# 2011 SAFENET Review

## Introduction

The SAFENET system was established during the 2000 fire season in response to a recommendation from Phase III of the TriData Wildland Fire Safety Awareness Study. The SAFENET program was developed as a method for reporting and resolving health and safety concerns encountered by wildland fire personnel. These reports can come from wildland fires, prescribed fires, wildland fire training, fitness testing, fuels treatments and all hazard incidents. The data collected through the SAFENET program helps identify problem areas as well as short and long term trends. SAFENET is sponsored by the National Wildfire Coordinating Group (NWCG).

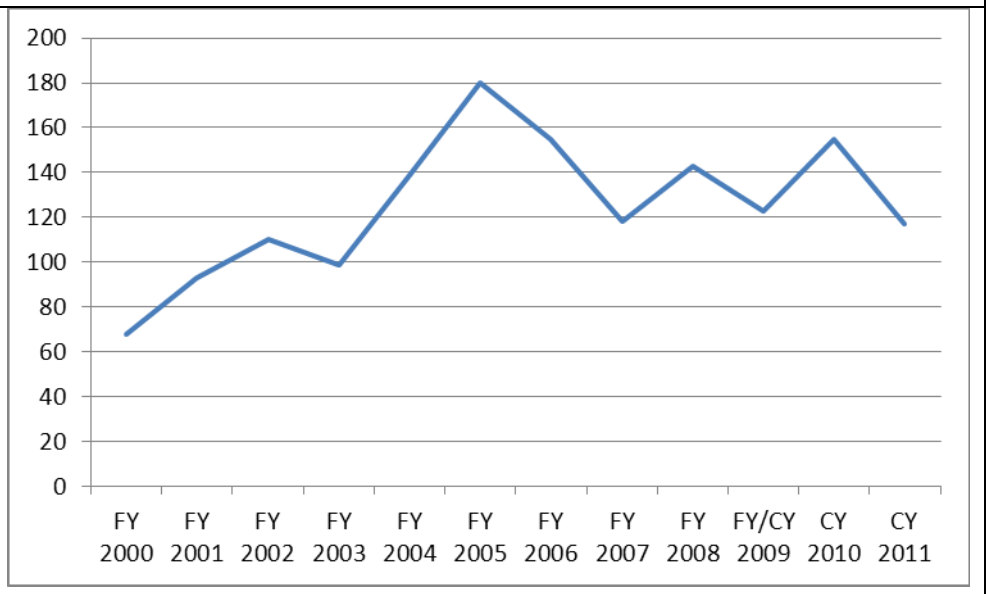
The NWCG Risk Management Committee (RMC) is responsible for the management of the SAFENET program, and developing an annual report of SAFENETs submitted. This summary covers the calendar year January 1, 2011 through December 31, 2011.

There were 117 SAFENETs submitted this year. The number of SAFENET reports varies from year to year, with a high of 180 in 2005, and low of 68 in the first year of the program in 2000. The 117 reported this year was a decrease from the number of SAFENETs submitted in 2010. Even with a significant increase in fire activity in the Southwest, there was a 25% drop in the number of SAFENETs submitted this year compared to 2010.

One possible reason for the drop can be traced to the number of reports filed by the BLM. In 2010 the BLM did a big roll out for High Reliability Organizations and that included a focus on reporting. The field took that to heart and the number of SAFENETs reported by the BLM in 2010 doubled (30 to 68). In 2011 the BLM returned to their normal numbers (68 to 31). Another possible reason for the drop in submissions is the introduction of the SAFENET Field Card. This focuses on corrective action at the field level. And submission of the SAFENET Field Card information is optional.

The following table and graph shows the number of SAFENETs filed per year since it was established in 2000.

| Total SAFENETs Reported | |
|---|---|
| FY 2000 | 68 |
| FY 2001 | 93 |
| FY 2002 | 110 |
| FY 2003 | 99 |
| FY 2004 | 139 |
| FY 2005 | 180 |
| FY 2006 | 155 |
| FY 2007 | 118 |
| FY 2008 | 143 |
| FY/CY 2009 | 123 |
| CY 2010 | 155 |
| CY 2011 | 117 |

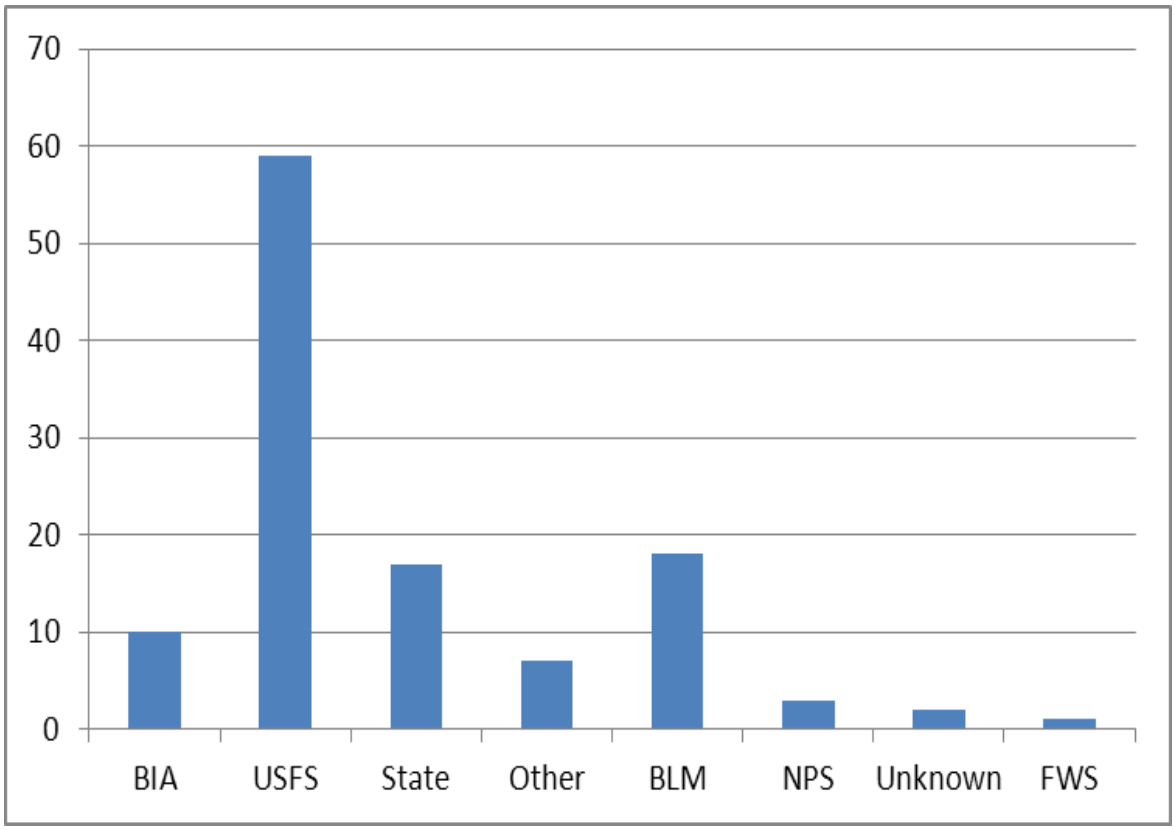



**What Happens to a SAFENET?**

After a wildland firefighter submits a SAFENET, it is forwarded to the national fire management safety program manager for the jurisdictional agency identified in the submission. In addition to the five federal land management agencies, a representative from the states is identified for SAFENET notification. This state person represents the interests of state, county and local fire units. These individuals determine the course of action for the submission, forwarding to the regional, state or local level for an appropriate response.

