



## Georgia Department of Audits and Accounts Performance Audit Division

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### Why we did this review

The Georgia Forestry Commission (GFC) Forest Protection program was established to prevent and suppress wildfires, recommend best practices to government officials, and assist landowners with forest protection. We conducted this audit to determine whether GFC (1) is adequately prepared for wildfire seasons of all severity levels; (2) has allocated existing Forest Protection resources to areas with the highest need; and (3) has evaluated the effectiveness of wildfire prevention, mitigation, and suppression activities at reducing the number and size of wildfires.

### About GFC

To achieve its mission, GFC Forest Protection responds to all wildfires, assists private landowners with mitigation activities (e.g., prescribed burning), provides aerial detection of wildfires, and conducts community outreach and education to prevent wildfires. GFC also provides equipment and training to county and municipal rural fire departments, provides fire weather forecasting, and oversees burn permits.

GFC Forest Protection is organized into two zones and 10 areas. Within the areas, counties are grouped into one of 77 county-units, each with three to seven rangers who respond to wildfires and conduct prevention and mitigation activities.

In fiscal year 2020, GFC Forest Protection expenditures totaled approximately \$40 million.

## GFC Forest Protection

### Action needed to ensure continued success in suppressing wildfires

#### What we found

Historically, the Georgia Forestry Commission (GFC) Forest Protection program has successfully suppressed wildfires before they exceed five acres in size. However, there are risks to GFC's future success resulting from lack of wildfire experience among rangers, gaps in statewide guidance for mitigation and suppression activities, and the need for better information to determine the number of resources GFC needs and how best to allocate them.

#### GFC has successfully suppressed wildfires.

Between fiscal years 2015 and 2019, approximately 82% (13,800) of the nearly 17,000 wildfires within the state were suppressed before exceeding five acres, which is GFC's goal. GFC has been able to achieve this primarily due to its resources (personnel and equipment) and prevention and mitigation activities, as well as a lack of recent severe wildfire seasons.

#### A majority of GFC rangers have not experienced a severe wildfire season.

Approximately 58% of GFC's rangers have been hired since Georgia's last severe wildfire season in fiscal year 2011. Exposure to wildfires increases rangers' understanding of their behavior and how to effectively suppress them. Opportunities exist to mitigate the risks associated with this lack of wildfire experience, including formally tracking rangers' wildfire experience, conducting training exercises, and developing formal succession plans for field management positions.

#### Risk could be reduced through more comprehensive planning.

GFC central office has generally not undertaken comprehensive planning that would help ensure more consistency across the

county-units and assist with resource allocation. This comprehensive planning would help ensure GFC has continued success fighting wildfires in a number of ways. Specific areas include:

- **Aviation** – GFC has not created a plan defining what the aviation program is expected to accomplish or how its resources are to be used. As a result, it is difficult to determine the number and types of aviation resources required for GFC's fleet. This is particularly important because several aircraft are aging, and management must determine whether and how to replace them. There is also no formal guidance on when aviation should be utilized to respond to wildfires, and we identified variation among county-units' use of these resources. More comprehensive planning can help ensure GFC has the right types and number of aircraft to detect and suppress wildfires.
- **Staffing** – Opportunities exist to better align GFC personnel distribution with wildfire risk and suppression and mitigation work. Current staffing allocation results in significant variation in workload across county-units. Adjustments to county-unit assignments are made only as retirements and resignations occur. A long-term staffing plan could better ensure staffing aligns with risk and workload, and that any variations are due to valid reasons.
- **Establishing priorities and monitoring objectives** – While GFC has adopted local plans for wildfire protection, it is necessary for some aspects of planning to occur at the state level. Other states have developed plans that prioritize projects across the state, assign responsibility to various parties, and monitor progress on completing objectives. Furthermore, our review of local Community Wildfire Protection Plans found gaps when compared to federal guidance. Gaps include lack of detailed, area-specific information on critical infrastructure, unique fuel loads, local capacity, and needed mitigation projects.

**More comprehensive data would provide better management information for decision-making.**

GFC collects a substantial amount of data, and there are opportunities to build upon this to create better management information. For example, while GFC collects data on total flights and wildfires reported for its aviation fleet, other data points (such as such as fire class day, suppression utilization, and use of non-GFC assets to fight wildfires) and increased data integrity would assist in evaluating the need for aviation assets. Likewise, an inventory of ranger experience and qualifications would help central office and county-units prioritize who needs additional training or may benefit from increased exposure to wildfire. Finally, GFC could use quantitative risk analysis, such as when the Southern Wildfire Risk Assessment is updated, to evaluate the effectiveness of mitigation activities and inform future mitigation planning.

## **What we recommend**

We recommend that GFC create a plan to address the risk associated with rangers' lack of experience with large wildfires. This includes tracking personnel wildfire experience, determining types of Incident Management Teams needed, creating policies for after-action reviews, and developing wildfire training exercises.

We also recommend GFC create statewide guidance regarding the use of aviation resources, staffing allocations, and mitigation and prevention activities. GFC should also track additional aviation data points and use quantitative risk analysis to evaluate mitigation and prevention activities.

See [Appendix A](#) for a detailed listing of recommendations.

*Agency Response:* GFC generally agreed with our recommendations. Specific responses and a timeline for implementing changes are included at the end of each relevant finding.

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## Purpose of the Audit

This audit examines operations of the Georgia Forestry Commission (GFC) with a focus on the Forest Protection program. The audit set out to determine whether:

1. GFC is adequately prepared for wildfire seasons of all severity levels;
2. GFC has allocated existing Forest Protection resources to areas with the highest need; and
3. GFC has evaluated the effectiveness of wildfire prevention, mitigation, and suppression activities at reducing the number and size of wildfires.

A description of the objectives, scope, and methodology used in this review is included in [Appendix B](#). A draft of the report was provided to the Georgia Forestry Commission for its review, and pertinent responses were incorporated into the report.

## Background

### Georgia Forestry Commission

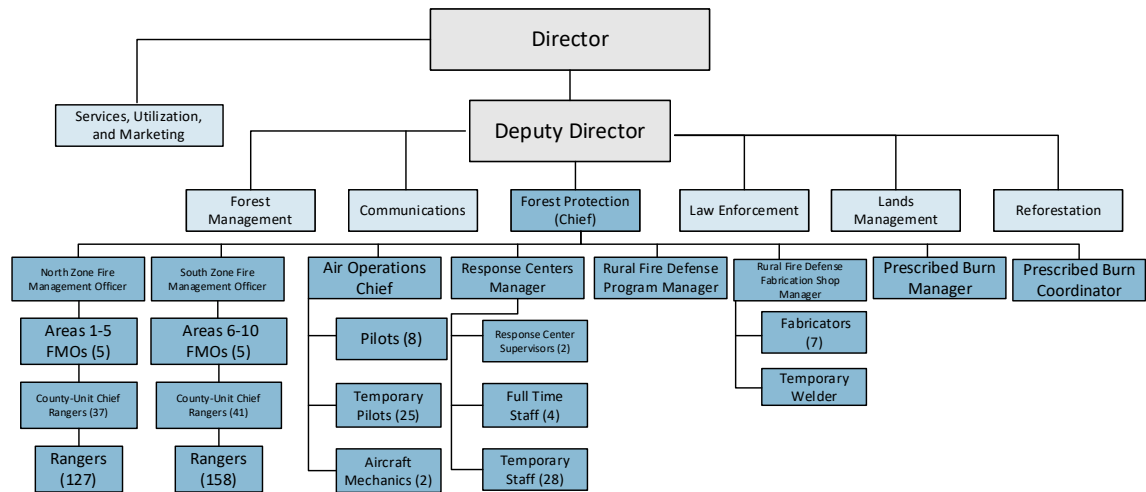
The Georgia Forestry Commission (GFC) was created in 1949 to protect Georgia's 24 million acres of forestland by preventing and suppressing wildfires, recommending best practices to government officials, and assisting landowners with forest protection. GFC's official mission statement is "to provide leadership, service, and education in the protection and conservation of Georgia's forest resources."

### GFC Organization

GFC is governed by a seven-member board composed of citizens appointed by the governor and confirmed by the senate. The board consists of four members who own or represent an owner of at least 50 acres of Georgia forestland, two members who are or represent manufacturers of forest products, and one member who is not in either identified group. Members serve seven-year terms. The board, with the governor's consent, appoints a director who serves as the commission's executive secretary and administrative officer until removed by the commission.

As shown in **Exhibit 1**, GFC has six program areas: Forest Protection, Forest Management, Communications, Law Enforcement, Lands Management, and Reforestation. This report focuses on the Forest Protection program and its functions.

## Exhibit 1 GFC Organizational Chart



Source: GFC organization chart

### Forest Protection

The mission of the Forest Protection program is to detect, prevent, and suppress wildfires. This is accomplished through a variety of activities, which the Forest Protection chief stated should be prioritized as follows (see Exhibit 2):

1. **Fire Control** – Respond to, contain, prevent, and suppress wildfires. On high fire risk days, maintain response preparedness. Check fire control equipment and perform any required maintenance.
2. **Emergency Management Response** – As part of the state's emergency management response, assist in the preparedness and aftermath of natural disasters such as tornados, floods, and hurricanes.
3. **Private Lands Service** – Perform services on private lands, including prescribed burn assistance and fire break installations. Services rendered on a first-come, first serve basis based on weather conditions and landowner availability.
4. **Public Lands Service** – Perform similar services on public lands.
5. **Support of Other GFC Programs and Other State Entities** – Assist GFC foresters with other forest management and reforestation activities. Support other state entities (e.g., Department of Natural Resources). Perform community outreach and engagement.
6. **Training and Routine Maintenance** – Complete annual mandatory trainings. Perform routine (e.g., painting, repairs) on GFC offices and other structures.

## Exhibit 2 Forest Protection's First Priority is Fire Control



Source: GFC

GFC's Forest Protection program has approximately 400 full-time staff, the majority of which work in the field as rangers dedicated to fire management. There are also several specialized support units. Each area is described below.

