a series of peaks creatively named #1, #2, #3, and #4, until you reach the trees immediately east of the observation point. Care should be taken to scan below horizon on the east side, making sure to look along the ridge through the "saddle". Adequate coverage of the sky directly above the observers should also be maintained. It is much easier to pick up raptors against the sky above when there is cloud cover, but even on clear days, birds can be spotted overhead if you look hard.

On a typical morning, the flight starts out on the east side of the ridge, but moves to the west or overhead as thermals build with increasing temperatures. Each day is a new day with different weather conditions. These conditions, including temperature, wind speed and direction, cloud cover, smoke, and other environmental variables greatly affect the flight conditions. It is your responsibility to maintain a standardized scanning procedure to be able to record the majority of passing raptors, no matter where they might be passing in relation to the count site. Often, a semi-distinct flight line will be formed and adhered to by most migrants according to wind and weather patterns. For example, winds with an easterly component accompanied by overcast skies will create a low flight to the east, while a hot sunny day with little wind and excellent thermals may favor birds passing on the west or directly above the count site. Note, however, that not every bird will follow suit, and different lines may be formed by light and buoyant Sharp-shinned Hawks or American Kestrels versus larger, soaring Red-tailed Hawks or Golden Eagles. While effort should be adjusted for different conditions and flights, no part of the sky should be ignored. On higher volume days or days when birds seem to be low and hugging the Boise Ridge, less effort should be devoted to scanning with binoculars. Use your best judgment, keeping in mind that you see substantially less sky while scanning with binoculars versus the naked eye.

As migrants move south towards the observers it may become necessary for both observers to be on loose groups or kettles to confirm numbers, or a single bird to confirm identification. It may also be ideal to have a qualified volunteer stay on a bird as it comes in from the north (freeing the official observers to keep scanning for other birds), and the greatest effort possible should always be made to get as many visitors on as many birds as possible to enhance their experience at IBO. For all of these reasons, it is a good idea for the observers (and regular volunteers and other crew members) to be familiar with the hawk watch landmarks. It is much easier for your fellow observers or volunteers to find birds if the entire crew uses landmarks consistently.

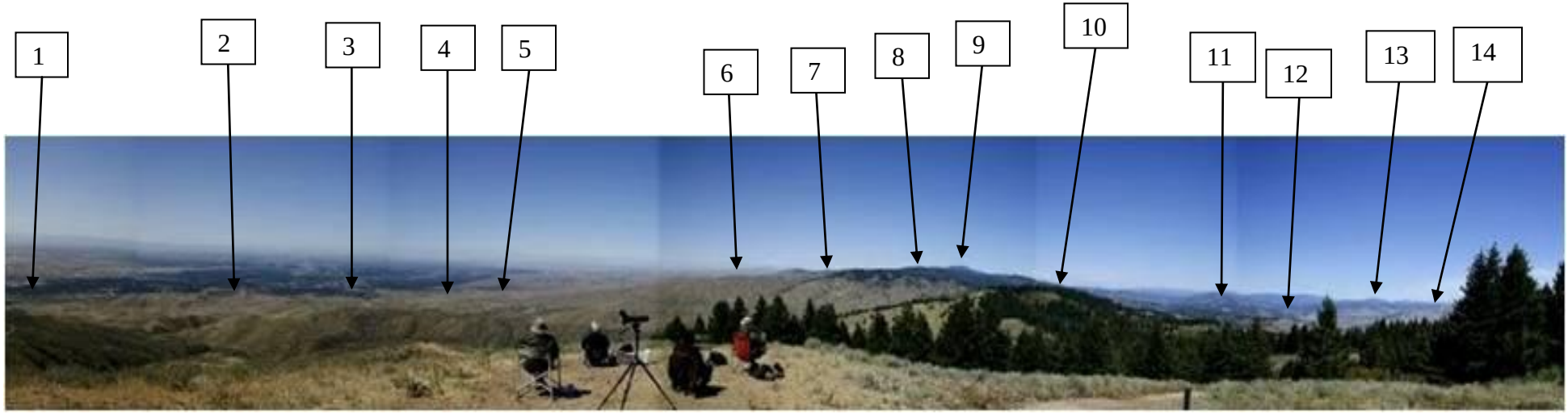


Figure 1. Panoramic view from the hawk migration count site at Lucky Peak looking north along the Boise Ridge and showing major landmarks. Numbers correspond to landmarks presented in Table 1 below.

Table 1. Landmarks at Lucky Peak raptor migration count site.

Number in Fig. 1	Landmark	Side of Ridge
1	Boise Airport	West
2	Table Rock	West
3	Downtown Boise	West
4	Governor's Mansion	West
5	The Uplift	West
6	Squaw Butte	West
7	Stack Rock	West
8	Boise Peak	West
9	Shafer Butte	Center
10	Shaw Mountain	Center
11	#1	East
12	#2	East
13	#3	East
14	#4	East

Determining the Migratory Status of a Raptor

Is it a Local?