The jurisdictional agency, that is the agency that owns the land where the incident took place, is responsible for reviewing the issue identified, and the actions taken in the submission, and if necessary makes a corrective action outlining the agency's response as warranted. On the next page is a graph showing the number of SAFENETs submitted for each jurisdictional agency.

## Submissions by Jurisdictional Agency 2011

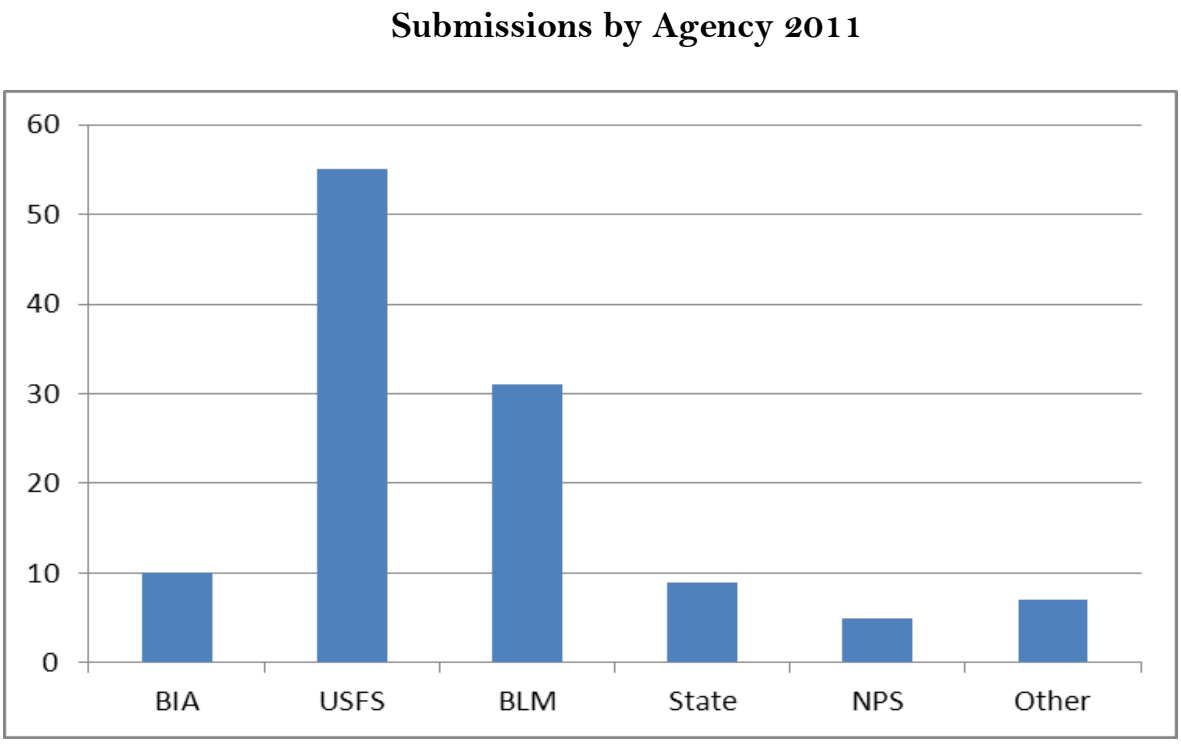



| BIA | USFS | State | Other | BLM | NPS | Unknown | FWS |
|---|---|---|---|---|---|---|---|
| 10 | 59 | 17 | 7 | 18 | 3 | 2 | 1 |

Based on percentages, in 2011 the USDA Forest Service (USFS) had the most reports with 50%, followed by the Bureau of Land Management (BLM) and States each with 15%. The relatively high percentage of State jurisdiction reports reflects the high level of fire activity in Southwest states including Texas. Bureau of Indian Affairs (BIA) had 8%, the 'Other' category (which includes FEMA, local fire departments and counties) received 7%, and the National Park Service (NPS) received 4%.

For the jurisdictional agencies, the USFS showed an increase in the number of submissions from the previous year, the states were the same, while the other agencies saw their submissions decrease from 2010.

In comparison, the following graph identifies the number of SAFENETs submissions by agency for 2011.




| BIA | USFS | BLM | State | NPS | Other | FWS |
|---|---|---|---|---|---|---|
| 10 | 55 | 31 | 9 | 5 | 7 | 0 |

USFS and BLM employees continue to file the majority of SAFENETs. The rest of the submissions are distributed amongst the other agencies and states, along with county and local fire departments which make up the "Other" category.

The graph below shows the number of SAFENETS submitted by agency since the program started in 2000. The graph show the highest number submitted by each agency in a year, as well as the lowest number, the average, and total by agency.

## SAFENET Submissions by Agency Since 2000

| Agency | Low | High | Average | Total |
|---|---|---|---|---|
| USFS | 27 | 94 | 56 | 680 |
| BLM | 23 | 68 | 35 | 424 |
| BIA | 4 | 18 | 10 | 128 |
| NPS | 3 | 12 | 7 | 84 |
| FWS | 0 | 13 | 4 | 46 |
| State | 0 | 13 | 6 | 78 |
| Other | 3 | 15 | 5 | 66 |