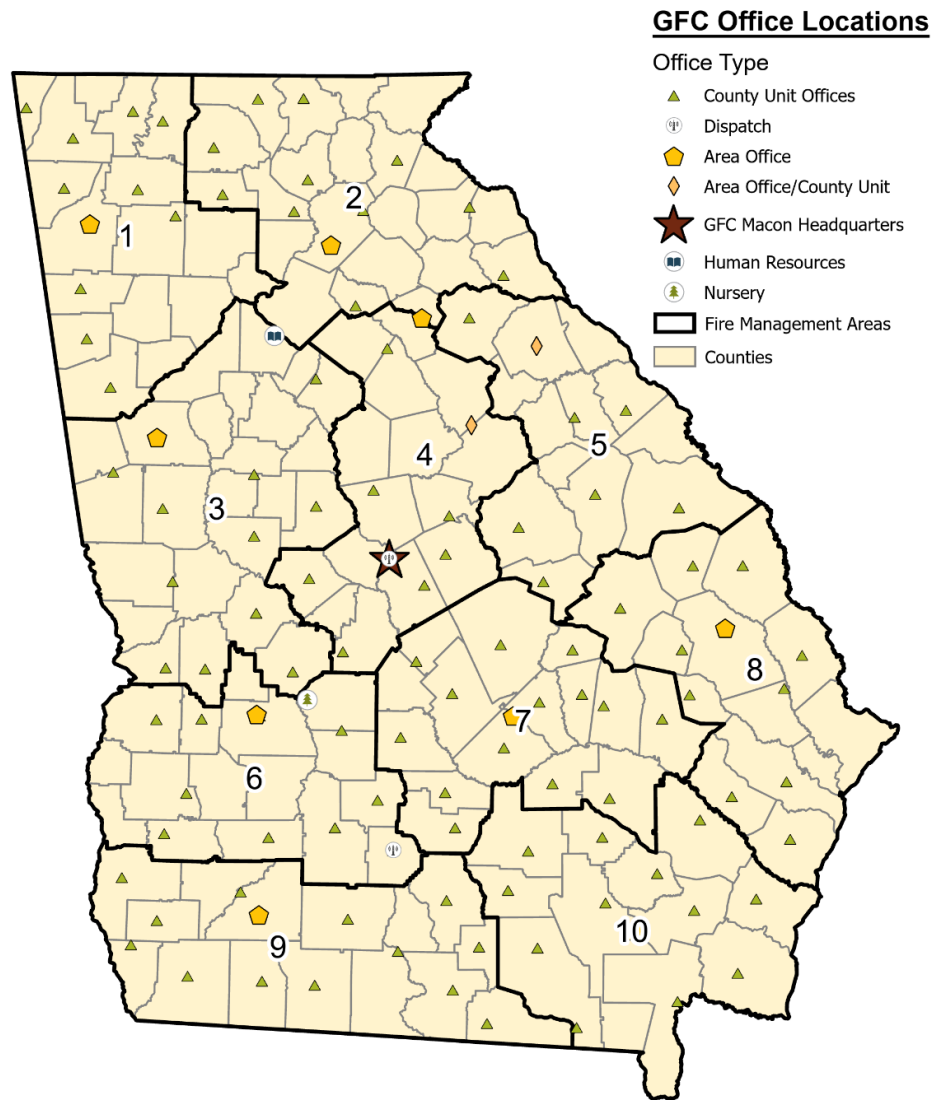
### Fire Management

GFC has divided the state into zones, areas, and county-units for field operations, as shown in Exhibit 3 and described below.

- **Fire Management Zones** – Fire Management is split into two Fire Management Zones, North and South, each consisting of five Fire Management Areas. Each zone is led by a Zone Fire Management Officer (FMO) who is responsible for all fire control within their zone and works with the fire chief and other unit managers to distribute resources.
- **Fire Management Areas** – The 10 Fire Management Areas range in size from 3.2 to 4.8 million acres and have six to 10 county-units. Area FMOs report directly to the Zone FMOs. The Area FMOs are responsible for the accounting and budgeting functions for their county-units, allocating resources to their county-units, overseeing the work of chief rangers and their rangers, and attending regular meetings with local elected officials.
- **Fire Management County-Units** – Each of the 77 county-units is overseen by a chief ranger who reports directly to the Area FMO. The chief rangers oversee approximately 300 rangers dispersed across the state. Rangers are responsible for initial wildfire suppression, as well as mitigation and prevention activities. Rangers must obtain a CDL and learn how to operate and maintain heavy machinery, in addition to achieving wildland firefighter certification.

Historically, there was a county-unit for each county, but these have merged over time to now serve one to five counties. Each county-unit is typically staffed with three to seven rangers; however, during periods of low fire risk, one ranger may cover multiple county-units. Some county-units have multiple offices, depending on the geography of the county-unit and offices remaining after county-unit consolidations. Currently there are 109 county-unit offices.

### Exhibit 3 Fire Management Offices are Dispersed Throughout the State



Source: DOAA analysis of GFC data

#### Specialized Units

In addition to field operations, GFC dedicates staff to several specialized units that provide support to Forest Protection, as described below.

- **Aviation** – The Aviation Operations unit performs surveillance flights to detect wildfires, provides overwatch support to rangers engaged in wildfire



fighting, and assists with wildfire suppression. Aircraft are primarily used for Forest Protection but are also used by Forest Management and other state agencies, including the Georgia Emergency Management Agency (GEMA) and the Department of Natural Resources (DNR). The aviation unit currently has eight full-time pilots, as well as 25 temporary pilots.

- **Prescribed Burn Management** – This program includes prescribed burn certification, burn permits, and smoke management. The program manager conducts prescribed burn certification training three to five times per year. This certification is required for GFC personnel who will be in charge of a prescribed burn assistance service for private landowners and is recommended for private landowners who conduct their own prescribed burning.
- **Response Centers (Dispatch)** – GFC operates two response centers: one 24-hour center in Macon and another in Tifton that is operational from 7 a.m. to 7 p.m. Both are dispatch centers that receive wildfire reports and page the nearest county unit to respond.<sup>1</sup> Dispatchers track all information related to wildfire incidents from dispatch to arrival to suppression. Personnel at the centers also aid the aviation unit through live aircraft tracking and surveillance and assist with prescribed burning permits. There are currently seven full-time staff and 28 temporary staff (primarily dispatchers).

## Partnerships

GFC's Forest Protection program works with a variety of partners—including other state agencies, federal entities, local entities, and other states—to share resources during emergency wildfire events.

### Federal Agencies

GFC has an MOU with federal land management agencies, including the U.S. Forest Service, National Park Service, and the U.S. Fish and Wildlife Service, which allows GFC to engage in wildfire fighting on federal property and request wildfire assistance from these agencies. This includes both personnel and equipment.

### State Agencies

GFC Forest Protection works closely with the DNR, GEMA, and the Georgia State Patrol (GSP). GFC assists with prescribed burns, among other activities, on state-owned land managed by DNR. In addition, GSP and DNR provide support when needed, including aviation resources. GFC also works with GEMA as part of the emergency management incident command for emergencies impacting Georgia, such as hurricanes or, more recently, COVID-19.

### Other States

Georgia is part of the Southeast Interstate Forest Fire Compact, which also includes Alabama, Florida, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia. The purpose of this compact is to promote effective prevention and control of forest fires by developing integrated forest fire plans, maintaining adequate forest fire fighting services, and providing mutual aid when

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<sup>1</sup> Reports of wildfire activity come through various sources, including 911 and GFC county unit offices.

fighting forest fires. Georgia may request or provide assistances to other compact members. The state requesting assistance must reimburse the “sender” based on the agreed-upon rates.

GFC also works with other states’ forest agencies to respond to major wildfires throughout the country. When other states request assistance, available GFC rangers can volunteer to supplement their crews. For example, GFC deployed rangers to California in 2020 to assist with wildfire response during their severe season. While out-of-state, GFC rangers’ salaries and overtime are paid by the requesting state.

### Rural Fire Departments

GFC assists rural fire departments by providing equipment through the Rural Fire Department (RFD) program, as well as through the federal excess equipment program. In turn, rural fire departments must make such equipment available for use to fight wildfires. Rural fire departments are often the first on scene of a wildfire and often extinguish those that are small and close to a roadway. The RFD program manager also administers the federal Volunteer Fire Assistance grant.<sup>2</sup>

### Financial Information

The Forest Protection program comprises the majority of GFC’s expenditures each year—ranging from between 71% and 80% between fiscal years 2017 and 2020. In fiscal year 2020, Forest Protection expenditures totaled approximately \$40.3 million.

As shown in **Exhibit 4**, Forest Protection program expenditures have fluctuated over the past four fiscal years, ultimately decreasing by 22% since fiscal year 2017. This is primarily due to changes in state appropriations, which make up most of the Forest Protection budget (between 62% and 76%). GFC supplements state funding by charging fees for its services (e.g., landowner services) and applying for federal grants<sup>3</sup>. It should be noted that Forest Protection program expenditures include expenditures for GFC law enforcement, public relations, and rural fire defense.

### Exhibit 4

#### Forest Protection Expenditures by Fund Source, FY 2017-2020

Fund Source	2017	2018	2019	2020
<b>State</b>	\$39,690,000	\$33,670,000	\$37,864,000	\$29,617,000
<b>Federal</b>	\$3,167,000	\$7,845,000	\$4,692,000	\$2,357,000
<b>Other</b>	\$9,448,000	\$12,657,000	\$7,642,000	\$8,349,000
<b>Total</b>	\$52,306,000	\$54,171,000	\$50,198,000	\$40,324,000

Source: TeamWorks

<sup>2</sup> This grant typically provides \$250,000 in annual awards, given out as part of a 50% match program for the rural fire departments.

<sup>3</sup> Federal grants fund volunteer fire assistance for rural fire departments, prescribed burning adjacent to National Forests, emergency disaster assistance, and community fire protection grants. States can also apply for fire management assistance grant programs through FEMA when destruction from a wildfire constitutes a major disaster, such as the 2017 Okefenokee Swamp fire.