When counting raptors at Lucky Peak, it is important to be consistent in determining migratory status of the birds recorded. In addition to using the Boise Ridge as a migration corridor, many raptors use the area for breeding, staging for migration, and hunting during migration. There are resident raptors that use this area year round and do not migrate. Therefore, not every raptor seen is recorded on official count data sheets; rather, raptors must first be classified as migrants before they can be recorded. How is this done? This determination can be an art as much as a science, and is compounded at the Lucky Peak site by a number of factors. This section, more than others in the protocol, constitutes guidelines as much as rules. Best judgment should be used in all questionable cases.

In general, migrants during fall in North America move from north to south. Thus, this general direction of flight is the first thing that should be looked for in determining a bird's migratory status. Note that on some days, flight conditions may exist that cause birds to come off the ridge north of Lucky Peak. Typically, a flight line moving generally north/south will become apparent to the observers, and birds following that flight line will not need to be followed quite so closely. Raptors taking more unique flight lines, even if still traveling generally north/south, should, however, be watched with a keener eye. Birds heading southwest across the Treasure Valley, or southeast to utilize mountain updrafts, may very well be migrants. Be aware, however, that a local bird may kettle up with a migrant for some time in the same thermal, and even stream south for quite some distance, before peeling off in a different direction. Migrants may also be escorted by a local bird through the local's territory, especially in the case of Golden Eagles or Red-tailed Hawks.

Both Golden Eagle and Red-tailed Hawk breeding territories exist at Lucky Peak, and the breeding adults and young-of-the-year from these territories can be troublesome. Some behaviors to look for exhibited by resident birds includes perching in prominent locations, vocalization (yarping, screaming, etc.) , aerial displays, foot dragging, chasing or stooping at other raptors, and traveling in a direction other than north/south. Generally, it takes the first week of the season to become familiar with the local birds' daily movements and behaviors before you can become confident that you are recording only migrant birds. Hawk counting during migration is not an exact science, so certainly mistakes will be made. Keep in mind that the objective of the count is to record the majority of migrants in a consistent manner, not every single bird.

An imaginary 'finish line' can be envisioned running roughly east-west through the observation point. This 'finish line' can be a useful basic tool to aide in

determination of a bird's migratory status. If a raptor is first seen to the north of the observation point, moves north to south in a more-or-less straight line, crosses the finish line and continues south, then it is safe to record that bird as a migrant. Crossing the finish line at Lucky Peak is not, however, a black and white rule for determining migratory status. Some birds may need to be followed well south to determine that they are indeed migrants. There is a certain gamble in assessing the ideal amount of time to stay with a single bird, as it is most ideal to be able to return to scanning one's sector of the sky as quickly as possible to avoid missing other migrants. As always, use your best judgment in determining migratory status.

One of the key topographical features that make Lucky Peak a migration corridor and concentration point is also a hindrance in determining the migratory status of some birds. Lucky Peak is the southernmost peak on the ridge, so for many birds it is the point where they have to make the decision to either cross the Snake River Plain or find some other way around. Many raptors may pass the observation point, only to circle back later and head back up the ridge. Others may arrive too late in the day to cross the desert and stop to hunt and roost at Lucky Peak (American Kestrels are a good example of this). Both these common behaviors will confound your ability to accurately assess migratory status. Do your best, and accept the fact that some birds will be missed while others might be counted more than once. Observers should take advantage of slow days early in the season, following birds longer to become familiar with the subtle differences between behaviors and flight attitudes of migratory vs. resident raptors. This will help later in the season when peak migration days occur or large groups of visitors are present.

Some species consistently present site-specific problems at Lucky Peak with respect to determining migratory status. Below we make note of each of these species and their general behaviors with regard to determining migratory status.

Turkey Vulture: Turkey Vultures can be gregarious at all times of year, and often cover much ground in their search for meals. Groups may meander past Lucky Peak in a generally southerly direction and at high altitudes while searching for food, but not actually migrating. To separate the migrants from the wandering locals, take note of the flight style. Both migratory and local Turkey Vultures will ride up on thermals and then glide of the top to the next thermal. The gliding flight between thermals of local birds is often quite indecisive, with a good bit of rocking on wings held in a high dihedral. Migratory Vultures, on the other hand, seem quite motivated in getting to the next thermal, in a more direct flight with wrists bent and tails closed, displaying less of a dihedral and a good bit less rocking. Also, if one were to connect the dots between the thermals used, they would typically find those of the migratory birds to be in a straighter line than the zigzagging of locals. In general, Turkey

Vultures stage for migration along the Boise Ridge during early-mid-September, gradually increasing in numbers. When they begin migrating, a distinct change in behavior occurs and this will be noticeable to you.

Red-tailed Hawk: Many Red-tailed Hawks frequent the Treasure Valley and Boise Ridge, and are seen on a daily basis from Lucky Peak. Often times they are seen hunting along the terraced shrub steppe hills north of the observation point. While migratory birds do have to eat, for the most part any Red-tailed Hawk spending more than a few seconds kiting can be ignored as a local (with the exception of birds distracted by the trapping station). Likewise, migratory Red-tailed Hawks are not typically vocal, so vocalizing individuals can be ignored. Resident Red-tailed Hawks typically make local movements at low altitudes while migrants can and do reach high altitudes (sometimes too high to even detect). While following a generally southerly route is an indication of migratory behavior, circling up beyond the limits of the observer's vision with binoculars can generally be assumed a trait of migrants as well. With the extensive plumage variation in the species (and possibly molt patterns as well), observers may get to know local individuals by a distinguishing characteristic, but caution is urged in taking this approach to determine migratory status. It is a good idea to record plumage characteristics and daily behavior of resident raptors in the journal provided by IBO-doing so will alert you to regular activity patterns of frequently-seen resident individuals.