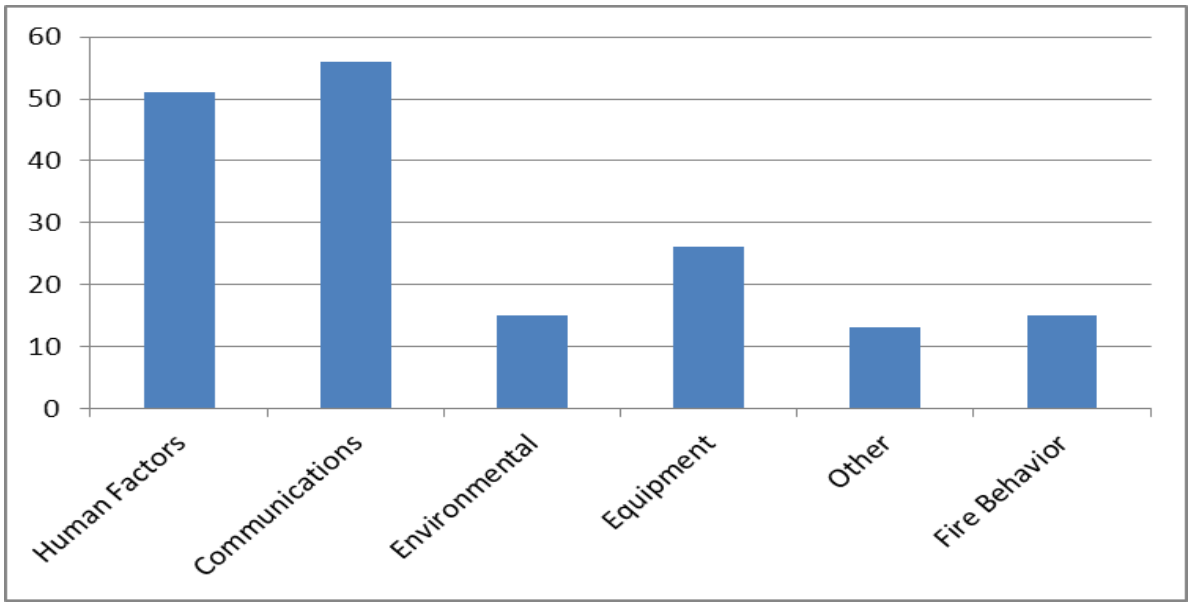
## Contributing Factors - 2011

One of the important components of a safety related reporting system is the identification of contributing factors. The SAFENET system allows the submitter to choose from six different elements that may be present. These elements are: Communications, Human Factors, Equipment, Fire Behavior, Environmental, and Other. As in most years, human factors and communications are the leading categories for 2011.

Many submissions cite more than one contributing factor. As an example, a crew may decide to relocate to another part the fire. As they get back to their vehicles they find the fire has made a large run or is spotting across their primary route away from the fire. Some of the elements that may have contributed to the problem may include fire behavior, environmental, communication, or various human factors.

## Contributing Factors by Category

| Human Factors | Communications | Environmental | Equipment | Other | Fire Behavior |
|---|---|---|---|---|---|
| 51 | 56 | 15 | 26 | 13 | 15 |




Human Factors – 43%

This category consists of several elements including Decision Making, Leadership, Situational Awareness, Risk Assessment, Performance, and Fatigue. Many of these elements are overlapping in nature and are subjective based on the opinion of the SAFENET submitter. Below are a few examples of submissions received that exhibit each of these elements.

Decision Making

- Crews exceeding work rest guidelines when working on multiple fires.
- Individual on a fire was both leading falling operations and acted as IC. He recognized the problems of split responsibilities, but could not correct it due to lack of qualified people on scene.
- Crew member was transported to a hospital ER without having an agency representative accompany the FF to the hospital.
- One fire reported airspace incursions/near misses occurred because ground forces requested helicopters change locations or target areas.
- Dozer operator experienced 'burn over', including minor injuries, but did not report the incident or injuries.
- Agency vehicle ran through a stop sign, no collision or injuries.
- Burn out operations begun below crew working on fire line.
- Members of the public were self-dispatched to fire; it is not clear whether these 'farm hands' had Red Cards.

Leadership

- Crews and equipment are ordered to leave a safety zone (10-12 acres) and move down a road in front of the fire.
- Strike team leader lead a team of engines faster than posted speed limit.
- On a fire that crossed jurisdictional boundaries, IC did not contact all of the dispatch centers working the incident. IC could not be contacted during fire blow up.
- CRWB and FMO allowed crew to exceed work rest guidelines.
- Line supervisors from other agencies would not allow certain firing operations.
- On a multiple jurisdiction fire there was no coordination for burn out operation on adjacent divisions.
- During the transition phase there was poor coordination/communication between outgoing/incoming Teams and crews working on the ground.
- Local unit administrator contacted dispatch to cancel orders for equipment. IC and others in the chain did not know about these actions.
- A home unit supervisor reported numerous safety concerns on a fire including no support for shifts (food and water); medical evacuations; improper transport of FFs.
- Crew boss and trainee report to ICP; intend to transition as crew leadership on Type 2 IA crew, with no communication to the crew.
- Two engine crews were working on a burn out operation without coordinating their efforts.

Situational Awareness

- Three Incident Information Officer trainees working on an incident had not completed S130/190, nor had they received any instruction on the use of fire shelters; and they made an unescorted trip to the fireline.
- Engines and water tenders were driving over a bridge that had a weight limit. All vehicles exceeded that limit when loaded with water.
- A burn out was initiated before all crews were notified; engine boss was acting on his own to burn out.
- Aerial ignition for a burn was begun without communication with ground forces.
- An unknown helicopter made a low pass over a fire, the rotor wash created additional hazards. As the crew was leaving the fire area the helicopter returned and appeared to make a bucket drop.
- A burn out operation was initiated without any plan or warning to crews.
- While scouting the fire IC slid down a small cliff; used hose as rope to get out.
- Preparing to initiate a dozer line, a buried pipeline was found; there was no mention of a pipeline during the briefing.

Performance

- Operator failed to secure Type 3 engine (transmission, chock, brake). Engine rolled into camp, stopping on a rock next to a tent.
- Crew was held in camp because the CRWB was not available.
- An operator that was carded as an ATVO flipped an ATV on an RX fire operation.

- Engine drivers drove past parked vehicles too fast and too close; outside rearview mirror on engine was hit and broken.
- RXB2 did not send IAP and other critical information to dispatch center before start of the Rx burn.
- Person was igniting fire ahead of the main fire without communication with IC and other units. This individual did this twice within 24 hours.
- A medical 'incident with in an incident' occurred at 0200 hours. Neither the medical unit leader, nor safety officer could be reached.
- Firefighter/faller not wearing PPE.
- Firefighter burned his hand because he grabbed a heated gated wye without gloves.
- Riding an ATV at night, FF rolled machine.

Risk Assessment

- Drivers are acting with a false sense of control by exceeding the speed limit and not ensuring passengers are buckled up.
- Burn out operations on active fire put ground resources in danger.
- DIVS runs through flames to escape entrapment.

Fatigue and Illness

- While working on Rx fire, FF complained of heavy chest pressure. The day after, FF went to hospital and was diagnosed with heart attack.

Communication – 48%

The majority of the submissions for communication issues dealt with radio, repeater and frequency issues. Some examples are listed below.

- Engine on scene of incident could not contact IC.
- Poor/incorrect direction given to ICP causing an engine crew to exceed work rest guidelines.
- Radio repeater and phone land line went out at the same time. Some areas had cell phone service and provided work around through third party.
- Tac channel and local repeater channel where the same on a fire.
- Radio network developed high pitched tone that impacted radio communication. For two days dispatch was unable to receive radio traffic from the field.
- Truck mounted Bendix King radio would not work if engine was in idle; only if running at high RPM.
- After an Rx fire damaged a structure and electrical equipment, attempts to contact appropriate owners/contractors were hampered because current contact information was not accurate.
- Changes in radio frequencies that occurred during a changeover to a Type 2 team resulted in many crews and locations not being able to communicate to the IC.
- A repeater was not functioning during a fire incident. Communications from the ground to dispatch during the incident was through the district office which had radio communication with the fire, and land line communication with the dispatch center.