## Findings and Recommendations

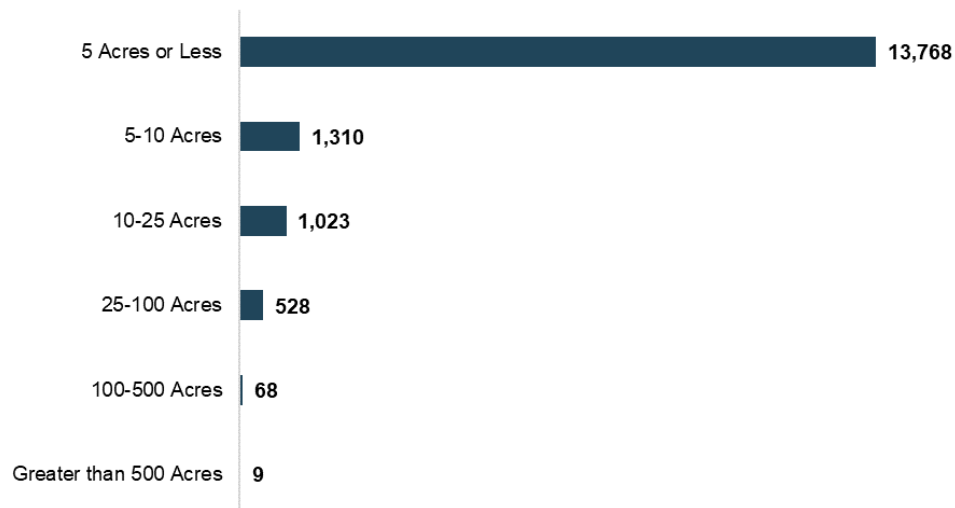
### Finding 1: Historically, GFC has successfully suppressed wildfires in Georgia.

Between fiscal years 2015 and 2019, GFC suppressed the majority of wildfires before they surpassed its stated goal of less than five acres. This is primarily due to its staffing and aviation resources, mitigation and prevention activities, and a lack of recent severe wildfire seasons.

Due to the amount of private forested lands, GFC seeks to contain and suppress wildfires as quickly as possible to minimize property damage. As shown in **Exhibit 5**, during a five-year period<sup>4</sup> approximately 82% (13,800) of the nearly 17,000 wildfires within the state were suppressed before exceeding the GFC-established goal of five acres. Approximately 90% (15,000) were suppressed before exceeding 10 acres, and only 0.5% (77) exceeded 100 acres.

#### Exhibit 5

#### 82% of Wildfires are Suppressed Before Exceeding Five Acres, FY 2015-2019



Source: DOAA analysis of GFC wildfire data

GFC was able to contain these wildfires with little assistance from the federal government or other states. GFC can request assistance with wildfires from the U.S. Forest Service and other states but rarely does so. GFC has been able to achieve this primarily due to its resources and prevention activities, as described below.

- **Staffing** – GFC employs approximately 360 rangers, which generally aligns with staffing in some neighboring states, including Florida and North Carolina.<sup>5</sup> These wildland firefighters—who are primarily responsible for initial attack on wildfires—are stationed across 77 county-units in 109 offices.

<sup>4</sup> At the time of the analysis, fiscal year 2019 was the last complete fiscal year for which wildfire data was available.

<sup>5</sup> While we reviewed the resources in all contiguous states, GFC stated that Florida and North Carolina were most similar to Georgia with regard to size and forested acres.

As a result, nearly all of Georgia is within 45 minutes of a GFC forest protection office, with a significant portion of the state covered by multiple county-unit offices.

- **Aviation** – GFC currently has enough detection aircraft to patrol each of the 10 Forest Protection Areas every day. In addition, GFC can provide its detection/surveillance aircraft when incident commanders request assistance during a wildfire. Aviation personnel and rangers have both stated that aviation resources are typically available when requested. GFC staff stated they have rarely needed aviation resources from other Georgia state entities or other states.
- **Mitigation and prevention** – GFC engages in a number of mitigation and prevention activities that are consistent with best practices put forth by federal entities and academic research (see [Appendix C](#)). These include conducting prescribed burns, which GFC does on more than 100,000 acres of land annually, and plowing and harrowing approximately 27,000 miles annually, largely on private land to decrease fuel loads and overall risk of wildfires. GFC personnel and data indicate that GFC has been able to complete most private landowner mitigation requests, which can minimize the risk of damages caused by wildfire. GFC also conducts public education campaigns that inform the public of actions they can take to prevent wildfires.

While GFC has been historically effective, we identified risks and areas for improvement that should be addressed to ensure continued success. These will be discussed in further detail throughout the report. Risk and improvement areas include:

- Limited evaluation of resources—including the number and type of aircraft needed (see page 8) and the distribution of rangers (see page 13);
- Lack of ranger wildfire experience, which GFC management indicated is their biggest area of concern (see page 17); and
- Gaps in statewide planning and monitoring regarding mitigation and suppression activities and local plans that generally do not consider area needs (see page 21).

**Finding 2: Additional information should be collected to determine whether GFC has the appropriate number and types of aviation resources.**

GFC's aviation resources are regularly used for detection and suppression activities; however, it is not possible to determine whether it has the appropriate number or type of aircraft to meet the state's needs. To assess the extent to which aging aviation resources should be replaced, GFC should first define what the aviation program is expected to accomplish, provide criteria for when to request the support, and track additional activity data.

The aviation fleet includes 17<sup>6</sup> detection/surveillance aircraft, which enables GFC to patrol each of its 10 Areas every day if necessary. GFC also has two single-engine aerial tankers (SEATs) and one type III utility helicopter (used for suppression and personnel transport). While GFC has fewer helicopters, the remainder of the fleet is similar in size and composition to neighboring southeastern states, including North Carolina and Florida.<sup>7</sup>

GFC primarily utilizes aviation resources for detection, overwatch, and wildfire suppression. For example, incident commanders can request detection/surveillance aircraft during wildfire suppression. Pilots provide updates on wildfire patterns, location of rangers, and other information that can increase situational awareness for the incident commander and rangers. Aircraft may also fly over particular areas to identify wildfires that may not be seen from the ground.

As shown in **Exhibit 6**, there were substantial variations in detection/surveillance flights across the state from fiscal year 2014 to fiscal year 2018. This activity did not always align with risk levels designated for each region.<sup>8</sup> For example, GFC reported a large number of flights in Coosa and Satilla regions, which have higher wildfire risk and more challenging geography. However, the Oconee region—which had the third highest number of flights—is at a low risk for wildfires, further evidenced by the low number of wildfires reported and worked.

The flight activity in **Exhibit 6** further demonstrates that while GFC currently has enough aviation resources to patrol each Area of the state every day, this does not currently occur. Additionally, GFC's new policy to limit flights to Class III<sup>9</sup> or higher days seems to indicate every area every day is not necessary. While Class III designations have not been tracked in the past, it is unlikely that all 10 Areas will need patrols every day. As such, flight activity will likely decrease even further.

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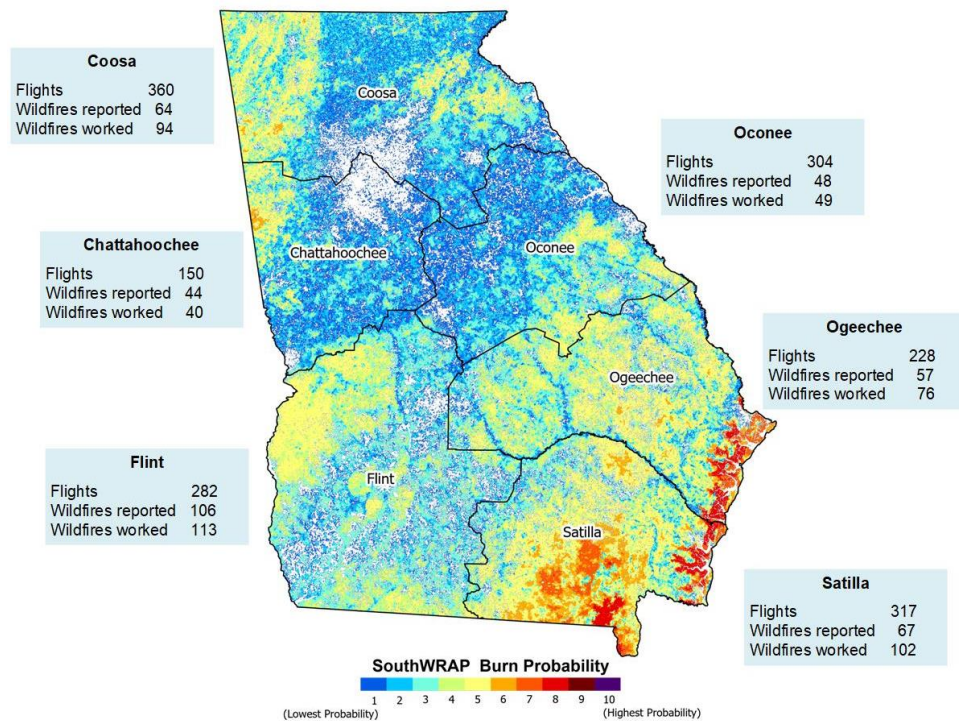
<sup>6</sup> GFC is selling six older aircraft and will replace these with three new aircraft. This will reduce the number of detection aircraft from 17 to 14.

<sup>7</sup> Florida has 20 detection/surveillance aircraft and seven helicopters, while North Carolina has 12 detection/surveillance aircraft, five helicopters, and two SEATs. Florida relies solely on helicopters for suppression, while North Carolina, like Georgia, uses a mix of helicopters and SEATs.

<sup>8</sup> The districts shown on **Exhibit 6** are historical districts. Beginning in fiscal year 2019, GFC switched from 6 districts to 10 areas. The limited number of years since that change makes that data less useful.

<sup>9</sup> Class day describes the potential for wildfires. GFC uses Burning Index (BI) to determine the class day for each local area. Class days range from 1 to 5.

## Exhibit 6 Surveillance/Detection Aircraft Usage Varies Across the State, FY 2014 to 2018



Source: DOAA analysis of GFC aviation data

Additionally, GFC has rarely used its wildfire suppression aircraft in recent years. Since fiscal year 2013, GFC used the Bell helicopter approximately 40 times to work wildfires, however GFC did not begin tracking suppression data in the aviation information system until 2018. GFC acquired its two SEATs in fiscal year 2018 but it is unclear how frequently they have been utilized. As of December 2020, the SEATs have been used to work 31 wildfires; however, the data shows GFC only dropped water during eight of those flights. While this may be due to low wildfire seasons, aviation personnel also expressed concern that rangers do not request aviation support due to the cost.<sup>10</sup>

While activity data can provide some insight into GFC's aviation resources, it is not possible to assess whether GFC has the appropriate number (too much or too little) or type. This is due to the following limitations, many of which could be addressed with a more robust strategic plan for the aviation program.

