

2022 Aviation Annual Report



Aviation Annual Report
USDA Forest Service
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Executive Summary

This report summarizes U.S. Department of Agriculture's (USDA) A Forest Service aviation business data to characterize annual aviation use and costs for contract and agency-owned aircraft. Data summaries are presented to generate a picture of annual use at the agency management scale, and analysis methods are standardized to facilitate observation of trends in future annual reports. Summaries are presented by calendar year (January 1 – December 31) to capture the fire year and contracting cycles more thoroughly.

Data presented herein are from Incident Business System (IBS) obtained via the FAMWEB Data Warehouse. Additionally, some summaries are provided by agency aviation program specialists, contract specialists, or Regional Aviation Officers.

Fire year 2022 was another demanding year. Despite that, Forest Service agency-owned and contracted aircraft flew 60,619 hours in 2022, which was 11.9% below the 5-year average and 27.2% less than the previous high in recent years occurring in 2020.

Table 1 summarizes the utilization of the agency's fleet. These numbers are the actual number of aircraft utilized in 2022 and are not reflective of the number of contract line items per contract type. Actual number of contract line items may vary as some Exclusive Use aircraft are also awarded and utilized on CWN contracts, aircraft may be substituted during contract periods for maintenance, or Call When Needed (CWN) aircraft may not have been available at the time of a resource order.

The Airworthiness Branch inspected and issued cards to a total of 520 aircraft with 466 awarded USDA Forest Service contracts and 54 under U.S. Department of Interior contracts. Agency Fixed-Wing Inspector Pilots issued 457 contract pilot approvals and the Helicopter Inspector Pilots issued 1,200 to 1,500 USDA Forest Service and U.S. Department of Interior interagency contract pilot approvals.

Report Disclaimer

Incident Business System (IBS) archived aircraft use and cost data are stored in the FAMWEB Data Warehouse. This information tracks aviation use for the Forest Service, and summaries provided in this report are only as accurate as the archived data. Summaries provided may represent both fire and non-fire flight missions (e.g., wildlife tracking or forest health survey flights).

Not all aircraft utilized by the agency are billed through IBS (e.g., military aircraft with MAFFS units). Missing data and data entry errors may persist in the archived data and subsequent analyses. IBS is an agency invoicing tool and was not designed for historical analyses. The Forest Service updates IBS data as payments are processed.

Inconsistencies, omissions, or obvious data errors may be manually corrected prior to completion of the annual analyses; these corrections will be noted.

Summary totals may not align precisely with itemized values due to rounding practices.

Table 1 – CY 2022 Forest Service Aircraft Fleet Summary

Aircraft Type	Number of Aircraft
Helicopters	
Exclusive Use (EU)	82
Call When Needed (CWN)	222
Agency Owned – WCF	0
Airtankers	
Next Generation – EU	22
Next Generation – CWN	5
MAFFS	8
Multi-Engine Water Scoopers	
Call When Needed (CWN)	9
Fixed-Wing	
Aerial Supervision Module / Leadplane (Lease)	15
Light Fixed-Wing – EU	33
Light Fixed-Wing – CWN	74
Smokejumper Aircraft – EU	8
Smokejumper Aircraft – CWN	0
Large Transport – EU	1
Agency Owned Fixed-Wing – WCF	24

Aviation Utilization and Cost Information

The Forest Service provides aircraft for both fire and non-fire missions. Although the agency owns a limited number of aircraft, contract aircraft account for most of the aviation assets available for mission-related work. In 2022, 471 contracted aircraft and 24 agency-owned aircraft were utilized to meet agency missions.¹