- Nearby forests use the same frequencies and share repeaters. This causes cross communication on some fires.
- Some local fire departments have switched to 800 MHz radios, but BK and Midlands are not compatible. This requires the use of a third party or other measures to communicate on mutual assist fires.
- IC from local fire department could not use forest repeaters to communicate with units of the fire. They had to use third party to communicate on the fire.
- The lease for the land where one of the repeaters used to be expired so the repeater is not there. This caused a lack of communication between a fire and the dispatch center.
- When communicating by radio on a state fire, the state/county resources could not hear the transmissions from federal radios. Post incident investigation revealed that state radios had a code guard, and that without the code outside transmissions would not come through.
- Mountain top repeater does not transmit communications from mobile or handheld radios.
- Phone lines to dispatch center not working. Lack of communication caused delays in fire reporting, dispatching units to fires.
- A number of Bendix King radios were not working properly on an incident.
- A lightning storm knocked out power to a dispatch center. The backup system only lasted 2 hours.
- The phone system going to a dispatch center is having chronic problems. The fixes only last a few days.
- Radio communications with dispatch center are intermittent due to open line squelch. This impacted incident safety and communications.
- Repeater was not able to function when using hand held radios during an incident.
- State and local departments are 'tone protecting' some of their frequencies. This blocks outside units from talking with them.
- Interference from outside users on a repeater causes communication problems. The current solution is to shut down the repeater and lose capability in some locations.
- Repeater failure during multiple fire starts put firefighters at risk.
- Radio 'upgrades' can leave units out of reach from some communication messages.
- Units in travel status and some units on active fires can be assigned same frequencies.
- System was taken down during maintenance without notifying field or station staff.
- Fire incident is in an area that is not covered by current radio communications.
- New generation of radios were assigned to fire incident; COML and incident techs had difficulties getting equipment to work properly.
- T-1 lines went down, impacting radio and computer communication at the ranger district.

Equipment – 22 %

Examples of equipment submissions include the following.

- Two crew members had tape wrapped around and holding their boots together.
- A FF was on the line without a fire shelter; this was a local FF and they carried their shelters in their vehicles.

- A heavy engine was moving at highway speed when the front driveline came off. Other private vehicles hit drive line as it was in the road.
- Exhaust regeneration was required on an engine; this meant that vehicle operations were shut down. This shut down the PTO pump; the hose lay operation.
- The bracket holding the spare tire up came loose, which could have caused the tire to fall from beneath the truck.
- Ford F-350 experienced 'death wobble' (front wheels shimmy back and forth) causing driver to slow down and pull over. Wobble only happens when going over large frost bumps at highway speeds.
- Half the chain saws on a fire (14 out of 28) became non-operative during the first work shift.
- Rear wheels separated from an engine and struck a private vehicle.
- Shut down relays on new pump units are failing causing the pump to shut down during operations.
- Incorrect tire size found on type 4 engine.
- Type 6 engine was having continuous mechanical problems, in and out of the shop, throughout the season.
- Radio starter kit was preordered for an incident, it showed up 3 days late.
- Ground resources and IC unable to reach air attack because of wrong frequencies.
- Hard hats on an Rx fire were removed from service due to questions about the hats meeting safety standards.
- A Type 6 engine lost power while working on a fire. Firefighters burned around the engine and the fire passed by.

<u>Environmental – 13%</u>

Listed below are examples of SAFENETs that identified environmental conditions as a contributing factor.

- Crew was working a fire on a hillside. A large rock was loosened above, rolled and hit a firefighter; FF hospitalized with broken leg.
- Firefighters were possibly exposed to Cyanide.
- Human fecal matter on fire tools/equipment.
- FF picks up rattlesnake, and is bitten.
- Chase truck hit by lightning; the truck was then towed to shop improperly by the towing company; truck had significant damage.

<u>Fire Behavior – 13%</u>

A small number of SAFENETs identified fire behavior as a contributing factor. Identified below are examples.

- Fire made a rapid run and compromised planned escape route for crew equipment.
- Test fire at an Rx burn was hotter and more active than anticipated. Because of the higher than expected fire behavior, firefighters were temporarily trapped and could not move to other parts of the fire.

Other – 11%

- Non agency people were driving in a fire area at high speeds.
- A city FF initially came down with heat illness and dehydration. Further examination diagnosed Rhabdomyolysis. The FF was from a mid-west department working out west to get experience with wildland fires.
- Engine identifiers are similar and can cause confusion for dispatching offices.
- FF developed Rhabdomyolysis while taking WCT.

## Contributing Factor Trends

The SAFENET program has been operational since 2000 and the information included in these reports identifies trends regarding health and safety issues. For most years human factors and communications have been the two leading categories for SAFENET reports. As was mentioned earlier this trend continues in 2011.

In communications, there are issues with hardware (repeaters, handhelds), frequencies, and tone lock codes out for non-federal radios. After falling as a percentage in contributing factors for 4 years, this category increased from 24% in 2010 to 48% this year. This increase in percentage is based more on other factors going down in numbers, especially human factors, and the communications numbers staying about the same, 58 reports in 2010 and 56 in 2011.

Human factors are consistently among the top two contributing factors for SAFENETs submitted. This category saw a significant drop in numbers this year, going from 65 in 2010 to 51 in 2011. Because human factors include both individual and group behavior, it is one of the most difficult of the factors to address. More than other areas, this group of factors highlights the dynamic interaction of people and the work environment.

The number of reports listing equipment as a factor dropped significantly, from 47 in 2010 to 26 in 2011. This marks the second consecutive year of decreases for this category.

Environmental was another area that saw a significant decrease, going from 26 in 2010 to 15 in 2011. Fire behavior and environment factors are often listed together on SAFENET reports.

One geographic region that saw an increase in fire activity and SAFENET reports was the Southwest. Besides Arizona and New Mexico, Federal firefighters assigned to fires in Texas reported concerns with coordination, leadership and situational awareness when working with some of the volunteer and rural fire departments in Texas.

## SAFENET Field Card

2011 saw the introduction of the SAFENET Field card. The Field Card is a hard copy style SAFENET to be used by firefighters for prompt reporting of safety and health concerns on wildland fire assignments, all hazard operations, or other related work environments. This process augments, but does not replace the existing SAFENET system.