- GFC has not formally defined what the aviation program is expected to accomplish or how its resources are to be used. The federal Interagency Aviation Management Plans describe aviation needs and how aviation resources will be coordinated in response to area fire concerns, as well as who

<sup>10</sup> It should be noted that GFC must meet flight training hour requirements on these aircraft. There may be opportunities to meet these requirements through increased use on wildfires instead of training missions.

is responsible for evaluating aircraft effectiveness including cost and utilization. Without a plan, it is unclear what GFC expects aviation to achieve overall, what GFC plans to achieve with agency resources, or when GFC expects to use other State of Georgia aviation resources (see below). Formally defining these would help assess potential capability gaps and prioritize missions.

- GFC has not established formal guidance for its rangers regarding when to request aviation resources and what resources to utilize. Guidance is limited to an email on aviation use sent to field personnel in 2018. Requests left up to rangers' discretion can vary based on an individual's assessment of risk, resulting in potential over- or under-utilization of resources. As previously mentioned, GFC personnel expressed concern that some rangers may not call for aerial wildfire suppression support because they believe it is too expensive.
- GFC does not track several data points that would help determine the need and demand for aviation resources. This includes the fire class day<sup>11</sup> for each aviation Area, which would help determine the need for surveillance/detection aircraft. There is also a lack of clarity of what working a wildfire means in the summarized management view of aviation data. For example, it could refer to providing overwatch of an active wildfire or actively suppressing a wildfire with aerial water drops. Additionally, activity related to GFC's new suppression aircraft would help assess how and why they are used, their impact, and whether the number and type are sufficient. For example, tracking qualitative data on the impact of aerial suppression, type of terrain in the area where drops occur, and fire intensity levels would be useful in determining when and where to deploy aerial suppression, and whether to utilize the helicopter, SEATs, or both.
- Aviation data collection could be improved. GFC lacks a purpose-built aviation data management system, which creates challenges with how data is collected and analyzed.<sup>12</sup> The internal data system GFC created to track flights allows needed data fields (such as Areas flown or departure/arrival airport information) to be left blank or entries in the wrong data fields. We also identified inconsistencies in the data, including flights deployed to suppress a wildfire with no corresponding water drops recorded. Enhancements to the existing system such as input controls could reduce data entry errors and ensure data are captured in a manner that can inform management decisions. The Georgia Department of Natural Resources (DNR) utilizes aviation-specific data management systems, which it estimates costs approximately \$10,000 to \$15,000 per year.<sup>13</sup>
- There is limited information on how often GFC uses other aviation resources on wildfires. GFC can utilize Georgia State Patrol, DNR, and National Guard

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<sup>11</sup> Fire class days come from the National Fire Danger Rating System, which is used nationally to predict the likelihood and severity of fire occurrence in specific geographic areas. The class days range from one to five.

<sup>12</sup> A purpose-built aviation data system specifically tracks aviation flight and maintenance data such as aircraft records, flight logs, inspection logs and schedules, and aircraft status.

<sup>13</sup> This includes the CAMP System which is also utilized by the U.S. Forest Service for maintenance tracking, and Digital Airware which is also used by a number of public safety agencies.



helicopters on wildfires, as well as federal resources, but the aviation data system does not collect information on how or when these are utilized (e.g., location, date, purpose of flight, reason for need). Understanding the viability of other state resources—particularly how they could and should be utilized during a severe wildfire season—is essential to assessing the sufficiency of GFC’s own aviation resources.

In fiscal year 2019, GFC spent an estimated \$3 million on aviation operations.<sup>14</sup> Given this cost, it is critical to understand aviation needs, capabilities, and potential gaps—particularly as GFC begins to replace its aging fleet. GFC is in the process of replacing six old aircraft with three newer models, and other aging aircraft will need to be retired in the coming years. It could be that GFC needs to maintain the existing fleet size or there could be opportunities to achieve cost savings through fleet size reduction.

### RECOMMENDATIONS

1. GFC should formally define what the aviation program is expected to accomplish.
2. GFC should create formal guidance regarding when incident commanders should request aerial suppression support.
3. GFC should track data that would allow management to assess activity and need for aviation resources. This may include the fire class day and key qualitative data on aerial wildfire suppression.
4. GFC should track use of external aviation assets in fighting wildfires, including frequency and the response time from request to arrival on scene.
5. GFC should increase aviation data integrity. Consideration should be given to utilizing an aviation-specific system.
6. GFC should determine the number and type of assets necessary to meet its aviation needs.

### *Agency Response:*

**Recommendation 1:** GFC noted that expectations of the aviation program are discussed with the Air Operations Chief, though they are not currently being documented in the Policy and Procedure Manual and Flight Operations Manual. GFC agreed to formalize its procedure despite a concern that it would need to constantly revise the guidance based on changing conditions (e.g., budget cuts).

**Recommendation 2:** While GFC has provided this guidance to county unit personnel via e-mail and as part of its formal fire readiness training, it noted that “additional refresher guidance can be

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<sup>14</sup> This included the compensation for aviation staff, obtained from Open Georgia with the fringe benefit calculation included, and all expenditures associated aviation operates based on the department codes in Georgia’s TeamWorks Financials accounting system.



provided by Fall 2021.” GFC also agreed that this information could be more formally documented in guidance materials to ensure it is accessible to all current and future GFC personnel.

**Recommendation 3:** GFC indicated that it currently tracks various aviation activity data on its intranet and in wildfire reports. However, GFC agreed with the need to clarify existing data points (e.g., wildfires worked) and expand data collection efforts to include fields such as fire class day to enhance management decision-making.

**Recommendation 4:** According to GFC, this is already being tracked on its intranet “on the rare occasions in which external assets are used.” However, GFC noted that the information will need to be updated to reflect external entities’ current aviation assets.

**Recommendation 5:** In addition to aviation activity data currently tracked on its intranet, GFC noted that it “also use[s] SpiderTracks which tracks real-time and historic aircraft activity.” However, GFC agreed that improvements in these systems are necessary to improve integrity and accessibility of the data contained. GFC also expressed its interest in exploring software utilized by other state entities.

**Recommendation 6:** GFC confirmed its plans to “modernize [its] aviation fleet from 18 to 15 aircraft” and indicated that it “will continue to determine the appropriate number of assets over the next 12 months.”

### Finding 3: Opportunities exist to better distribute wildland firefighting personnel with wildfire risk and workload.

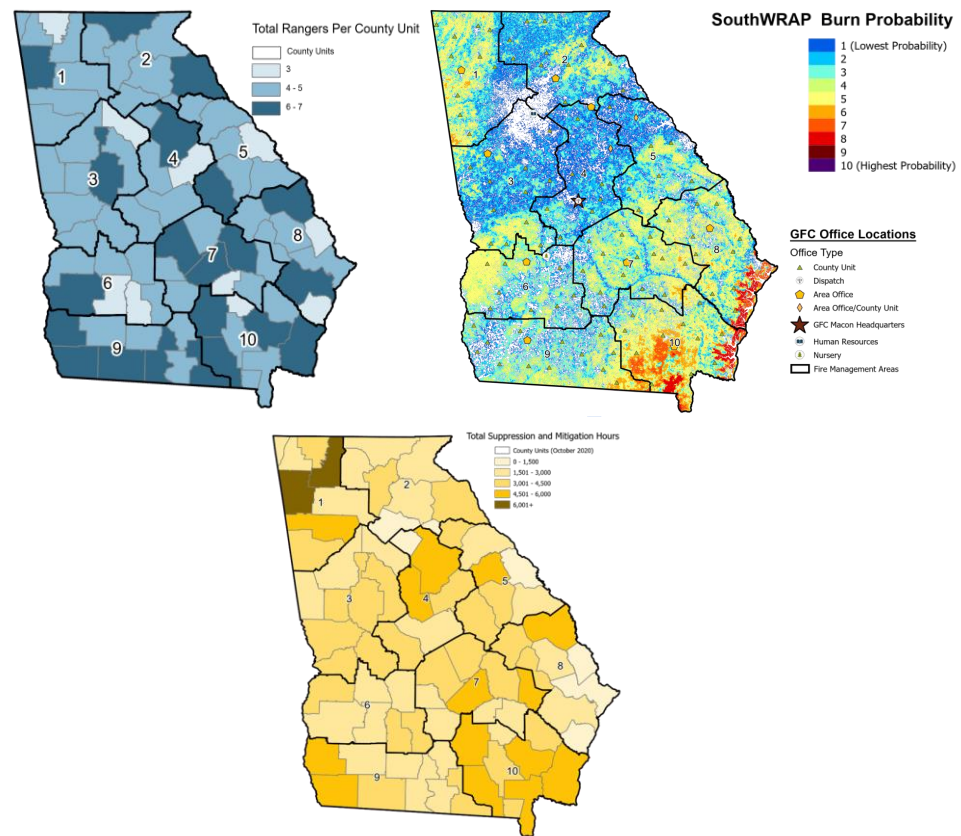
GFC’s distribution of rangers has been based on a statewide response time goal and historic staffing patterns for its 77 county-units. While wildfire risk and workload play some role in GFC’s staffing allocation decisions, this is largely an ad hoc process that occurs in conjunction with staff departures. As a result, ranger workload across county-units varies significantly.

In fiscal year 2021, GFC allocated approximately 360 rangers (including chief rangers) across its 77 county-units. County-unit staffing ranges from three to seven rangers, with most employing either four or five rangers. The minimum staffing goal for county-units is three rangers due to on-call duties.

We used wildfire risk and workload to assess the extent to which wildland firefighting personnel were allocated appropriately across the state. It should be noted that allocating wildland firefighting personnel is complex and there are a number of factors that could impact distribution. For our analysis, we focused on wildland fire risk and GFC’s suppression and mitigation workload by county-unit. Suppression and mitigation workload hours, GFC’s highest priority areas of responsibility, include wildfire suppression, prescribed burning assistance, mastication, and plowing and harrowing activities.