This report categorizes aircraft into six groups: fixed-wing, helicopter, airtanker, multi-engine scooper, Modular Airborne Fire Fighting Systems (MAFFS), and unmanned/uncrewed aircraft systems (UAS). The data summaries include both agency-owned and contract aircraft, unless otherwise noted. The overall data totals represented do not include MAFFS and UAS flight hours since these systems do not report flight hours in IBS or in the FAMWEB Data Warehouse. MAFFS and UAS summaries are only reflected in their respective sections. The fixed-wing category includes the National Interagency Fire Center large transport jet, smokejumper aircraft, leadplanes, air attack, and all other fixed-wing aircraft not operating for the sole purpose of delivering a fire suppressant. The helicopter category includes all rotor-wing aircraft, regardless of flight missions. Unless otherwise noted, the airtanker category includes all flights and charges associated with any fixed-wing aircraft delivering a fire chemical suppressant to a fire (i.e., Single Engine Airtanker (SEAT), Large Airtanker (LAT), and Very Large Airtanker (VLAT)), with an exception for MAFFS which are presented separately. Finally, scoopers are multi-engine water scooping fixed-wing aircraft used in fire suppression.

2022 At-A-Glance

Aviation Use

Agency and contract aircraft flew 60,619 hours in calendar year 2022 (Figure 1), which was 11.9% below the 5-year average and 27.2% less than the previous high in recent years occurring in 2020 (CY 2018-2022 average is 68,846 hours). Surge aircraft were again used in 2022 to supplement the Exclusive Use fleet and provide additional capability at a negotiated rate for airtankers, water scoopers, helicopters, and aerial supervision aircraft using modified agreements guaranteeing Mandatory Availability Periods (MAPs).

The high fire activity resulted in 84.7% of the 60,619 annual flight hours being in direct support of fire or prescribed fire, with only 2.7% for resource missions (non-fire), 2.1% for training/maintenance and 10.5% percent for ferry flight and various other missions. For the year, aircraft activity peaked in August, with 24% of all annual flight hours; however, there was sustained significant flight time from June to September with monthly totals exceeding 7,000 hours (Figure 2).

¹ Values reflect the actual number of unique aircraft that operated and may not align with fleet size values due to contract processes (e.g., aircraft swaps, multiple contract awards).

Figure 1 – CY 2018-2022 Total Agency Flight Time

Calendar Year	Flight Hours
2018	76,230
2019	42,570
2020	83,324
2021	81,487
2022	60,619
5-Year Average	68,846

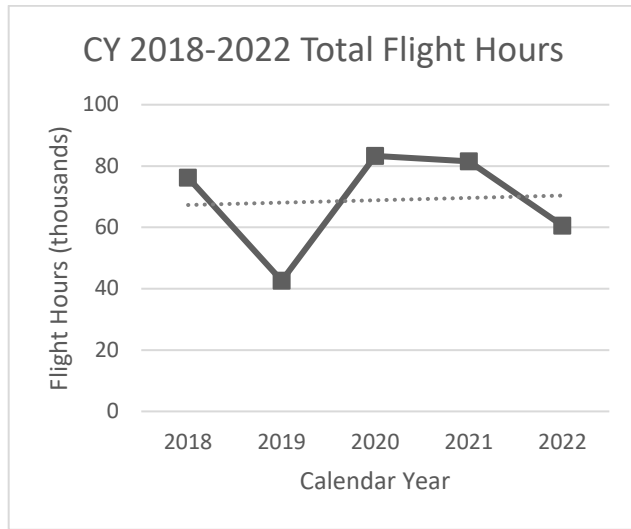
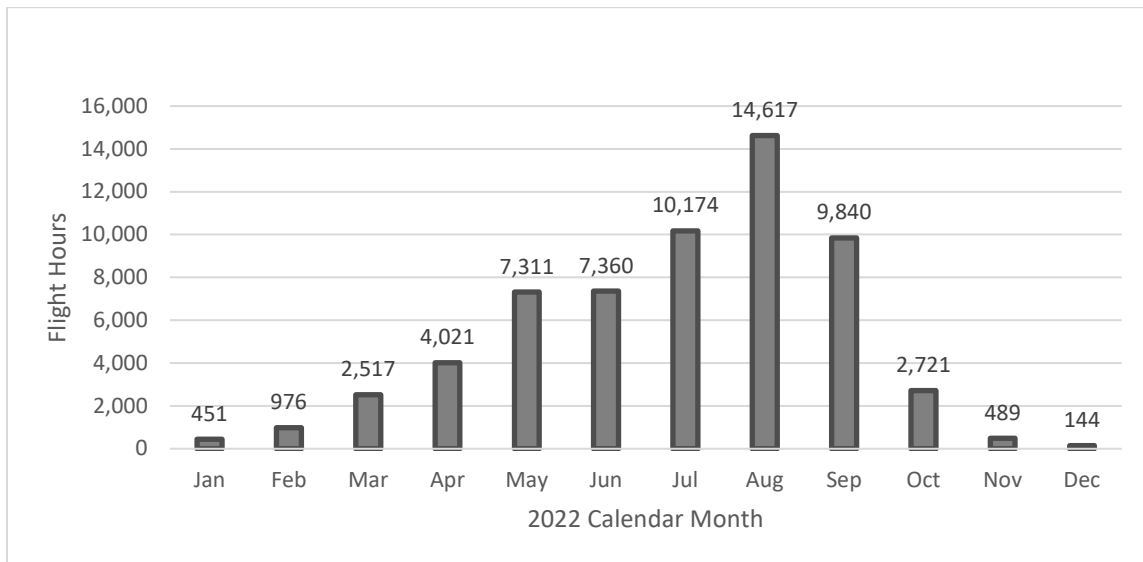