Ferruginous Hawk: Despite often exhibiting east/west movements at Lucky Peak, there are no known Ferruginous Hawk breeding territories in the Boise Foothills near Lucky Peak. So few are seen each year by our hawk counters that it is recommended that they be counted as migrants regardless of direction of travel.

Golden Eagle: There are a few known Golden Eagle nesting territories along the Boise Ridge, and both the adults and young remain in the area throughout the fall migration period. Furthermore, the home range for Golden Eagles can be huge, and 'local' individuals may be seen from the observation point flying in any direction on a given day. As such, Golden Eagles typically have to be followed longer (further south) than other raptors to confirm migratory status. Golden Eagles doing the undulating display flight (consistently stooping and then coming up with wings tucked) can be assumed to be non-migratory, and birds clearly hunting can likewise be ignored. Otherwise, all Golden Eagles should be followed as far south of the finish line as time and conditions permit. Observers should also be aware that local Golden Eagles will often escort migratory eagles through their territory, so if a pair is headed south, both need be confirmed as migrants (do not assume that because one is confirmed a migrant that the other was as well). Finally, observers should be particularly cautious when calling an adult Golden Eagle migratory in August and early/mid September; adult Golden

Eagles typically migrate later than the young birds in fall, and adults typically do not start migrating past Lucky Peak until late September and October.

Northern Goshawk: Northern Goshawks, like adult Golden Eagles, may breed in the wooded areas around Lucky Peak, but do not typically migrate through southern Idaho until later in the season. Goshawks are regularly seen in camp, or from the observation point popping out of the woods for a pass at a lure bird or the owl before returning to the east. While some Goshawks will migrate low above or perhaps through the trees to the east, the southerly direction of their flight should be apparent. Observers should be prepared for questioning when declaring any Goshawk migratory before September fifteenth, and when calling an adult a migrant before October first. Such things can happen, but rarely. Beacause in the western U.S. Goshawks may be more elevational migrants rather than north to south migrants, they often exhibit flight patterns that are more east/west or west/east than other species.

American Kestrel: American Kestrels are one of the most commonly-recorded raptors from Lucky Peak. The peak of their migration occurs early in the season during late August and early September. Perhaps more obvious than with other raptor species, Kestrels tend to stage at Lucky Peak late in the day. By this we mean that Kestrels build in numbers at the count site as the afternoon progresses. Maybe it is due to their reluctance to cross the Snake River Plain late in the day, or maybe hunting conditions at Lucky Peak are just ideal in the afternoons, however, this can be a source of confusion for counters. On these days, dozens of Kestrels may move along the ridge from north to south, only to stop directly at the observation point to hunt the open slopes to the west. These birds confound matters by circling the peak throughout the afternoon. Moreover, the Kestrels are never seen by observers the next morning, so if they were not counted in the afternoon they would surely be missed. The best advice to give hawk counters is to count Kestrels moving generally north to south along the ridge, but disregard the finish line. It is best to count only the new Kestrels moving into the area, and do not pay attention to the birds hunting the nearby slopes or stooping into the trapping station. Try to keep track of Kestrels that move back to the north as they circle the peak, subtracting them from the count. No method is accurate all of the time. Again, use your best judgment. No two counters, no matter how experienced, can keep track of every hunting Kestrel on a busy afternoon.

A final note of caution and inspiration: In general, the raptors whose migratory status are questionable and require a judgment call not addressed in this protocol make up a minority of the flight. If an observer is worried about missing or misclassifying a raptor, worry not. Anyone who spends any decent amount of time at a hawk watch will miss some birds while looking for, identifying, or determining the migratory status of others. While we strive to

minimize these cases, it is far more important to put effort into maintaining the consistency of the standardized count. Hawk migration counts and the resulting data are tools to assess population trends in migratory raptors, not attempts at determining the exact number of raptors migrating past a site.

Interference from the Trapping Station

In addition to complications with local birds and inconsistent flight lines, the observers will have to cope with determining the migratory status of birds distracted by and/or caught in the trapping station. You will often be following a raptor from north to south, only to have it dive into the trapping station and get caught, or worse, disappear from sight at the station never to return. Despite how interesting it may seem, your main job duty is to conduct the standardized raptor migration count, not watch the trapping station. In most cases, birds generally heading north/south that disappear into the trapping station should be recorded as migrants (even though you don't see them cross the finish line). Observers will find it important to keep track of trapped birds and their release to avoid double counting. Released birds typically enter the nearby conifer stand to perch and regain their senses, only to continue migration later that day or even the next day. Therefore, it would be easy to double count these raptors unless you kept close track of their releases. However, it is not always possible on busy days or when visitors are present to maintain close radio contact with the trapping blind. Again, do your best and use your best judgment.