Based on the most recent assessment of burn probability and current staffing assignments, staffing across Georgia does not directly correspond to wildfire risk.<sup>15</sup> As shown in Exhibit 7, county-units with higher wildfire risk may have the same number or fewer personnel than county-units with lower wildfire risk. For example, Areas 1 and 10 are generally seen as high-risk areas in the state, while Areas 3 and 4 are among the lowest risk. However, large portions of Area 1 have four or five rangers—fewer than some county-units in Areas 3 and 4.

### Exhibit 7 Personnel Staffing Could Better Align With Wildfire Risk and Suppression and Mitigation Workload<sup>16</sup>



Source: DOAA analysis of GFC personnel, workload, and SouthWRAP data

As shown in Exhibits 7 and 8, the current staffing allocation model results in significant differences in suppression and mitigation workload<sup>17</sup> among county-units

<sup>15</sup> For wildfire risk we utilized the burn probability map from Southern Wildfire Risk Assessment Portal (SouthWRAP)

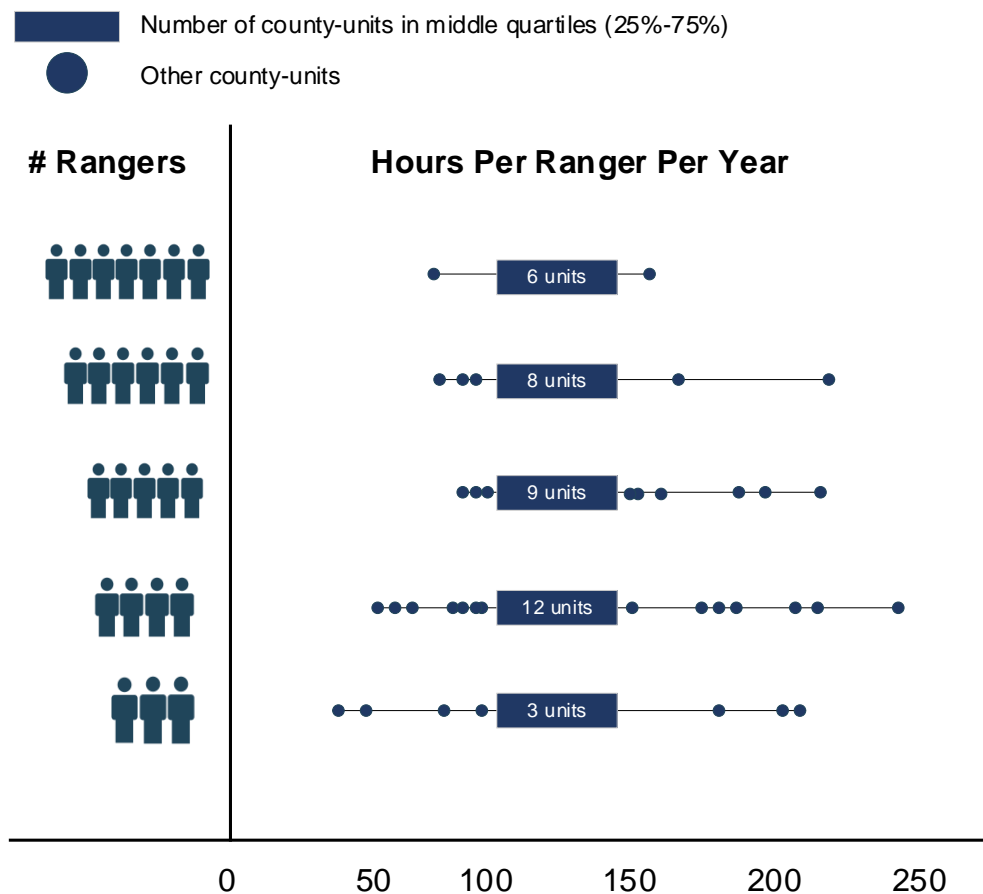
<sup>16</sup> The personnel staffing data is from fiscal year 2021, the SouthWrap burn probability map is from fiscal year 2015, and the suppression and mitigation workload hours cover the periods of fiscal years 2014 through 2019.

<sup>17</sup> We analyzed GFC total workload data, specifically hours spent in each county-unit on wildfire suppression and mitigation work, from fiscal years 2014-2020 to evaluate the allocation of personnel across the state. We focused on suppression and mitigation work hours because GFC stated fire control is the most important mission, followed by mitigation.

with the same number of rangers. For example, in county-units with four rangers, the average number of hours per year ranges from 52 to 232 hours, with a median of 110 hours (see Exhibit 8). While one county-unit with low suppression and mitigation workload had significant total workload, the remainder did not, with only two in higher risk areas of the state. Furthermore, some county-units with less than the seven rangers have higher risk and higher workload than county-units with seven rangers. There may be valid reasons for these variations because GFC also plays a role in other emergencies, including clearing trees following hurricanes and providing logistical support for the state's response to COVID-19. However, there is no formal staffing plan indicating the needed number of personnel and support for such staffing levels.

### Exhibit 8

#### Average Hours Per Ranger Per Year Spent on Suppression and Mitigation Varies Among County-units from 36 to 232 Hours, FY 2014-2019



Source: DOAA analysis of GFC personnel and workload data

Staffing assignments appear to be primarily dictated by the minimum staffing requirements for GFC's historically placed county-unit offices, which help GFC achieve goals related to response time and rangers per forested acre. However, both goals should be assessed to consider local needs, as described below.

- **Forested Acres** – GFC staff stated they have a goal of one ranger dedicated to every 65,000 forested acres, though the actual allocation may fluctuate. However, this goal treats all forested acres as equal when they are not. Due to

topography, fuel types and loads, and critical infrastructure, the risk varies depending on the location.

- **Response Time** – The statewide 45-minute response time goal is not connected to risk levels that should dictate how quickly rangers should reach a wildfire. There are likely areas around urban centers or in other lower risk portions of the state that do not need to be within 45 minutes of a GFC office. Likewise, there may be higher risk parts of the state where a 30-minute response time goal is more appropriate.

As previously discussed, the number and location of the county-unit offices helps achieve the response time goal. However, it also creates redundancy because some areas are within 45 minutes of multiple county unit offices. Our analysis of response time based on office location<sup>18</sup> found opportunities exist to decrease the number of offices while still ensuring nearly all of the state can still be reached within 45 minutes. This could also result in a better allocation of personnel to areas of higher need.<sup>19</sup> Redundancy may be appropriate in higher risk areas but unnecessary in lower risk areas. GFC should formally determine where and how much redundancy is required.

According to GFC personnel, staffing adjustments are made only when retirements and resignations occur. While this indicates intention to allocate according to potentially changing needs, it should be based on a long-term staffing plan that has systematically assessed local needs based on wildfire risk and ranger workload. Given the number of factors that would inform such a plan (e.g., county-unit office location, workload, wildfire risk), outside resources may be required to analyze data and draw conclusions.

## RECOMMENDATIONS

1. GFC should evaluate statewide goals related to response time and forested acres per ranger.
2. GFC should study the number and placement of county-unit offices to determine the optimal number and placement of offices needed to achieve agency objectives. Additional expertise may be needed to develop the methodology and criteria necessary to conduct the study. County-unit placement decisions should be evaluated on an on-going basis in response to changing landscape and other conditions. For example, updates could coincide with updates to the SouthWRAP, which occurs every five to 10 years.
3. Based on revisions to goals and number of offices, GFC should create a statewide staffing plan that allocates rangers according to individual county-unit needs.

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<sup>18</sup> We used ArcGIS to run a network analysis using the most conservative road conditions allowed in the model to determine the impact of removing varying numbers of office locations.

<sup>19</sup> It should be noted this analysis was focused only on number and location of offices, not personnel count.

*Agency Response:*

*Recommendation 1:* GFC indicated that it “will continue to evaluate goals related to response time and forested acres per ranger.”

*Recommendation 2:* According to GFC, it “will actively engage in studying the number and placement of county unit offices to determine this over the next 18 months.”

*Recommendation 3:* GFC stated that it would “consider using an external consultant to develop a statewide staffing plan over the next 18 months.”

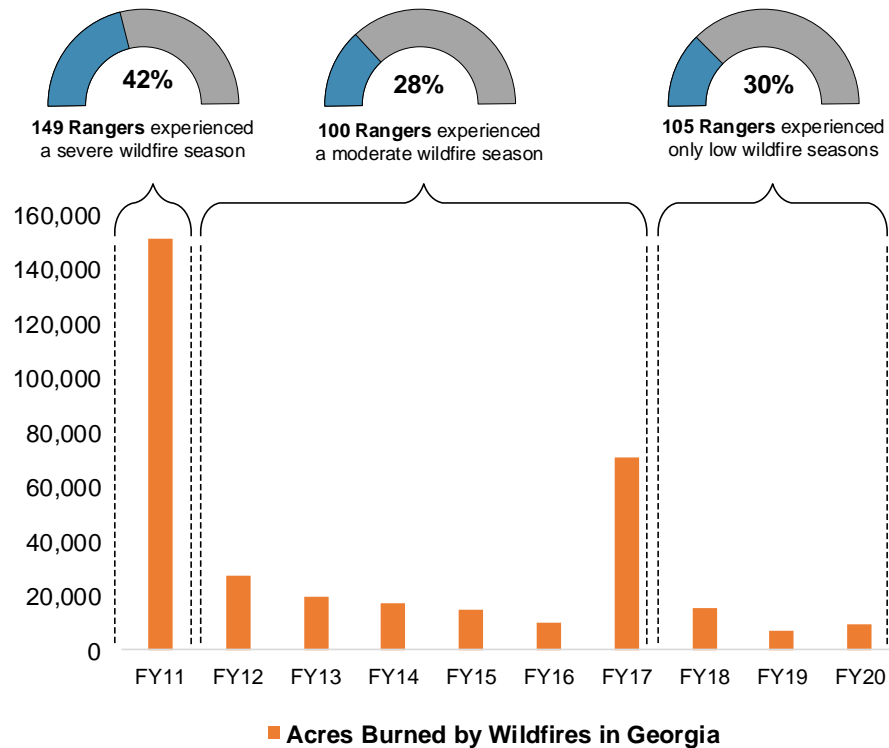
**Finding 4: Opportunities exist for GFC to mitigate the risks associated with the lack of wildfire experience among its forest protection staff.**

Most of GFC’s rangers have been hired in the last six years and have not experienced a severe wildfire season. While GFC has expressed concern over this lack of exposure, central office has not formally developed additional training or created opportunities for on-the-job experience. The lack of wildfire experience and planning to mitigate associated risks increases the potential of poor decision-making by rangers attempting to suppress large wildfires during future severe wildfire seasons.