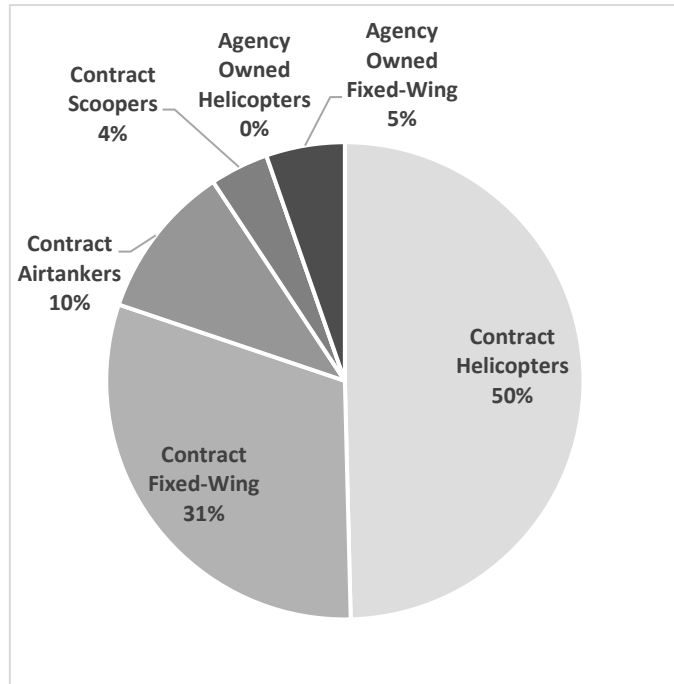
Figure 2 – CY 2022 Total Agency Flight Time by Month



Flight time for contract aircraft represented 94.7% of the annual total; agency flight hours accounted for the remaining 5.3% (Figure 3). Examination of the distribution of use by aircraft type and ownership demonstrates that contract helicopters (49.6%) and contract fixed-wing (30.6%) represented the largest proportion of use (Figure 3).

Figure 3 – CY 2022 Total Agency Flight Time by Aircraft and Contract Type

Aircraft Type	Flight Hours
Contract Helicopters	30,072
Contract Fixed-Wing	18,532
Contract Airtankers	6,375
Contract Scoopers	2,406
Agency-Owned Helicopters	0
Agency-Owned Fixed-Wing	3,235
Total	60,619



Flight hours in support of agency missions accounted for the bulk of flight time (72.0%), with 11.3% of flight hours attributed to Department of Interior missions, 16.7% to non-Federal missions, and 0.1% for missions related to other or unknown jurisdictions (Table 2). For USFS Regions, Region 3 led the agency with both Regions 1, 4, 5, and 6 also exceeding 5,000 Flight Hours.