At other times, birds may be attracted to the station and captured that you didn't see ahead of time. Again, keep track of releases, and record birds leaving the trapping station and heading south as migrants. Some days, especially when the flight is low and to the west, the only birds you might see are those going into the trapping station. Some birds may not be seen coming into the station at all, in which case their behavior and direction of flight is monitored upon release. In other cases, a raptor may come in to the station from the south. Keep in mind that the density of raptors at the site is generally high during fall migration so many raptors can be trapped that are not actively migrating. For that matter, hawk trapping continues to be productive most afternoons after the migration flight ceases and hawk counters end their shift, because migrants that have stopped for the day are interested in finding prey and roosting.

Recording the Data: Raptors and Observation Conditions.

When to Start Counting:

The Lucky Peak hawk migration count begins on August 25th each year and ends on October 31st. During this period, migrating raptors are recorded 7 days per week as weather conditions allow. Unlike many hawk migration sites elsewhere in the world, we have found the raptor migration at Lucky Peak to be primarily

an afternoon phenomenon, correlated with the strength of rising thermals on a typical day. For this reason, our standardized protocol was developed to emphasize counting during late morning, afternoons, and early evenings at Lucky Peak. Hundreds of hours of exploratory counts conducted during early morning at Lucky Peak have proven to be mostly unproductive. Raptors observed during early morning hours are generally making local movements associated with hunting behavior, not migratory flights.

During late August (Aug. 25th- Aug. 31st), the hawk migration count begins at noon (MDT) each day. Counts are typically small (20-50 raptors per day) during this period, however, 100+ raptor days are possible at this time. Most important during this early period is that counters become familiar with the hawk watch protocol, data recording procedures, raptor identification, and major landmarks. During September and October, the count begins at 10:00 AM (MDT) each day. The flight typically begins to pick up after 11:00 AM, however, depending on weather conditions, it may start earlier. Be sure that you make your way to the observation point early enough each day to begin the count at 10:00 AM. This means that you should be at the observation point a few minutes early, organize your data sheets, pens, *Skymaster*, radios, etc., so that you can begin counting at exactly 10:00 AM. Do not be late! If you are routinely late for your shift you will hear about it from IBO staff.

When to Stop Counting:

While starting times for the daily count are standardized at noon (August) and 10:00 AM (Sept. and Oct.), daily ending times are not. This is because the end of the daily raptor flight at Lucky Peak varies greatly with weather conditions, time of the season, predominant species being counted, and other factors. The count must continue each day until at least 5:00 PM, and should continue until the flight ends. The general rule is that after 5:00 PM, counters should stop counting when the flight ends for the day. The end of the flight is loosely determined as one half hour after the passage of the last migrant raptor. What does this mean? Starting at 4:30 PM, counters should keep track of the time of passage of the last migrant. If none pass in the half hour between 4:30 PM and 5:00 PM, then the count ends at 5:00 PM. If birds are still migrating between 4:30 PM and 5:00 PM, but nothing passes between 5:00 PM and 5:30 PM, the count ends at 5:30 PM. It is best to end the count on the hour or half hour mark to facilitate calculation of daily effort. Early in the season, especially when American Kestrels are abundant, the flight might not end until 8:00 PM! Don't worry, though, in late October, the daily flight will rarely continue after 5:00 PM. Keep in mind that there still might be many raptors in the area hunting and securing roosting sites for the night. Often times, raptor trapping actually picks up after the migration flight ceases for the day, so don't gauge when to stop based on the action at the trapping station. Again, use good judgment: the count is not intended to count every single raptor. As such, if a single bird is

seen flying south past the lookout at 17:05, but no birds pass in the next twenty-five minutes, it is acceptable to end the count at 17:30. Use good judgment; hawk counters need not be masochistic! Note that raptors may still be in the air in the last half hour of the count, just not migrating.

Stopping due to Weather

Occasionally, hawk watching should be suspended due to weather conditions. Most importantly, do not remain on the peak during lightening storms. Raptors may migrate in light precipitation, and under such conditions, the count should continue. However, heavy precipitation and storm cells that impede visibility do constitute a reason to suspend the count. If counters suspend the count due to weather, the Peak should be checked for improving conditions at least every 90 minutes. Some of the best flights can occur late in the day after the ridge has been "socked in" all day. During periods when large storm fronts affect the entire region and precipitation has been predicted for the entire day, it is acceptable to take the day off. These are great days to head to town for a movie, hot shower, lunch at your favorite restaurant, or whatever. Keep in mind, though, that some great flights occur in the late afternoon at Lucky Peak after storms dissipate, so keep your eye on the mountain and head back if conditions improve. Rarely will weather conditions keep you from counting for long; it always seems to clear back up during the fall in a day or so.

Later in the season, especially after the passage of cold fronts, dense cloud banks may form below the peak in the mornings. These cloud banks often work their way up the mountain, increasing in size, until before you know it, the observation point is "socked in". When the observation point is in the clouds, you may suspend the count, but continue checking at least every 90 minutes for improving conditions. Note also that under certain conditions, one side of the mountain may be socked in and the other is not, which means that the decision to curtail or restart the count should be made from the observation point, not the camping area.