Experience with wildfires is essential to making the right decisions in emergency situations. Exposure to wildfires increases rangers’ understanding of wildfire behavior and what actions should be taken to suppress it without risk to human life. According to GFC, the importance of this experience increases as rangers move into leadership roles. Chief rangers must know not only how they should respond to a wildfire, but how to direct teams of rangers under their control. Lack of wildfire experience threatens both the safety of rangers and the ability to contain wildfires during initial attack. Research shows that poor response decisions can increase the intensity and size of wildfires, as well as the time it takes to contain them.

As shown in **Exhibit 9**, 58% of current rangers (205 of 354) have not experienced a severe wildfire season. Only 149 rangers (42%) experienced the last severe wildfire season in 2011, during which wildfires burned 151,000 acres in Georgia. While a moderate season occurred in 2017 (wildfires burned 71,000 acres), nearly 30% of the current rangers experienced neither the 2011 nor 2017 wildfires seasons. Instead, during the past three years they have experienced wildfires that have only burned approximately 32,000 acres, cumulatively. In addition, 17 of 74 chief rangers (23%) have not experienced a severe wildfire season. While it is more likely that a county-unit’s chief ranger has major wildfire experience to rely on to direct personnel, they are not always the first to respond to wildfires and rangers need to make quick, quality decisions when working a wildfire. There are approximately four rangers for every chief ranger.

### Exhibit 9 Majority of Rangers Hired After Last Severe Wildfire Season



Source: DOAA analysis of GFC personnel and wildfire data

According to GFC, the lack of wildfire experience, and experience in general, has made it difficult to identify and fill more senior management positions. For example, several Area FMOs and some GFC central office staff had concerns regarding a lack of qualified individuals available to fill the Area FMO positions when retirements occur. To qualify to be an Area FMO, a candidate would need a minimum of seven years of fire control experience, including at least four years of ranger oversight. Succession planning was noted as a need during interviews with GFC managers.

Additionally, a lack of experience can hinder GFC from establishing high-level Incident Management Teams (IMTs) that respond to large wildfire incidents. Currently, GFC does not have rangers with sufficient qualifications to fully staff a Type 2 IMT, which is necessary for extended, multi-day wildfires. In the event a Type 2 team is needed, GFC would need personnel from other states to fill the gap. It should be noted that a Type 2 team was last needed in 2017 and was created jointly with the federal government to address a wildfire involving federal and state property. Type 3 incidents are more common in Georgia, and GFC personnel indicated they currently have qualified staff for a Type 3 team.

The turnover rate among rangers has contributed to limited ranger experience. While GFC's ranger turnover rate is similar to the state government average (approximately 20%), GFC management expressed concern about the ability to retain rangers given the critical nature of the job and the specific skills acquired during their employment, including obtaining a Commercial Driver's License and operating heavy equipment such as dozers. According to GFC, rangers can make considerably more money (salary

of \$60,000) and work a regular schedule in the private sector operating heavy equipment. Salary is noted as the primary reason rangers leave, though GFC staff stated the recent increase to rangers' starting salary (from \$26,700 to \$30,000) has helped.

GFC has taken informal action at the headquarters and county-unit level to address rangers' experience. This includes relying on chief rangers' knowledge of their rangers' experience, tracking who plans to retire, and performing informal after-action reviews. However, these risks should be formally addressed at a statewide level. Specific action includes:

- **Formally tracking rangers' wildfire experience** – An inventory of ranger experience and qualifications would help central office and county-units prioritize who needs additional training or may benefit from increased exposure to wildfire activity.<sup>20</sup> Much of this data already exists in the federal Incident Qualifications System and in fire reports but could be combined with insights from chief rangers and Area FMOs into a summarized format for better management information. This information could be used to identify areas where wildfire experience is particularly limited and thus may require additional staff during periods of high wildfire risk.
- **Formal succession planning** – This would include tracking and identifying county-units and Areas that might lack sufficient experienced rangers to fill future retirements and a developing plan to mitigate that.

Succession planning is also essential for Incident Management Teams (IMTs). Establishing IMT rosters with primary, secondary, and alternate personnel identified for each position would provide management with information on gaps and who could be quickly called up. The Texas Forest Service does this for both Type II and Type III teams. GFC should determine and formally document the number and types of IMTs it needs, rosters for each, and succession plans for any planned team member retirements.

- **Additional training** – GFC has not conducted any recent exercises to simulate a large wildfire due to cost. Rangers could also gain experience through formalized after-action reviews<sup>21</sup> following a wildfire; however, there is currently no policy regarding when these should occur or what they should include. There could also be opportunities to incentivize GFC rangers to gain experience through out-of-state assignments through offering bonus pay, tying wildfire experience to promotion schedules, or providing limited leave time. Out-of-state assignments would increase GFC rangers' wildfire experience without incurring additional cost to the state (salary costs for rangers on out-of-state assignments are funded by the entity they are assisting).

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<sup>20</sup> GFC could increase such exposure by temporarily assigning rangers to areas of the state with higher wildfire risks and incidents. GFC did this informally in the past but no longer does so due to the cost. However, creating a formal program to achieve this would increase efficiency through higher assurance that the rangers who would benefit the most would have the opportunity to participate.

<sup>21</sup> After-action reviews are a formal discussion after a wildfire incident that allows wildland firefighters at all levels to discuss successes and failures, including root causes to both. This allows teams better prepare for future wildfire incidents.



## RECOMMENDATIONS

1. GFC should create a formal plan with specific action to address the risks associated with rangers' lack of experience with large wildfires. Actions should include formally tracking ranger experience and using the information to develop succession plans for field management positions and IMT positions (as discussed below).
2. GFC should determine what types of IMTs it needs, create formal lists of rangers who meet the necessary qualifications including primary, alternate, and others qualified, and identify future gaps in personnel qualified for IMT positions.
3. GFC should create a standard policy on when formal after-action reviews will occur, dependent upon wildfire size, complexity, or both. In addition, GFC should provide a template to guide the creation of after-action reviews.
4. The General Assembly should consider periodically funding a large wildfire training exercise to be conducted by GFC.<sup>22</sup> While costs could vary, they may be lowered if GFC partnered with the federal National Incident Management Organization.

### *Agency Response:*

**Recommendation 1:** GFC noted that while it “formally tracks ranger experience through Incident Qualification System (IQS) qualification records on the GFC intranet,” it will incorporate this recommendation into the development of a statewide staffing plan recommended in Finding 2.

**Recommendation 2:** GFC noted that it “has a roster for a Type 3 Incident Management Team (IMT) with a future goal of developing a Type 2 team.” While it is aware of who is qualified to serve on a Type 3 IMT, GFC indicated it would develop and maintain a current listing of all staff who are qualified to fill positions on the IMT.

**Recommendation 3:** GFC stated that an “After Action Review (AAR) template currently exists in [its] Incident Response Guide” and noted that it “will develop a policy for when AARs [are to] occur by the end of FY21.”

**Recommendation 4:** GFC agreed and indicated that it “will pursue federal or state financial resources to perform a mock large wildfire training exercise in the Fall of 2021.”

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<sup>22</sup> Other state entities should be involved who have a role in large wildfire incidents, including the Georgia Emergency Management Agency, Georgia Department of Natural Resources, and Georgia State Patrol.



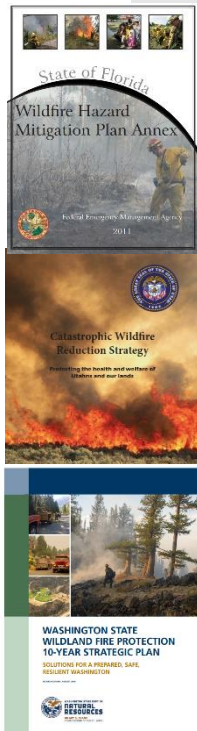
**Finding 5: GFC has adopted local plans for wildfire response and mitigation; however, there are broad gaps in guidance at both the state and local level.**

GFC has not conducted statewide planning to guide rangers performing mitigation and suppression activities. GFC relies on county units to develop planning documents, but the plans provide limited guidance on actions needed to address local needs and how to respond to wildfire incidents.

### Statewide Planning and Guidance

While wildfire response and mitigation planning primarily occurs locally, it is necessary for some aspects to occur at the state level to provide comprehensive planning, monitor progress on completing objectives, and prioritize projects across the state. Other state and federal wildfire management plans we reviewed frequently document the responsibilities of different parties and provide information on how wildfire response activities and mitigation projects will occur. For example, the federal Georgia Interagency Fire Danger Operating Plan (FDOP) created plans for preparedness and wildfire response.<sup>23</sup> In their statewide plans, Florida outlines priorities and funding sources for regional and local mitigation projects, Utah identifies and prioritizes regional projects to reduce catastrophic wildfires, and Washington establishes strategies and prioritizes actions to achieve better fire outcomes.

#### Other States' Wildfire Management Plans



**Florida Wildfire Hazard Mitigation Plan Annex (2013)** - This plan outlines Florida's planning process, wildfire risk assessment, mitigation strategy, coordination efforts, and maintenance and implementation process. It also outlines a multi-level mitigation strategy. The plan emphasizes state-level personnel support for the development of local wildfire risk mitigation planning, followed up by routine effectiveness evaluations. The specific case studies outlined in this document highlight the need for strategic resource allocation and project prioritization, an ongoing funding source identification process, strong community relationships, and involvement from elected officials.