Table 2 – CY 2022 Total Agency Flight Time by Region/Agency²

Region/Agency	Flight Hours	Percent of Total Flight Hours
FS: Region 1	5,391	8.9%
FS: Region 2	1,223	2.0%
FS: Region 3	10,305	17.0%
FS: Region 4	7,037	11.6%
FS: Region 5	6,086	10.0%
FS: Region 6	6,801	11.2%
FS: Region 8	2,309	3.8%
FS: Region 9	932	1.5%
FS: Region 10	909	1.5%
FS: Region 13 (WO)	2,404	4.0%
FS: Region Other (Research Stations, CIO, etc.)	225	0.4%
FS Total	43,622	72.0%
BIA	2,277	3.8%
BLM	3,119	5.1%
FWS	14	<0.1%
NPS	1,425	2.4%
DOI Total	6,835	11.3%
Non-Fed Fire (State)	10,113	16.7%
Other	49	0.1%
Grand Total	60,619	100%

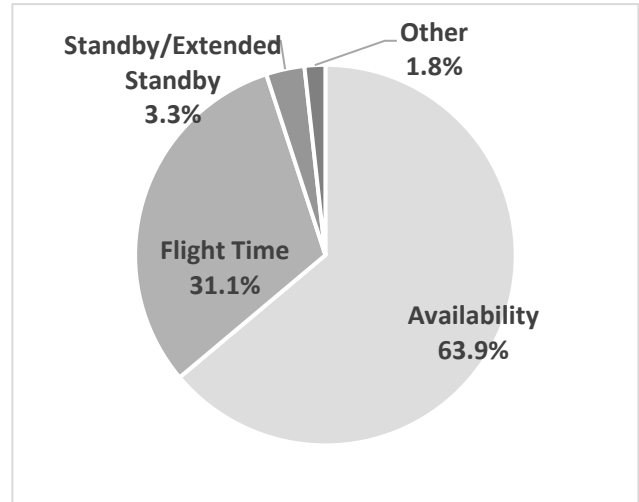
² Region/Agency derived from Incident Finance Job Codes from IBS data.

Aviation Costs

In CY 2022, agency expenditures for contract aircraft totaled \$789.7 million. More than half of all charges went to availability pay codes (63.9%). 31.1% went to flight time costs; remaining expenses were attributed to standby/extended standby (3.3%) and other pay codes (1.8%; Figure 4).

Figure 4 – CY 2022 Aviation Contract Costs by Pay Code Description

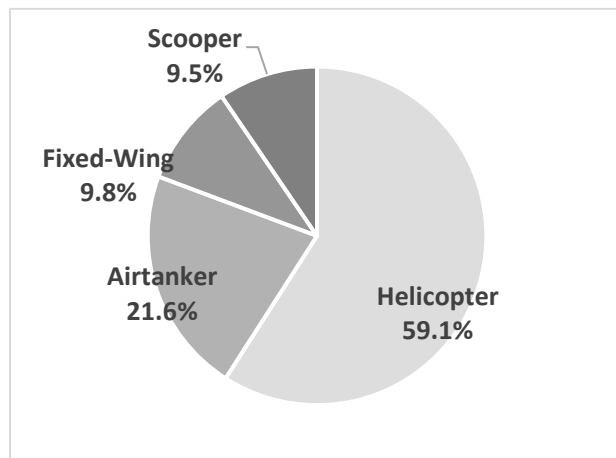
Pay Code Description	Total Costs
Availability	\$504,552,494
Flight Time	\$245,446,513
Standby/Extended Standby	\$25,748,438
Other	\$13,948,154
Total	\$789,695,600



Helicopters represented the bulk of expenditures at \$466.6 million, or 59.1% of total. Airtanker costs were roughly a fifth of the total (\$170.7 million, 21.6%), followed by fixed-wing (\$77.1 million, 9.8%) and scoopers (\$75.3 million, 7.3%; Figure 5).