Education and Public Outreach

While the data collected on hawkwatch is important, public education is central to the existence of the Intermountain Bird Observatory. Many individuals will find themselves atop Lucky Peak: some are there for recreational activities independent of the IBO, while others are visiting to see the birds in the sky or in the hand. There will be hikers, bikers, hunters, hang gliders, geocachers, and other individuals who did not know the Intermountain Bird Observatory existed. Many groups will organize visits ahead of time, some visitors may be regular volunteers, and still others may be at the site for the first time. Each of these

subsets of visitors come with their own mentalities, personalities, and opinions, and observers should be prepared to greet, interact, and educate all of them.

Ideally, an IBO education person will be present for all scheduled groups to inform the public about the IBO and the importance of what we do. We typically stress why monitoring of migratory bird populations is important, what it can tell biologists about raptor populations and their habitats, and how these populations can be used as global environmental indicators. However, almost daily the hawk migration counters will be visited by individuals or smaller unscheduled groups, and it is a critical part of your job to welcome the public and be kind, courteous, and informative. It will always be a balancing act between scanning and recording migrants and interacting with the public. Don't stress about this. Missing one or two migrants in order to hook an individual on birding and biology, or to create a new Intermountain Bird Observatory donor is well worth it. On slower days, it may be ideal for one observer to take over hawkwatch while the other gives their full attention to visitor entertainment for a few minutes.

Observers will need to interact with all levels of the public, from young to old, from seasoned birders and environmental enthusiast to individuals who just want a break from city life. We want each visitor to leave enlightened about the IBO, birds, migration, and the importance of habitat and conservation. Do your best without preaching. The greatest thing about the IBO is that it often speaks for itself. The birds themselves do the most for public education; just getting people out there and observing nature is more than half the battle. You should find it more than rewarding to interact with the public, especially the youngsters that visit IBO. Can you remember when you got 'hooked' on nature and birds? Did someone help you? Keep in mind that the next moment at Lucky Peak might be just that moment for someone else. Do your best to instill that wonder for nature in every visitor that you encounter.

While the staff and volunteers of Intermountain Bird Observatory should do their best to make visitors' experiences as positive and educational as possible, observers should not be afraid to do some crowd control. This may include keeping visitors behind the observers so as to not obstruct views, and making sure that visitors are not interfering too much with observer communication and bird identification. Most visitors will respect observers having a job to do. Also, any extended education talks should go on behind the observers; observers should not shy from making this point clear to other IBO staff and volunteers.

Raptors in the hand are more tangible for many people than dots in the sky thousands of feet away over the Treasure Valley. As such, for many visitors, trapping is more interesting than hawk counting. At IBO, we pride ourselves in accepting visitors to the hawk trapping stations when possible and practical, and

never hide the fact that live lure birds are used to trap migrating hawks. Lure birds are given the best possible care, and both federal and state permits are in place for all of IBO's activities. The observers will have to act as a liaison between the trapping station and visitors at the observation point. Observers should be familiar with each trapper's comfort level with visitors, namely how many they are willing to have in the blind with them. With the radio, observers will then need to alert the trapper(s) that visitors are on their way down the hill. The visitors will need to be warned of the tripping hazards in the trapping station and how to approach the blind, being mindful that they may need to follow the trapper's instructions to freeze should a bird fly into the station while the visitor is walking down. Time should be made early in the season to familiarize each observer with the trapping station so as to be able to explain exactly what goes on there to visitors (until you have actually been in the station, it all seems so magical from hawkwatch). Keep in mind that when large groups are present at Lucky Peak, it is not possible for every visitor to visit the hawk trapping station (the trapping blinds seat three comfortably with one standing). However, for smaller groups or members of larger groups that 'just have to see it for themselves', a 20-30 minute visit to the station is possible if the hawk trapper agrees.

When visitors are present at the observation point, captured raptors are often brought from the trapping station for 'show and tell' before release. These educational demonstrations are central to the outreach activities of the IBO. Nothing 'hooks' people and affects people as deeply as looking into a wild raptor's eyes, or getting to release a bird of prey back to the wild. Ideally, a qualified Intermountain Bird Observatory staff or volunteer other than the official observers or lead trapper will be available to bring the birds up the hill and do the demonstration. Many times, however, one of the observers will have to show off the bird. Most moderately-competent visitors will be able to bring a raptor up the hill in a holding can, and will be shown how to do that by the trapper. An official counter walking down the hill is a last resort, but is acceptable on slower days. Time should be found early in the season to train observers how to handle raptors, and observers should be able to tell visitors about the data collected from a bird in the hand and point out a few field marks, lifestyle adaptations, and migratory habits of the raptor that are appropriate to the visitor or group being addressed. Releasing a wild raptor is an amazing, intimate, and potentially life-changing experience we would like to provide all visitors. That being said, it can be dangerous for human and bird alike; observers only need to let visitors do what the observers are comfortable with. Finally, the trappers need to know the release time of each bird, so the observers should radio this information to the trappers upon release. Holding cans should also make their way back to the trapping station as soon as possible.

Recording Data

Lucky Peak hawk counts are recorded on standard forms published by HawkWatch International for sites in the Western U.S. These forms are printed using both sides of legal-size paper. The front side of the form is devoted mainly to tallying the numbers of raptors observed, and the back is for recording weather data, characteristics of the flight, and the number of hours of observation for each observer.