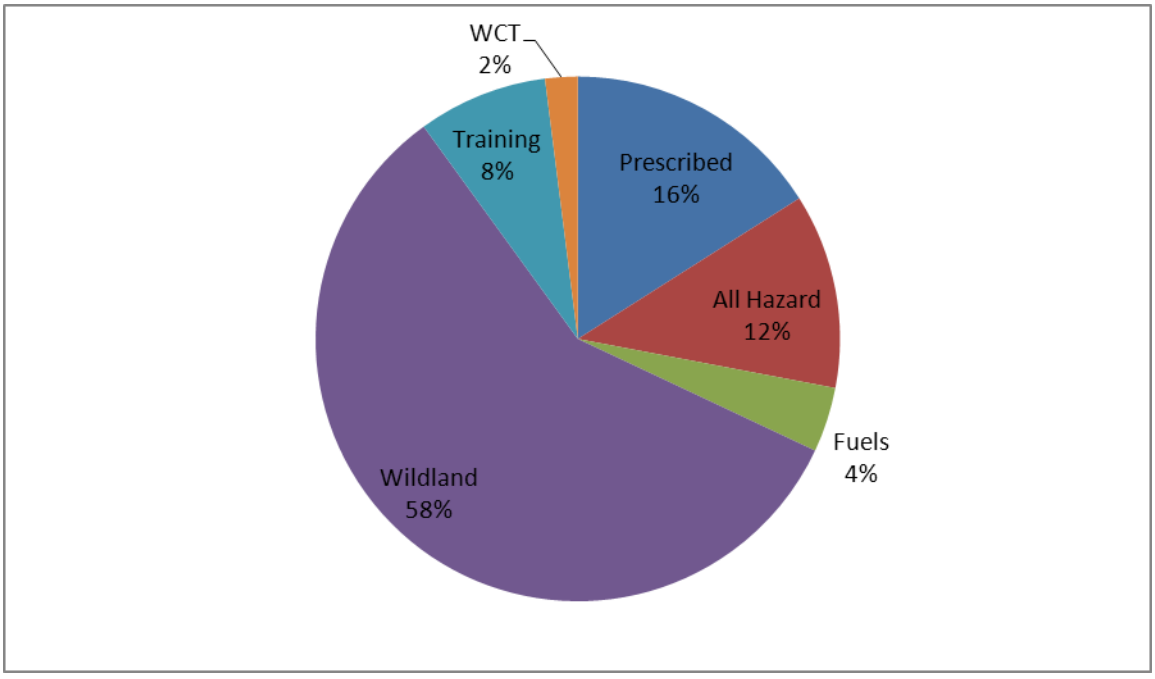
Local units and IMTs are encouraged to make SAFENET Field Cards available for use in areas such as warehouses, crew quarters, food and shower units and briefing areas. A collection process like SAFENET boxes should be established and checked daily. Leadership should address SAFENET Field Card issues at daily briefings, or sooner as the situation dictates.

A completed SAFENET Field Card can also be submitted to an IMT Safety Officer, Incident Commander, or other designated person on fire assignments. At the local unit level, a first level supervisor, a designated safety and health representative, Fire Management Officer, or Agency Administrator can review the field card. Recipients of the Field Card are encouraged to address situations immediately. After the situation has been resolved at the local level, the SAFENET Field Card can be mailed, faxed, or scanned and e-mailed to the SAFENET Administrator.

There were 3 Field Card SAFENET reports that were submitted to the national Office this year. The submission of Field cards to the National Office is voluntary and this could be the cause of the low number of submissions. Field cards are intended for local or incident level use. Field cards are a new option for the wildland fire community and the procedures may not be well known.

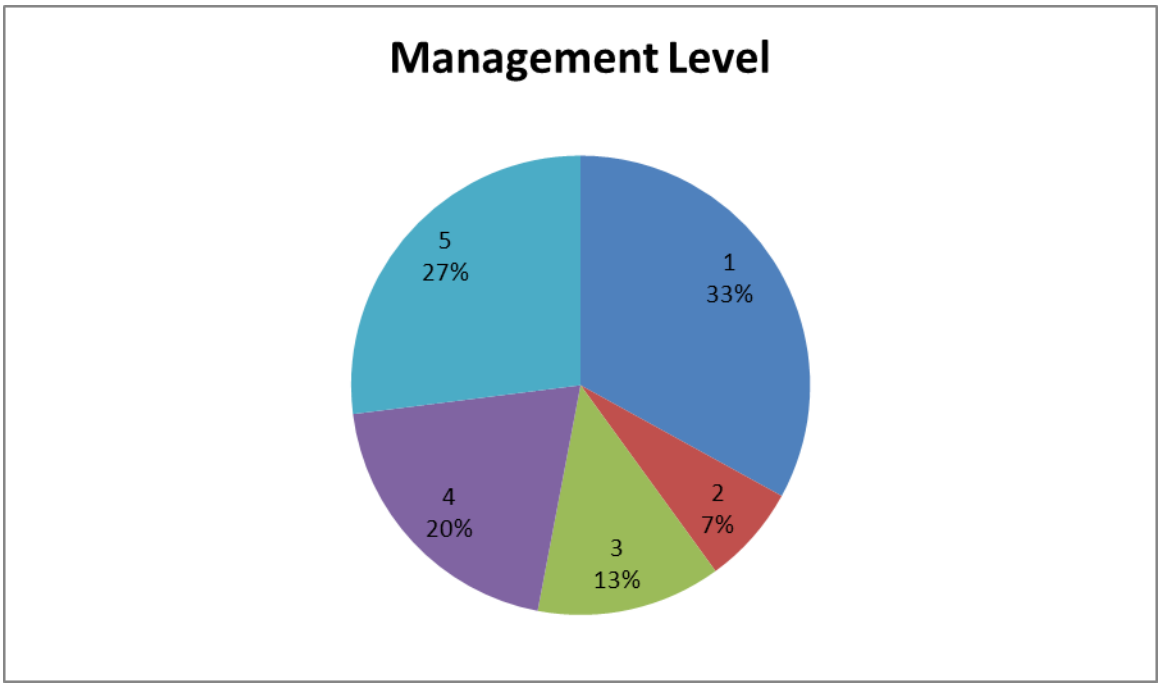
## Incident Type

SAFENET reports allow the person to identify which type of incident they are reporting on. The following pie chart identifies the percentage of incident types for 2011. These percentages have remained relative stable for the past 4 years. The number of SAFENETS submitted for prescribed fires and fuels treatment combined (20% this year) show a small decrease in 2011, after trending upward in recent years.



## Management Level

In 2011 Type 1 incidents had the highest number of reports by management level. This is the second year of an uptick in Type 1 numbers. But it should be noted that Type 4 and Type 5 incidents were also at relatively high percentages. After trending upward since 2007, the 2011 numbers show a small decrease in reports from Type 4 and 5 fires. Together these numbers highlight the important message that all incidents, regardless of size or management organization, can have safety and health issues.