Figure 5 – CY 2022 Aviation Contract Costs by Aircraft Type

Aircraft Type	Total Costs
Helicopter	\$466,565,935
Airtanker	\$170,740,427
Fixed-Wing	\$77,101,343
Scooper	\$75,287,894
Total	\$789,695,600



Fixed-Wing Aircraft

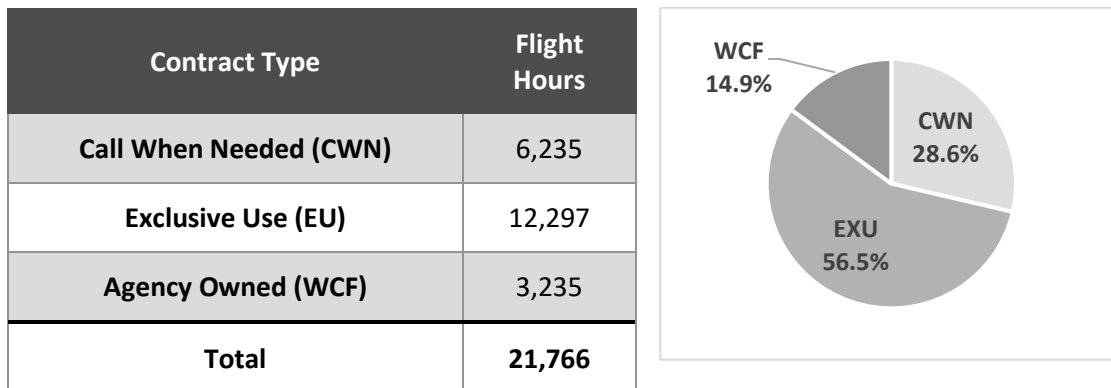
In 2022, the Forest Service utilized EU contracts for 56 fixed-wing aircraft to support various missions for smokejumper, leadplane, air attack, and transportation of firefighters. Approximately 77 additional fixed-wing aircraft were activated for use on CWN contracts. In addition to the contract aircraft, the Forest owns and operates 24 light-fixed-wing aircraft utilized for smokejumper, leadplane, and other natural resource management missions, such as Forest Health Protection (Table 3).

Table 3 – CY 2022 Fixed-Wing Fleet Summary

Aircraft Category	EU Aircraft	CWN Aircraft	WCF Aircraft
Smokejumper Aircraft	8	0	12
Aerial Supervision / Leadplane	42	13	1
Light Fixed-Wing	8	64	11
Transport Jet	1	0	0
Total	59	77	24

In 2022, fixed-wing aircraft flew 21,767 hours, which accounts for 35.9% of the annual total flight time. Over half of the fixed-wing flight time is from Exclusive Use (EU) aircraft (56.5%), 28.6% is from Call When Needed (CWN) planes, and 13.3% is from agency-owned (WCF) fixed-wing aircraft (Figure 6).

Figure 6 – CY 2022 Total Fixed-Wing Flight Time by Contract Type



A significant portion all fixed-wing flight time (43.0%) was spent supporting air attack missions in 2022. Lead plane (2,440 hours; 11.2%), infrared flight time (2,258 hours; 10.4%), and detection (1,579 hours; 7.3%) were the next highest mission codes billed for the year in IBS (Table 4).

Table 4 – CY 2022 Total Fixed-Wing Flight Time by Mission Code Description

Mission Code Description	Flight Hours	Percent of Total
Air Attack	9,360	43.0%
Infrared Imagery, fire suppression	2,258	10.4%
Lead Plane	2,440	11.2%
Lead Plane (Aerial Supervision Module)	599	2.8%
Detection (Flights for detecting wildfires)	1,579	7.3%
Smokejumper Operations	1,250	5.7%
Ferry	735	3.4%
Pilot Training	945	4.3%
Other	2,601	11.9%
Total	21,766	100%

Fixed-wing expenditures were \$82.0 million in 2022 (Table 5). 2022 annual costs were all above the 5-year averages despite the below average total flight hours.

Table 5 – CY 2018-2022 Total Contract Fixed-Wing Costs by Pay Code Description

Calendar Year	Flight Hours	Availability Costs (Millions USD)	Flight and Other Costs (Millions USD)	Total Costs (Millions USD)
2018	24,522	\$24.0	\$45.6	\$69.6
2019	17,827	\$25.7	\$26.0	\$51.8
2020	29,195	\$32.7	\$52.5	\$85.2
2021	26,249	\$32.8	\$45.1	\$77.9
2022	21,766	\$35.0	\$47.0	\$82.0
5-year average	23,912	\$30.0	\$43.2	\$73.3

Smokejumper Program

The seven smokejumper bases utilized 18 aircraft to staff 135 fires by parachute and made 724 fire jumps (Table 6). Additionally, the program delivered 119,539 pounds of para-cargo. The smokejumper program delivered critical supplies to fires nationwide utilizing traditional para-cargo and the Joint Precision Air Drop (JPAD) program.