Daily Data

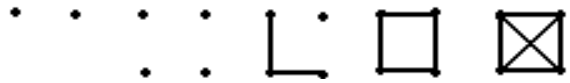
On BOTH sides, in the upper left, there is an area to record the site name, date, full names of all official observers, the start and end times of observation, and total observation hours. On most days, you will only fill out one set of start and end times. Space for up to three start and end times is provided in case of temporary stoppage of observation during the day, such as during a storm. These fields should be filled out on both sides of the sheet, and should be identical. On the back side of the sheet, to the right of the observer names are columns for start and end times for each individual observer, so the total number of observer-hours for the day can be calculated. Observation hours and observer-hours are not the same thing, and both need to be recorded.

Hourly data

Hourly data is recorded in three separate tables on the datasheet. There is the large matrix on the front side of the sheet where the observations of raptors are recorded, and on the back, a table for flight information, and another for weather data.

The Observation Matrix

Each row of the matrix represents an hour, and each column represents a type of raptor. Each hour, make a tally for each type of raptor seen, using the method illustrated below:



=2 =4 =6 =8

Some species have multiple columns for the count to be separated by sex, age, or color morph. These species will also have columns labeled "U," for "Unknown" which are to be used whenever the sex, age, or color morph cannot be determined conclusively. Do not be afraid to use the U columns. It is not expected that every bird will be fully identifiable, and neither guessing nor gambling makes the data more useful. Some birds will not even be conclusively identifiable to species. For these, there are columns for genera. For Buteos, there is a single column for Unknown Buteo (UB), while for Falcons and Accipiters, there are categories for Small (S), Large (L), and Unknown (U). A Small Falcon is one that, judging by size, is definitely either a Kestrel or Merlin. A Large Falcon is one that could only be a Prairie Falcon, Peregrine Falcon, or Gyrfalcon. A Small Accipiter is one that's definitely either a Sharp-shinned Hawk

or male Cooper's Hawk. A Large Accipiter is one that's definitely either a Goshawk or a female Cooper's Hawk. While identifying the bird to this level is not as useful as having it identified to species, it's better than nothing, and it's more honest than guessing. There is one column reserved for raptors which couldn't be identified to genus (UU). This column should only be used when, for instance, a bird might be either an SS or SF, or might either be an NG or UB. UU's on our sheets are, frankly, undesirable- barely better than nothing. If you're marking down many UU's, ask for help, and bone up on your ID skills. Always make sure you get a good enough look at any bird to be sure it's a raptor (not a raven or woodpecker) before you decide to mark it as a UU. False raptors are worse than missed raptors.

List of Two-Letter Codes

Accipiters

SS Sharp-shinned Hawk
CH Cooper's Hawk
NG Northern Goshawk
SA Small Accipiter (SS or CH-M)
LA Large Accipiter (NG or CH-F)
UA Accipiter- size unknown

Buteos

RT Red-tailed Hawk
SW Swainson's Hawk
BW Broad-Winged Hawk
FH Ferruginous Hawk
RL Rough-legged Hawk
RS Red-shouldered Hawk
UB Unknown Buteo

Falcons

AK American Kestrel
ML Merlin
PG Peregrine Falcon
PR Prairie Falcon
GY Gyrfalcon
SF Small Falcon (AK or ML)
LF Large Falcon (PG or PR or GY)
UF Falcon- size unknown

Other Species

TV Turkey Vulture
NH Northern Harrier
OS Osprey

GE Golden Eagle
BE Bald Eagle
UE Unknown Eagle
UU Unknown Raptor (genus not known)

Characteristics
A Adult
I Immature (HY)
S Subadult, AHY (eagles only- see notes below)
NA Non-Adult (eagles only- see notes below)
L Light Morph
D Dark Morph
M Male
F Female
BR Brown (Northern Harrier only, when AF vs. I determination cannot be made)
U Unknown

Notes on HWI codes (From HWI Observers' Manual - January 2008 http://www.hawkwatch.org/talons/images/stories/observers_manual_2008.pdf)

1) Golden Eagles: HWI code **"I"** refers to a juvenile or first-year bird with bold white in the tail, usually white wing patches, no tawny bar on wings, and no molt visible. It may be hard to definitively classify an eagle as "I", but we want to try to see what proportion can be identified (the immature:adult ratio is one piece of information that has the potential to help link migration sites to specific breeding populations, especially for Golden Eagles and Northern Goshawks, and also is the key to tracking productivity trends). Juveniles may be particularly hard to identify in spring as the upper wing coverts begin to fade and appear similar to the tawny barring characteristic of older subadults and therefore should be coded as subadults. HWI code **"S"** refers to non-hatch-year subadult birds with white in the tail and either visible molt or tawny bars on the wings. Such birds may or may not have white in the wings. If you think it is a juvenile without white in the wings (based on boldly patterned tail, uniformly colored flight feathers, and no tawny bar) call it an "I". HWI code **"NA"** is for any non-adult birds that have white in the tail or wing, but other plumage characteristics were not adequately seen to distinguish between juvenile and other subadult plumages. HWI code **"A"** is for birds that **you are sure** are adults (this can be difficult to distinguish if the bird is seen only from below and the tail is not fully fanned-out—remaining white in the tail can be obscured). HWI code **"U"** is for any birds that are not adequately observed to make an age determination. Birds that you know are not juveniles but are unable to distinguish as adults or subadults should be coded as 'U" with the comment of "not juvenile".