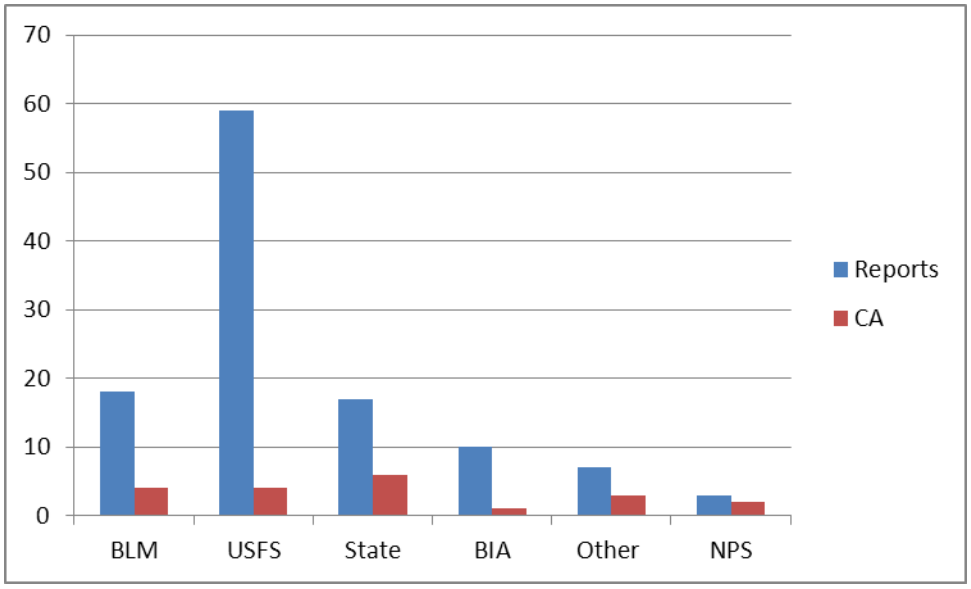


## Corrective Action

SAFENETs are forwarded to the jurisdictional agency listed in the submission and it is their responsibility to respond and provide any Supplemental Corrective Actions (CA) as warranted. These CAs are follow-ups to those SAFENETs that may not be fully addressed in the field, and require higher level action and coordination.

The following chart identifies the number of SAFENET reports received by the agency of jurisdiction, along with the number of Supplemental CAs taken by that agency in 2011.

### Corrective Actions by Agency Jurisdiction in 2011




As a percnetage of reports filed by agency, the agencies provided Supplemenatl Corrective Actions as follows: BLM – 22%, USFS – 7%, State – 35%, BIA – 10%, Other – 43%, and NPS 66%.

## Unpublished SAFENETs

Each year some SAFENETs that are submitted are not posted to the public website because they do not meet the establsihed criteria for SAFENET submittals. The posting criteria is avaialble on the SAFENET website (http://safenet.gov) under SAFENET protocols.

If submittals do not meet the posting criteria, they will not be published or included in the SAFENET database. Questionable submittals are referred to the Federal Fire and Aviation Safety Team (FFAST) members, and Natioanl Association of State Foresterrs Fire Directors as needed, who manage the day-to-day operations, and quality control of the SAFENET program.

In 2011 there were 9 SAFENETs that were not posted. Of these, 6 were submitted by law enfrocement (LE) personel and dealt with LE issues. The remaining three, did not meet the posting criteria.

## Summary

The SAFENET system is the interagency wildland fire mechanism for firefighters on the ground to report “near miss”, or “close call” occurrences and any other safety or health issues related to wildland fire. The SAFENET program was developed as a method for reporting and resolving health and safety concerns encountered by wildland fire personnel. It provides the opportunity to detect “weak signals”, early warning signs of dangerous conditions and actions. This is essential to safety and risk management programs so that corrective actions and other hazard mitigation measures can be taken before more serious incidents occur. The data is important in identifying trends that are utilized by the Risk Management Committee to establish safety prevention programs and emphasis areas.

The SAFENET system continues to provide a valuable link between upper level management and the firefighters in the field. Wildland firefighters are strongly encouraged to continue submitting SAFENETs on safety and health issues as they encounter them.

The SAFENET system does not replace the accident/injury reporting system used by specific agencies. Firefighter injuries and property damage should still be reported through the respective agency processes.

## Appendix A

For reference purposes, a list of incidents on which SAFENETs were filed for the 2011 season is provided below. *Note:* The incident name was not included in all the SAFENETs that were submitted.

**Wildland Fires**

| | |
|---|---|
| Tanner | Stone Creek (2) |
| July Cover | Cactus Mountain |
| West Texas | Canyon |
| White | Figueroa |
| Cascade Complex | Cane Brake |
| Dry Creek | High Creek Fire |
| Poeville | Lion |
| Las Conchas (2) | Pass |
| Bear (2) | Avalanche Butte (2) |
| Miller | 439 Fire |
| Cooper Mountain Ranch (2) | Purple Cliffs |
| Grindstone | Clay |
| Crater Butte | Eagle |
| Christnick | Hill |
| Canyon Creek | Gulch |
| Blair | Bunny Hill |
| Toms Canyon | Mayhill |
| Bear peak | Shingle |
| Goody | Pine |
| Donaldson | Orphir |
| Monument (3) | Beasley |
| Wallow (4) | Lake Roberts |
| Chandler River | Fish Slough |
| Turn Pike | Honey Girl |
| Hastings | Horse Shoe 2 (2) |
| Jackson | Seven Canyon |
| Barrel Creek | Laguna |
| Winchester | Kosciusko |
| Hurricane Complex | Mint (2) |
| Oil Pad Complex | 264 Fire |
| Miller | Nation |

**Prescribed Fires**

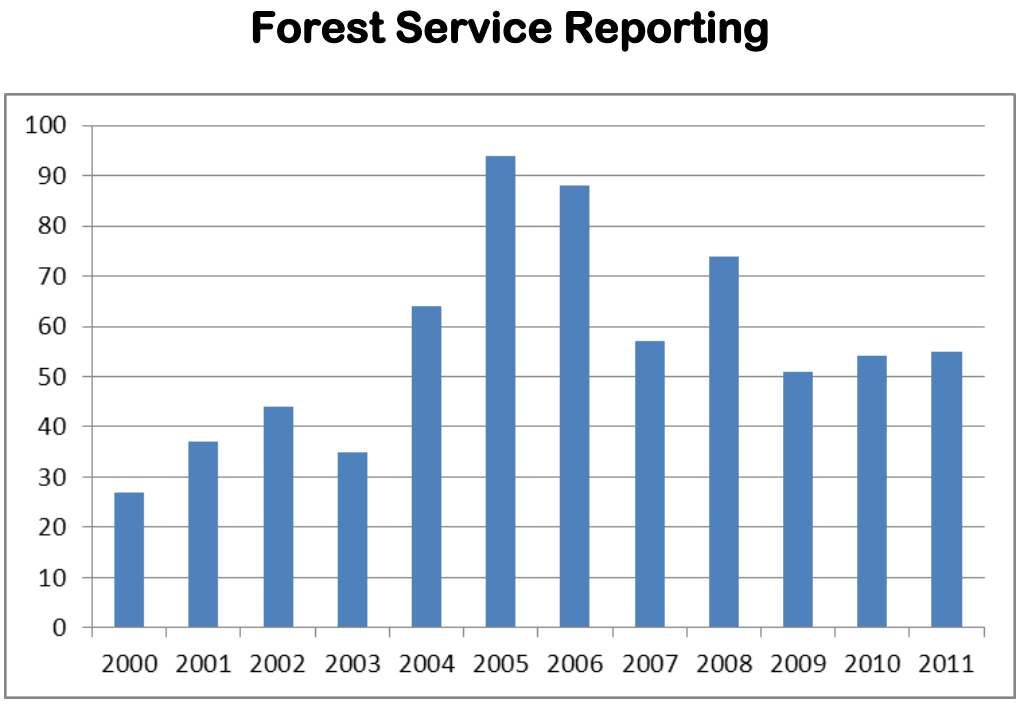
| | |
|---|---|
| Professor Rx | Anderson Rx |
| Valet Rx | Jarvis Creek Rx |
| Pleasant Valley Rx | |