Nationally, US Forest Service smokejumpers staffed 213 fires with 1,168 jumpers. In British Columbia, 78 fires were staffed by 338 American smokejumpers. Two Sherpas supported smokejumper operations from Ft. Saint John and McKenzie, BC.

Of the ten SD3-60 Sherpa's, eight were utilized to consistently staff five slots. The addition of a WCF manager and Sherpa Program Manager has increased the effectiveness of the Sherpa program. WCF aircraft flew a total of 1,217.7 hours while contracted aircraft flew 528.1 hours.

Thirty-three new smokejumpers were onboarded and trained while three experienced smokejumpers received additional training on the Ram-Air parachute. By the end of training season, 97% of the 279 smokejumpers were utilizing the Ram-Air parachute system.

Table 6 – CY 2021 Smokejumper Program Summary

Smokejumper Base	Region	Aircraft Make Model/ Vendor	SMJs Per Base	Fires Staffed by SMJs	Fire Jumps
Missoula	R1	(2) Sherpa SD3-60/USFS (1) Dornier 228/Bighorn	63	8	49
West Yellowstone	R1	(1) Dornier 228/Bighorn	29	1	4
Grangeville	R1	(1) DHC-6 Twin Otter/Leading Edge	27	4	49
McCall	R4	(2) DHC-6 Twin Otter/USFS	54	32	117
Redding	R5	(1) Sherpa SD3-60/USFS (1) Dornier 228/Bighorn	36	30	190
North Cascades	R6	(1) CASA 212/Bighorn	29	24	120
Redmond	R6	(2) Sherpa SD3-60/USFS (1) CASA 212/Bighorn CWN	41	36	195
		13 Aircraft	279	135	724

Helicopters

Historically, the agency has had 28 - Type 1, 34 - Type 2, and 50 - Type 3 helicopters on exclusive use contracts (EU). In 2022, the agency awarded 28 - Type 1 helicopter task orders through a competition amongst our Call When Needed (CWN) Agreement holders as substitute for the 28-Type 1 exclusive use helicopters that were not acquired by the continued development of the Multiple Award Task Order Contract (MATOC) acquisition. Table 7 illustrates the agency used 304 contracted helicopters on fire and natural resource management missions. The Airworthiness Branch approved over 500 helicopters. The actual number of aircraft utilized in 2022 differs from the Table 7 values due to dual contract awards (both EU and CWN for a single aircraft), vendor aircraft substitutions, or CWN aircraft unavailability.

Table 7 – CY 2022 Contract Helicopter Fleet Summary

Helicopter Category	EU Aircraft	CWN Aircraft	Total
Type 1	0	103	103
Type 2	32	32	64
Type 3	50	87	137
Total	82	222	304