**Utah Catastrophic Wildfire Reduction Strategy (2013)** - This plan was established to create a comprehensive and systematic strategy to reduce the size, intensity, and frequency of catastrophic wildland fires in Utah. It includes a well-defined planning process, which includes describing current conditions, gaps, and principles. The Strategy identifies and prioritizes projects—and projects costs for each—across six geographic regions to reduce the risk of catastrophic wildfires. Furthermore, the Steering Committee reports to the Governor and legislature annually regarding both actions planned and taken.

**Washington State Wildland Fire Protection 10-Year Strategic Plan (2019)** - This plan is designed to be a holistic approach to achieve better alignment throughout the state to reduce losses and costs from wildfires. It establishes cross-cutting strategies to address defined goals to achieve better fire outcomes. Examples include pre-fire response analysis and planning, conducting comprehensive risk-mitigation planning to prioritize actions, and providing succession planning for IMTs and other positions, among other goals and strategies. An appendix provides priority for each action, timeline for completion, and the lead entity to accomplish it.

<sup>23</sup> The FDOP's Preparedness Plan covers federally-owned properties in Georgia and "provides management direction given identified levels of burning conditions, fire activity, and resource commitment." The wildfire response plans specify the number and type of suppression assets to dispatch based on the geographic area, weather and fuel conditions, and other variables.

GFC's central office has generally delegated planning and monitoring activities to the county-units. The lack of statewide planning creates gaps in guidance in areas discussed below, which can increase the risk of wildfire occurrence and intensity:

- When resources, such as aviation, should be used for wildfire suppression;
- What mitigation projects have been identified and how they are to be prioritized (ideally tied to impact on reducing wildfire risk); and
- What should be included in any response and/or mitigation plans, including examples and details and how these plans should be tailored to local needs, based on central office criteria (see below).

Additionally, three other states' plans we reviewed include monitoring and evaluation activities to identify deficiencies and improve initiatives, which a state's central office is often best equipped to do. For example, Utah provides to the governor and legislature annual reports containing the actions planned and taken to address each recommendation from the Catastrophic Wildfire Reduction Steering Committee, including performance measures used to gauge progress. Likewise, every three years Florida evaluates its plan, including the planning process, wildfire risk assessment, mitigation strategy, and coordination of local mitigation planning. Washington incorporates monitoring throughout its plan by using quantitative risk assessments, similar to the Southern Wildfire Risk Assessment, to evaluate the effectiveness of mitigation activities and inform future mitigation planning.

GFC tracks extensive activity-level data; however, it does not monitor progress towards completion of the objectives outlined in planning that does occur (primarily through the Community Wildfire Protection Plans (CWPPs), discussed below). It also has not evaluated the effectiveness of its mitigation and prevention activities at reducing risk, which would help determine which activities to prioritize and encourage throughout the state—or among certain county-units. Evaluating the impact of activities should be integrated into both state and local plans.

### Local Planning and Guidance

While a statewide plan provides high-level guidance for GFC activities, local plans are also necessary to account for the variation in wildfire risk levels, specific areas of concern for wildfire response (such as geographic terrain), and possible mitigation projects to reduce that risk.

GFC has indicated that the federally required CWPPs meet the response and planning needs for the state and local communities. GFC leadership noted CWPPs help inform staff on how to respond more effectively in each community, specifically through identifying wildfire causes, how to prevent those fires, and how to respond more quickly to wildfires.

The federal guidance for CWPPs includes several areas that would assist GFC's county-units; however, our review of 18 CWPPs found that they have limitations. In general, the CWPPs largely mirror each other and lack details on the specific concerns or types of mitigation projects necessary to address risks in each county. Examples of specific gaps are discussed below.

- The U.S. Fire Administration's (USFA) guidance on CWPPs recommends plans identify general areas and critical infrastructure at risk to wildfire, such

as area water supply or telecommunication equipment. The GFC plans reviewed lacked sufficient information on response planning and actions to address area-specific assets that may be at risk.

- The guidance notes that CWPPs can include firefighting capabilities; for example, Florida's guidance states its CWPPs should include local capacity including emergency management and fire services. However, the plans we reviewed lacked information on non-GFC fire and emergency resources, including local fire resources that may be positioned nearby. This information could be useful in response planning and determining when and where to pre-position resources during periods of high wildfire risk and activity.
- The guidance recommends including forest health and fire fuels class, including issues with pests, large storms, and whether prescribed fire, or mechanical/chemical treatments are needed to reduce fuel load in specific areas. The plans we reviewed lacked information on areas with unique fuel loads or forest health concerns.
- The guidance recommends CWPPs include an action plan to identify and prioritize project work that needs to be completed in a community. However, CWPPs we reviewed lacked prioritized lists of mitigation projects and activities including location, cost, timeframe, and the entity(s) responsible for executing the projects. In addition, the plans did not identify high risk areas that should be prioritized for mitigation activities and would need a more robust initial attack during a wildfire incident.

While the Brooks County CWPP does not include everything noted above, it does provide detailed, actionable items throughout the Plan and lists non-GFC fire and emergency resources that are positioned nearby. As shown in **Exhibit 10**, the Brooks County CWPP identifies specific projects, including the agency responsible, funding needs, and priority level for each. This provides a list of agreed-upon action items that the county-unit can use to monitor progress and evaluate impact.

### Exhibit 10

#### Brooks County CWPP Includes Specific, Prioritized Projects

Area at Risk	Project	Agency	Funding Needs	Priority	Recommendation
Countywide	Install 6 Water Storage Tanks in strategic locations in the County	County	\$60,000	High	Enhance water availability in high wildfire risk areas of unincorporated Brooks County
Countywide	(3) 2,000-4,000 Gallon Water Tenders	County	\$750,000	High	Mobile water supply for W/UI areas
Countywide	Drafting Equipment "Turbo draft"	County	\$9,000	High	3 Large "Turbo-draft" at \$3,000 each
Countywide	Wildland Fire PPE & Hand Tools	County	\$25,000	High	Personal Protective Equipment & Fire Shelters (4 sets per station)
Countywide	(3) Type VI Engines (Brush Truck)	County	\$540,000	High	Improve County's off-road firefighting capability
Countywide	Firefighter Training (SO)	County GFC	\$15,000	Medium	NIIMS, Standards for Survival & Wildland Fire Behavior Training. Ready Set Go training.

Source: GFC CWPP documents

GFC has left response and mitigation planning efforts up to local county units but has not provided guidance or oversight of these efforts. In particular, GFC has provided no formal guidance or requirements for local county units to incorporate wildfire response planning or detailed mitigation plans into CWPPs. GFC did send contractors to the various counties to assist with creating the plans, but this resulted in plans with similar broad language.

## RECOMMENDATIONS

1. GFC should create a statewide wildfire management plan to document responsibilities of different parties, prioritize projects across the state, and establish strategies to achieve better fire outcomes. Specifically, such plan would include:
  - a. A statewide list of mitigation projects, which could be documented at an area, zone, or statewide level so that the organization is aware of and prioritizes the most impactful mitigation projects.
  - b. Formal guidance regarding when aviation assets should be requested to provide overwatch and/or suppress a wildfire. This could be part of a broader aviation strategic plan that identifies the mission, goals, and needs of a wildland firefighting aviation program as discussed in the finding on page 8.
  - c. Consistent definitions in the statewide and local plans for terms such as priority level.
2. GFC should monitor progress towards completing objectives outlined in statewide and local plans and evaluate the effectiveness of its mitigation and prevention activities at reducing risk. One method to evaluate this effectiveness is using quantitative risk assessments, such as when the Southern Wildfire Risk Assessment is updated, to identify any risk reductions resulting from such activities.
3. GFC should require CWPPs or other local planning documents to include detailed response guidance, which could include assets that could be at risk, areas that could need aviation support, areas with unique fuel loads or topography concerns, and wildfire suppression tactics that should or should not be used based on the county's unique features.
4. GFC should require CWPPs or other local planning documents to include a detailed, prioritized list of proposed mitigation projects, including responsibility and funding source. Progress should be tracked on each when CWPPs are updated, which should occur every five years per GFC.

### *Agency Response:*

**Recommendation 1:** GFC stated that it “has focused on county-level planning in the past and will continue to do so but will also develop a statewide management plan over the next 18 months.”

**Recommendation 2:** According to GFC, its partnership with a private firm on a pilot project to update the Southern Wildfire Risk Assessment will help to address this recommendation.

**Recommendation 3:** According to GFC, it uses “the national template for the CWPPs” but agrees that the plans should “include specific, local information” as recommended.

**Recommendation 4:** GFC stated that it “currently updates CWPPs every five years.” However, GFC stated that it will ask Chief rangers to update the plans annually, which will be monitored through performance reviews.

**Auditor’s Response:** As clarification, our recommendation was not intended to suggest that plans be reviewed more frequently than every five years.