2) Bald Eagles: HWI code **"I"** refers to a juvenile or first-year bird, which usually is dark breasted and tawny bellied, with a dark tail (may have variable amounts of white) and "pointy" secondaries all the same length (hard to see). HWI code **"S1"** refers to subadult Basic I and II plumages illustrated in guidebooks (also sometimes referred to as White-belly I and II); i.e., birds with a white belly, an upside-down white triangle on the back, head and tail still mottled, and possibly retained juvenile secondaries (hard to see). A small percentage of birds may retain a dark or tawny belly, but have other subadult characteristics, so be cautious when using belly color for identification. HWI code **"S2"** refers to a combination of older subadult plumages, including Basic III and transition plumages that you may see in guidebooks. If you are able to identify birds to this category, they may show some or all of the following characteristics: osprey like head with dark eyeline, "sooty" white head or tail, body mostly dark but still molting, and tail mostly white but with dark terminal band. HWI code **"NA"** is for any non-adult birds that are not seen clearly enough to categorize as "I", "S1", or "S2".
HWI code **"A"** is for adults with a white head and tail. This category is likely to include birds in near adult plumage with dark flecks in the head and some black on the tail tips that may not be readily distinguished in flight. If you do see these near adult characteristics, whether through a scope or a close view, record the bird as adult, but make a note about the finer details in the comments section. HWI code **"U"** is for any birds not adequately observed to make an age determination.

3) Be careful aging Sharp-shinned and Cooper's Hawks strictly from a topside view of the back color. Many adults, particularly females, can look very brown, even in good light. Be sure about your aging; otherwise use unknown.

4) Rufous Red-tailed Hawks and other buteos are considered dark-morphs. Adult rufous red-tails are those with brown bellies, a rufous bib, and dark under-wings obscuring the dark patagium. Many western red-tails show a heavy rufous wash on the breast and a darker bellyband, but their underwings are less heavily marked and the dark patagium is distinct compared to classic rufous-morphs.

5) Aging and plumage codes are available for Swainson's Hawks, but aging birds in flight may be difficult and we do not expect every bird to be aged. Be aware that Swainson's have a Basic 1 plumage (second-year birds in fall) that is distinct from both adult and immature plumage, but may be difficult to distinguish from first-year birds. If you are able to accurately age a Swainson's Hawk, put that information in the comments field but be sure to use only standard coding in the main countrecord area.

6) American Kestrel and Northern Harrier sexing is fairly straightforward, but if you are unsure about age and sex for brown harriers, use the "BR" code for

unknown brown birds. Some adult female harriers show rufous coloring along with streaking throughout the breast and belly. If juveniles have streaking, it is usually restricted to the sides and upper breast and is narrow and less bold compared to adult females. In the Northern Harrier column on your data sheet, make sure that you clearly mark an "I" for juvenile birds so it is not confused with a "1" signifying one bird counted (which really should be a dot on the data sheet). Feel free to record any other comments in the comments field for the relevant hour, including subspecies distinctions, additional sex-age data, notes about unusual melanistic or albinistic birds, behavior notes, etc.

Weather Data

Weather Data needs to be collected at the start of the day, the end of the day, and every hour as close to the midpoint of the hour (:30) as possible. Always record the actual time the observation was made. Follow the instructions on the sheet carefully and always use the correct units of measurement. To collect weather data with the portable weather station (Skymaster or Kestrel), first power on the unit and open the cover for the windspeed impeller. Next, determine the direction of the wind (dropping some dry grass can help in light winds), and use the compass to ascertain the direction in degrees. Facing directly into the wind, hold the weather station vertically, slightly above eye level, being careful not to block the flow of air through the impeller. Windspeed data should be collected for about 30 seconds before writing down the average and maximum values (given by the device) in kilometers per hour. Barometric pressure and temperature should also be recorded from the portable weather station. Be sure to let the station warm or cool to the ambient air temperature before recording the temperature. You can save valuable time by keeping the weather station in the open air, but shaded from the sun, when it is not in use. Use common sense though; it is a sensitive electronic device, and shouldn't be allowed to sit out in the rain.

End of Season Take Down, Report Writing, and Data Entry

Unless agreed upon ahead of time, your hawk counting internship will likely be for 2.5 months with the Intermountain Bird Observatory. This period covers the last week of August, the months of September and October, and the first week of November for take down, report writing, and data entry. Do not expect to leave until all of these tasks have been completed. If all goes well, you should expect to be able to be done and move on to your next great adventure no later than November 4th or 5th.

Take Down

The hawk migration count at Lucky Peak is the last Intermountain Bird Observatory project to end during the fall. You will be required to help IBO staff and volunteers dismantle the Lucky Peak research station, clean and organize field equipment, and store it for the off-season. All equipment and supplies must be taken from the field station and stored-nothing is left on site through the winter months. Please keep this in mind as the songbird and owl banding projects finish up. It will be in your best interest to urge these other crews to do as much take down as possible so as to not leave everything for you to do after October 31st. The weather is typically inclement at this time, creating an urgency to get everything "off the mountain" as fast as possible so as not to get snowbound.