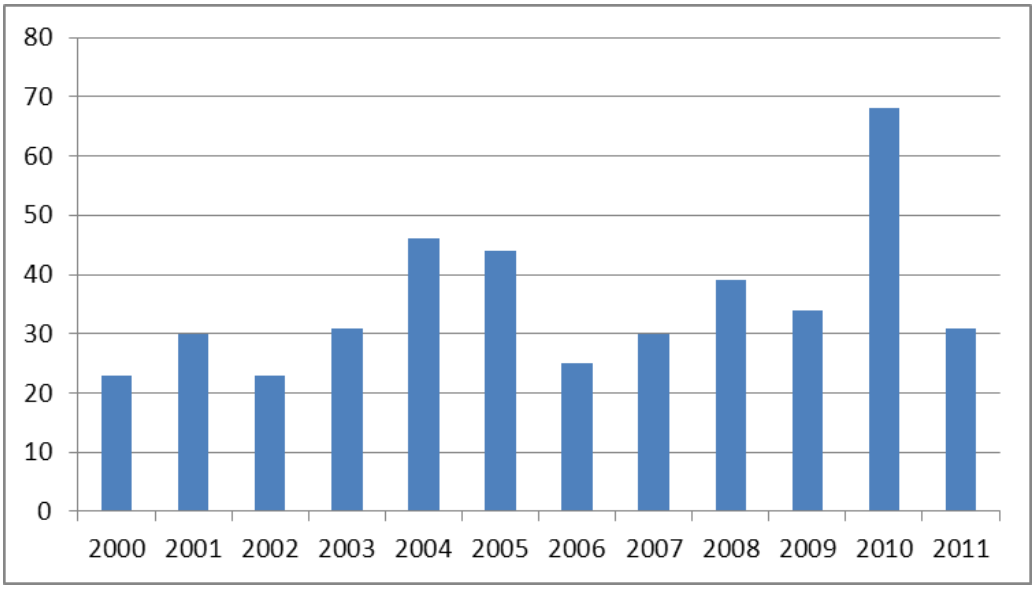
**All Hazard, Training, & Other Incidents**

| | |
|---|---|
| Rhabdo Diagnosis | N5S Readiness |
| Red Flag Warning | UNK |
| Radio Use | None Incident |
| Unsafe Driver | FS Corral repeater |
| Helena Dispatch Center | Pecos District Severity |
| Tuttle Medical Aid | Preparedness |
| Dispatch Preparedness | 423 Lost Dual |
| Non Incident | Engine Identifier |
| Fire Staffing | |