## Appendix A: Table of Recommendations

<b>Historically, GFC has successfully suppressed wildfires in Georgia. (p. 7)</b>
No recommendations
<b>Additional information should be collected to determine whether GFC has the appropriate number and types of aviation resources. (p. 8)</b>
1. GFC should formally define what the aviation program is expected to accomplish.
2. GFC should create guidance regarding when incident commanders should request aerial suppression support.
3. GFC should track data that would allow management to assess activity and need for aviation resources. This may include the fire class day and key qualitative data on aerial wildfire suppression.
4. GFC should track use of external aviation assets in fighting wildfires, including frequency, and the response time from request to arrival on scene.
5. GFC should increase aviation data integrity. Consideration should be given to utilizing an aviation-specific system.
6. GFC should determine the number and type of assets necessary to meet its aviation needs.
<b>Opportunities exist to better distribute wildland firefighting personnel with wildfire risk and workload. (p. 13)</b>
7. GFC should evaluate statewide goals related to response time and forested acres per ranger.
8. GFC should study the number and placement of county-unit offices to determine the optimal number and placement of offices needed to achieve agency objectives. Additional expertise may be needed to develop the methodology and criteria necessary to conduct the study. County-unit placement decisions should be evaluated on an on-going basis in response to changing landscape and other conditions. For example, updates could coincide with updates to the SouthWRAP, which occurs every five to 10 years.
9. Based on revisions to goals and number of offices, GFC should create a statewide staffing plan that allocates rangers according to individual county-unit needs.
<b>Opportunities exist for GFC to mitigate the risks associated with the lack of wildfire experience among its forest protection staff. (p. 17)</b>
10. GFC should create a formal plan with specific action to address the risks associated with rangers' lack of experience with large wildfires. Actions should include formally tracking ranger experience and using the information to develop succession plans for field management positions and IMT positions (as discussed below).
11. GFC should determine what types of IMTs it needs, create formal lists of rangers who meet the necessary qualifications including primary, alternate, and others qualified, and identify future gaps in personnel qualified for IMT positions.
12. GFC should create a standard policy on when formal after-action reviews will occur, dependent upon wildfire size, complexity, or both. In addition, GFC should provide a template to guide the creation of after-action reviews.
13. The General Assembly should consider periodically funding a large wildfire training exercise to be conducted by GFC. Costs could vary. A potential lower cost option would be to partner with the federal National Incident Management Organization.
<b>GFC has adopted local plans for wildfire response and mitigation; however, there are broad gaps in guidance at both the state and local level. (p. 21)</b>

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| <p>14. GFC should create a statewide wildfire management plan to document responsibilities of different parties, prioritize projects across the state, and establish strategies to achieve better fire outcomes. Specifically, such plan would include:</p> <ul style="list-style-type: none"><li>a. A statewide list of mitigation projects, which could be documented at an area, zone, or statewide level so that the organization is aware of and prioritizes the most impactful mitigation projects.</li><li>b. Formal guidance regarding when aviation assets should be requested to provide overwatch and/or suppress a wildfire. This could be part of a broader aviation strategic plan that identifies the mission, goals, and needs of a wildland firefighting aviation program as discussed in the finding on page 8.</li><li>c. Consistent definitions in the statewide and local plans for terms such as priority level.</li></ul> |
| <p>15. GFC should monitor progress towards completing objectives outlined in statewide and local plans and evaluate the effectiveness of its mitigation and prevention activities at reducing risk. One method to evaluate this effectiveness is using quantitative risk assessments, such as when the Southern Wildfire Risk Assessment is updated, to identify any risk reductions resulting from such activities.</p>   |
| <p>16. GFC should require CWPPs or other local planning documents to include detailed response guidance, which could include assets that could be at risk, areas that could need aviation support, areas with unique fuel loads or topography concerns, and wildfire suppression tactics that should or should not be used based on the county's unique features.</p>  |
| <p>17. GFC should require CWPPs or other local planning documents to include a detailed, prioritized list of proposed mitigation projects, including responsibility and funding source. Progress should be tracked on each when CWPPs are updated, which should occur every five years per GFC.</p>  |

## Appendix B: Objectives, Scope, and Methodology

### Objectives

This report examines the Georgia Forestry Commission (GFC) Forest Protection program. Specifically, our audit set out to determine the following:

- Is GFC adequately prepared for wildfire seasons of all severity levels?
- To what extent has GFC allocated existing Forest Protection resources to areas with the highest need?
- To what extent does GFC evaluate the cost effectiveness of wildfire prevention, mitigation, and suppression activities at reducing the number and size of wildfires?

### Scope

This audit generally covered activity related to the activities conducted by the Georgia Forestry Commission (GFC) to prevent, mitigate, and suppress wildfires during fiscal years 2014 to 2020, with consideration of earlier or later periods when relevant. Information used in this report was obtained by using relevant laws, rules, and agency documents. We also interviewed agency officials and program staff from the GFC Forest Protection, Administration, Human Resources, and Information Technology divisions; the Georgia Emergency Management Agency; and wildfire response units in other states. We conducted site visits to two county-unit offices and the aviation office in Macon. We also analyzed several GFC datasets, which will be described under each relevant objective.

Government auditing standards require that we also report the scope of our work on internal control that is significant within the context of the audit objectives. Methods to establish internal control include plans, policies, methods, and procedures adopted by management to meet its mission, goals, and objectives. In addition, the processes for planning, organizing, directing, and controlling program operations and the systems for measuring, reporting, and monitoring program performance are part of a system of internal control. Specific information related to the scope of our internal control work is described by objective in the methodology section below.

### Methodology

To determine whether GFC is adequately prepared for wildfire seasons of all severity levels, we interviewed GFC staff at headquarters, zone fire management officers, area fire management officers, and field personnel (including chief rangers and rangers). We collected major operating policies and procedures, wildfire after action reviews, and community wildfire protection plans. We collected data related to this objective through GFC's intranet, including wildfire report data, workload data, and aviation data. We utilized the wildfire report data to determine frequency of wildfires exceeding GFC's goal of limiting wildfires to five acres or less. We used the workload data to determine whether there were areas where mitigation and prevention work were not able to be completed. We used the aviation data to determine the frequency and reason for use of aviation assets. We collected turnover data from GFC HR and compared the turnover data to state employee data collected the Georgia Department of Administrative Services (DOAS). The turnover rate from GFC was calculated using the average turnover divided by the average annual employment figure, not the monthly employment figure due to what data was available. Based on how the data



was utilized in the report, we believe the data to be sufficient for comparison to the DOAS data.

While we assessed the reliability of each dataset and determined that the data were sufficiently reliable for our analyses, the data was manually entered by GFC staff and we did not review any paper records for comparison.

With respect to this objective, the scope of work related to the design and operating effectiveness of GFC's system of internal control include: collection of organizational charts, collection and review of GFC's policy manual, interviews with GFC HR and staff at all levels about recruitment, training, and retention of rangers and performance appraisals for personnel, and interviews of personnel at headquarters and field personnel about the process of creating approving wildfire reports. Our analytical work evaluated aspects of the control environment, information systems, and monitoring. These components are largely discussed in findings 1, 2, 4 and 5.

**To determine extent to which GFC has allocated existing Forest Protection resources to areas with the highest need,** we interviewed GFC staff at headquarters, zone fire management officers, area fire management officers, and field personnel (including chief rangers and rangers) about how rangers are allocated across the state and across areas. We collected major operating policies and procedures, wildfire after action reviews, and community wildfire protection plans. We collected data related to this objective through GFC's intranet, including wildfire report data and workload data, to compare wildfire activity and workload related to suppression and mitigation of wildfires to staffing levels. We compared staffing levels at the county-unit level to the wildfire risk map from SouthWRAP (Southern Wildfire Risk Assessment project from the Southern Group of State Foresters).

While we assessed the reliability of each dataset and determined that the data were sufficiently reliable for our analyses, the workload data was manually entered by GFC staff and we did not review any paper records for comparison. The SouthWRAP data was last updated in 2015, but we determined despite the age it was still sufficiently reliable for the purposes of this objective.

With respect to this objective, the scope of work related to the design and operating effectiveness of GFC's system of internal control include: collection of organizational charts; collection and review of GFC's policy manual; interviews with GFC HR and staff at all levels about recruitment, training, and retention of rangers and performance appraisals for personnel; and interviews of personnel at headquarters and field personnel about the process of creating approving wildfire reports. Our analytical work evaluated aspects of the control environment, information systems, and monitoring. These components are largely discussed in Finding 3.

**To determine the extent to which GFC evaluates the effectiveness of wildfire prevention, mitigation, and suppression activities at reducing the number and size of wildfires,** we interviewed GFC staff at headquarters, zone fire management officers, and area fire management officers about how effectiveness of activities are monitored and if they evaluate the cost effectiveness of these activities. We interviewed GFC staff at all levels of Forest Protection on the usage of aviation resources to detect and suppress wildfires, including collecting policies and procedures related to aviation management. We collected data related to this objective through GFC's intranet, including aviation flight data, wildfire report data

and workload data, to determine frequency of aviation usage and variations of usage across the state. We compared aviation flight data to the wildfire risk map from SouthWRAP (Southern Wildfire Risk Assessment project from the Southern Group of State Foresters). We conducted literature reviews of fire science journals and reports related to effectiveness of wildfire prevention, mitigation, and suppression activities and reviewed federal and other state documents for monitoring and evaluating effectiveness of these types of activities.

While we assessed the reliability of each dataset and determined that the data were sufficiently reliable for our analyses, the workload data and aviation data was manually entered by GFC staff and we did not review any paper records for comparison. In particular, issues with the aviation flight data were noted and referred to in Finding 2. The SouthWRAP data was last updated in 2015, but we determined despite the age it was still sufficiently reliable for the purposes of this objective.

With respect to this objective, the scope of work related to the design and operating effectiveness of GFC's system of internal control include: collection of organizational charts, collection and review of GFC's policy manual, interviews with GFC staff at all levels about wildfire prevention, mitigation, and suppression activities and guidance on when to use each, and interviews of personnel at headquarters and field personnel about the wildfire management planning process. Our analytical work evaluated aspects of the control environment, information systems, and monitoring. These components are discussed in all five findings, particularly Findings 1, 2, and 5.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

## Appendix C: GFC Prevention and Mitigation Activities

The following are examples of GFC's prevention and mitigation activities:

**Public service campaigns** – Outreach and advertisements to the public to educate them on the dangers of wildfires and wildfire prevention.

**Prescribed burning** – As shown in the pictures below, controlled burns of forests and other lands at risk of wildfires to decrease the accumulated fuel loads and the potential of catastrophic wildfires.

**Aerial detection of wildfires** – Patrols by detection aircraft to look for and investigate fires and notify GFC rangers when wildfires are detected.

**Home assessments** – Evaluations of homes by GFC personnel to help homeowners determine how vulnerable their homes are to wildfires and what can be done to decrease such vulnerability.

**Firewise communities** – A program recognizing communities that have taken measures to be more resistant to wildfire damage. It involves working with GFC to assess the community and creating an action plan to address vulnerabilities.



Conditions Before Prescribed Burn

Conditions After Prescribed Burn

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The Performance Audit Division was established in 1971 to conduct in-depth reviews of state-funded programs. Our reviews determine if programs are meeting goals and objectives; measure program results and effectiveness; identify alternate methods to meet goals; evaluate efficiency of resource allocation; assess compliance with laws and regulations; and provide credible management information to decision makers. For more information, contact us at (404)656-2180 or visit our website at [www.audits.ga.gov](http://www.audits.ga.gov).