What is your responsibility (and others')? All trash and recycling; camp wall tents and cooking equipment; all food; all trapping gear; all communal camp gear such as chairs, cots, etc.; all banding blinds; the hawk count plastic owl; all vehicles; all trailers; all data and other literature; IBO merchandise; all signs; etc. It is favorable to begin take down as early as mid-October, slowly removing and cleaning everything that is not of vital importance so that final take down is made easier. The more that the other crews do ahead of time before they leave, the less you will have to do at the end of October. Do not leave everything to the last minute, and do not let the other crews "stick" you with having to do everything at the end!

You will also help IBO staff and volunteers with cleaning all field gear. All cooking gear, all trapping gear, all banding blinds, all lure bird cages, trailers, etc. will need to be thoroughly cleaned at the WMA before storage for the winter. Many of these duties will occur during the first few days of November and should only take two days at the maximum.

Report Writing

You will be required to draft the *Hawk Watch* portions of the IBO annual summary report for the avian migration project. You will have been maintaining daily count totals throughout the season, but this Excel spreadsheet will be

finalized and checked for error. The report contains a section on methods and one on results. Methods should not change dramatically, but if minor changes occurred during the season, this section will need to be updated. Tables and text in the Results section of the report will have to be updated, as well. This is relatively easy and takes only a day or less at the most to accomplish.

You may also be asked (or feel inspired) to write a short article for the IBO newsletter. If you have had a great time working for IBO and want to write a short popular article that you think would be a good addition to our newsletter, please talk to the Director about this. We always appreciate good content for our newsletter, and hope that crew members can help with this.

If you are a photographer and have taken photos during your internship at IBO, we would love it if you shared them with us. We are always in need of good photos depicting our banding or educational activities, or of cool or exceptionally beautiful birds. Although we have thousands of great IBO photos already, we can always use more high-quality photos. Please share yours with us!

Data Entry

You will also be required to enter hawk migration count data into the HawkWatch International/HMANA data base. Please see instructions below. Data entry should take no more than a few days to complete, and can certainly be started before the season ends. These instructions are intended to enable the yearly entry of Hawk Watch count data into the Intermountain Bird Observatory database – BoiseRidgeHawkWatch.mdb.

Requirements: The database is currently only supported in Microsoft Access 2007.

History: This particular database structure was provided by another organization collecting data from many sites for a US wide study into hawk migration (RPI Project). They were kind enough to enter much of the historical data (thru 2005) and provide the database structure. Unfortunately, the database programming was not complete and as a result, not all of the capability is supported. Therefore, we are only utilizing a small portion of the entire database. The data entry will occur directly into 4 tables of the database and not utilize the forms which have been built. If someone wishes to work to resolve the issues with the forms, feel free.

Data Entry: The data is entered into 4 separate Microsoft Access tables and correlates will with the data collection worksheets used in the field. The tables are "Hours" (one record per day indicating the hours of operation), "Flight" (one record per hour including # observers, visitors, etc), "Weather" (one record for each hour with weather conditions), and "Observations" (one record per species per hour of observations).

Detailed Table Suggestions:
Hours: This table contains one record per day. If the raptor counting operated continuously for a given date, then only three values are entered – start time, end time, and total hours (in decimal not in hh.mm, i.e. 1.5 hours instead of 1:30). Note that the hours on the datasheet are often entered in 1:30 style format and must be converted. If monitoring was suspended during the day then restarted, the time intervals for each window is to be entered (StartTime2,EndTime2, StartTime3,…).

Flight: This table includes a record for each hour of operation, aligned to whole hours. The hour begin value is not entered in time format (hh:mm), but in military format (i.e. 1200) and is always aligned to even hundreds. For example, if monitoring started at 12:30pm, the "HourBegin" field should be 1200 and the MinutesObservation would be 30. The number of observers , visitors, and visitor disturbance are also collected in this table.

Weather: This table includes the weather data collected at least hourly during watch periods. There are a number of available columns as some of the data collection methodologies have varied over the years. Use the columns appropriate for the current collection mechanism. The time field accepts the time the reading was actually taken, whereas the hour file includes the whole hour for while that weather applies (i.e. 1235 for time would be for hour 1200).

Cloudtype should be entered without commas if multiple values are recorded (i.e.CF or CS). Cloudtype should be in capital letters.

Observations: Observations is where most of the data entry will occur. A separate record is recorded for each square in the observations portion of the worksheet which has an observation. Essentially there will be one record for each species and class combination seen each hour. The database will not accept two records for the same species/class in the same hour. The unique data in each record will be the date, the hour, the species (i.e. SS, TV, …), the class (i.e. I, U, M, F), and the count seen that hour. All species and classes must be in capital letters.

Data Entry Efficiency Considerations: The following have been shown to help speed the data entry process.

- If ever concerned about how to enter some data, look in the database at previous entries from previous years.
- Edit each table design to default the "Entered By" field to the data entry initials. (Only do this if you know what you are doing, otherwise ask for help).
- Use ctrl-` to copy the previous rows value into a cell.
- Open all 4 tables in separate windows and just switch between using "Switch Windows"