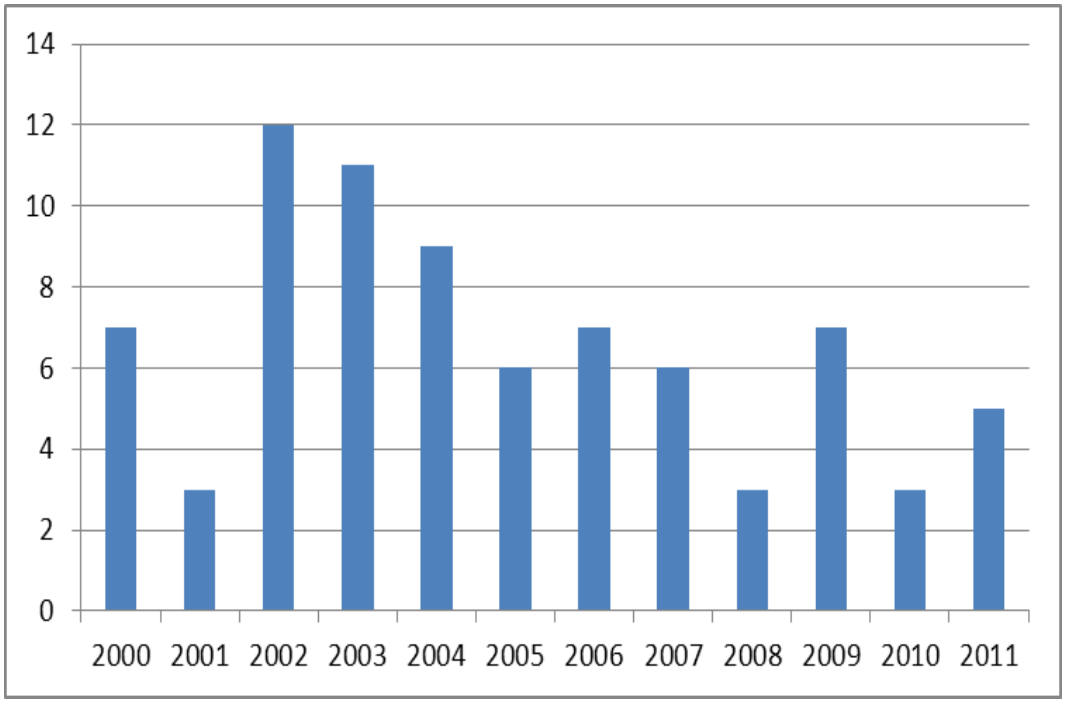
## Appendix B

### Reports by Agency 2000 to 2011

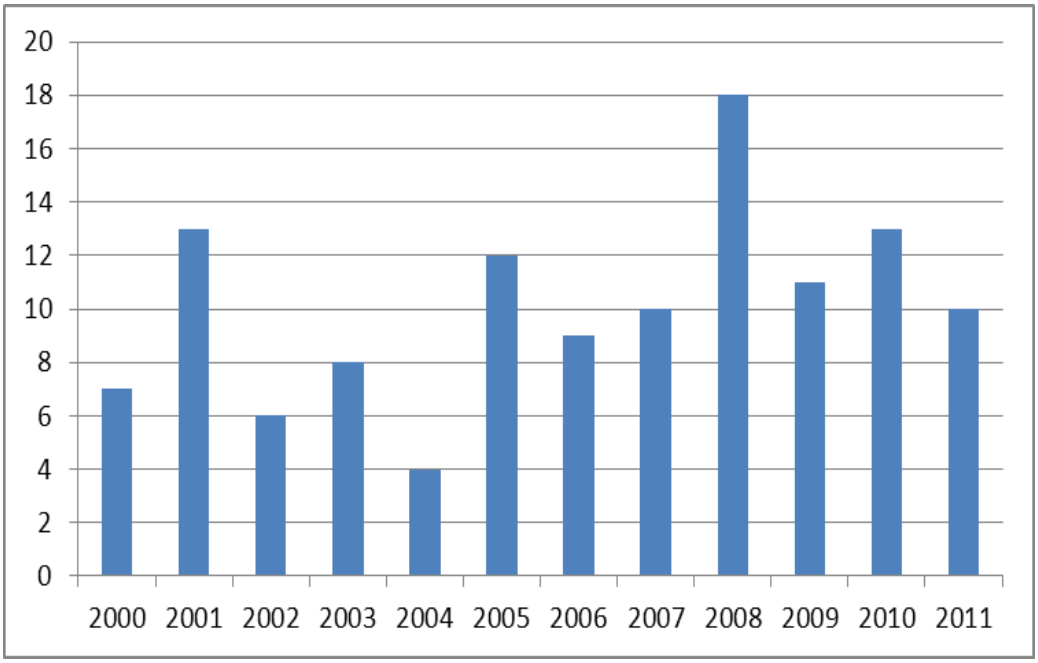


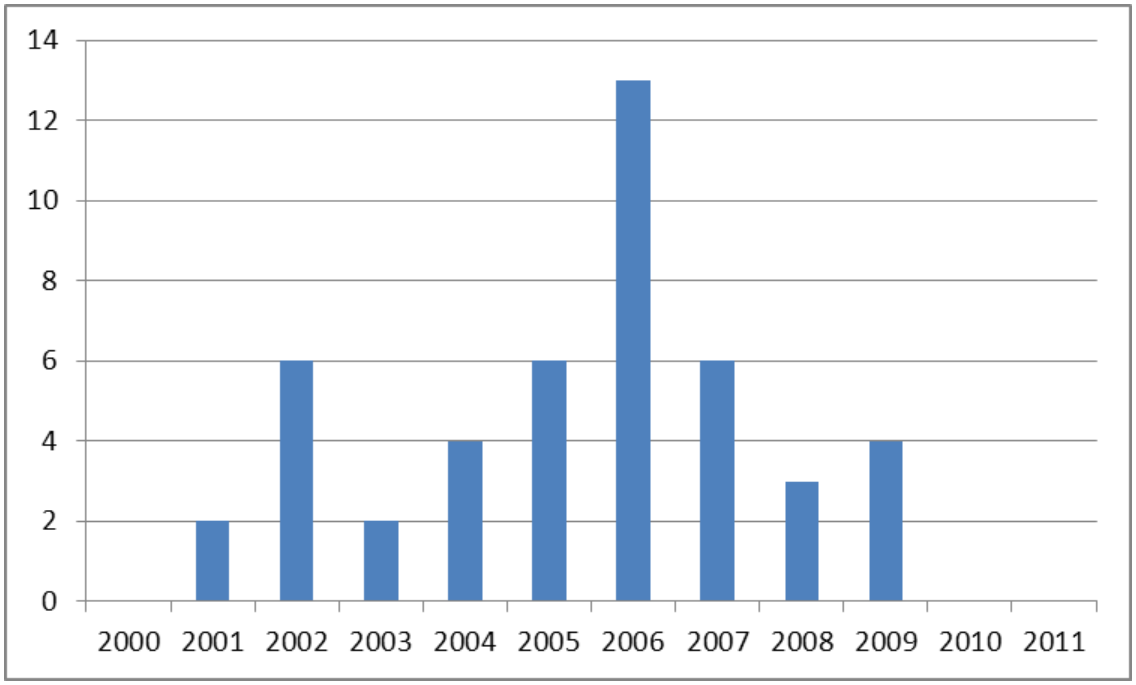
## NPS Reporting



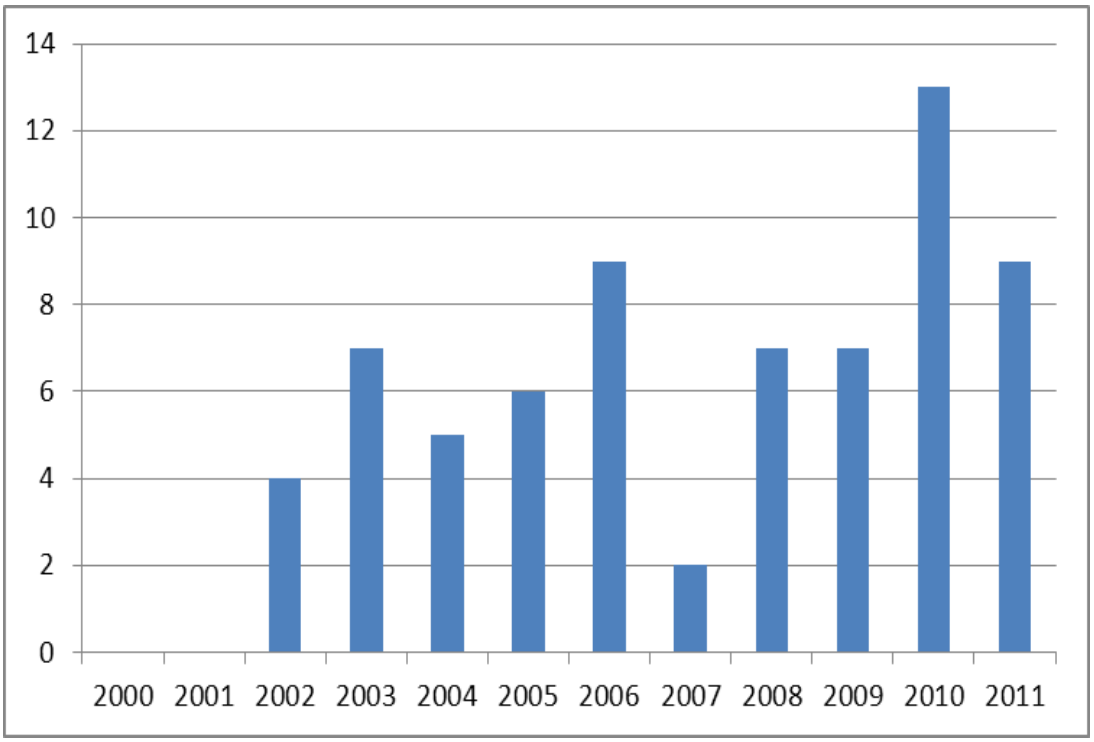

## BIA Reporting



## FWS Reporting




## State Reporting



# Other Reporting