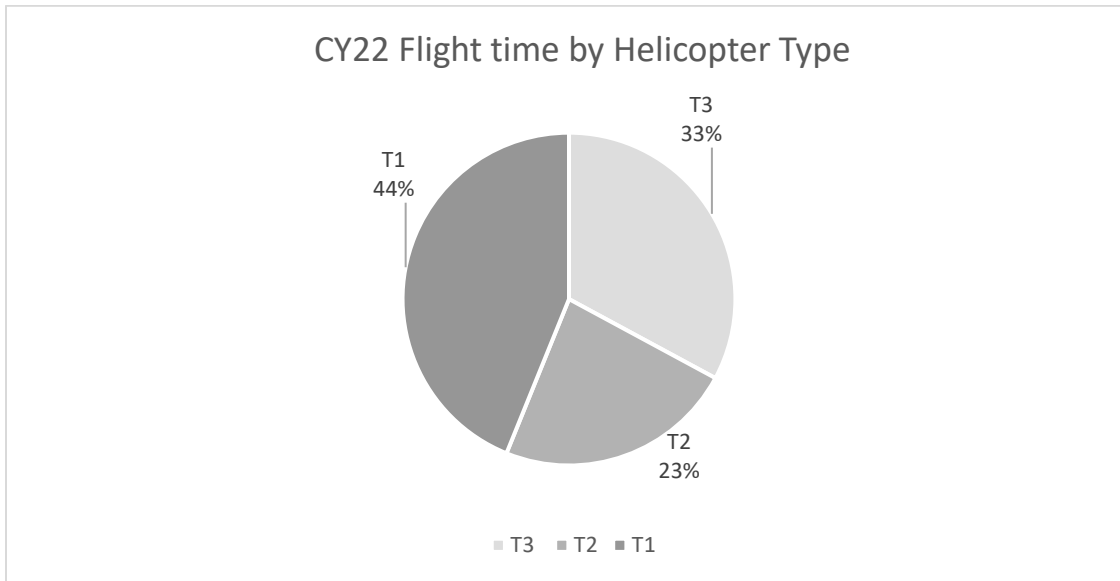
In total, there were 30,072 flight hours for helicopters in 2022. The volume of retardant and water delivered was 0.49 million and 80.3 million gallons respectively. There was also 6,070 gallons of gelled gasoline delivered during helitorch aerial ignition missions.

Table 8 – CY 2022 Helicopter Use Summary by Contract and Helicopter Type

Helicopter Type	Flight Hours	All Liquids (gallons)	Water (gallons)	Retardant (gallons)	Aerial Ignition Helitorch Gel (gallons)
Exclusive Use					
Type 1	0	0	0	0	0
Type 2	5,425.3	3,801,462	3,801,462	0	0
Type 3	7,049.9	1,366,289	1,360,474	0	5,815
EU Subtotal	12,475.2	5,167,751	5,161,936	0	5,815
Call When Needed					
Type 1	13,192.1	72,711,287	72,223,843	487,444	0
Type 2	1,567.6	2,444,225	2,436,865	7,360	0
Type 3	2,836.9	473,439	473,184	0	255
CWN Subtotal	17,596.6	75,628,951	75,133,892	494,804	255
Total	30,071.8	80,796,702	80,295,828	494,804	6,070

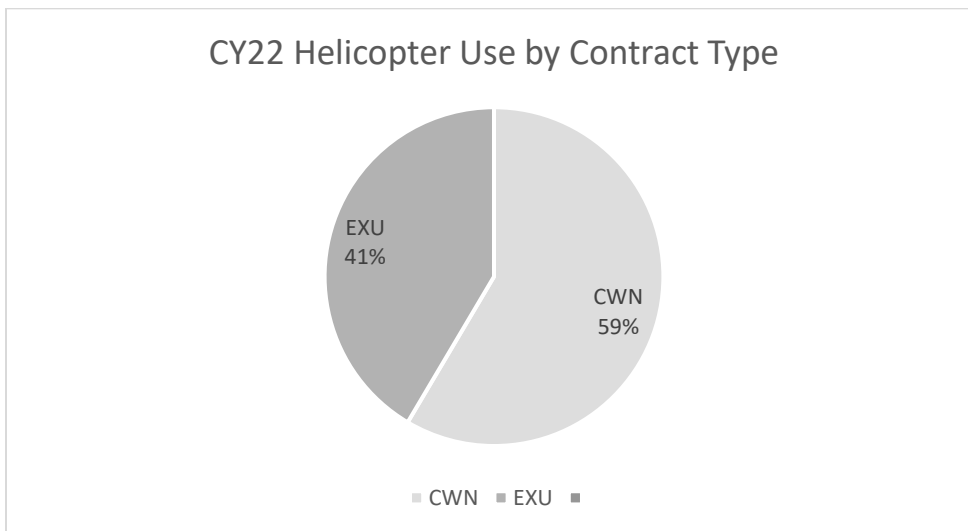
Type 1 helicopters flew the greatest percentage of hours, 44%, across the helicopter types.

Figure 7(a) – CY 2022 Total Helicopter Flight Hours by Type



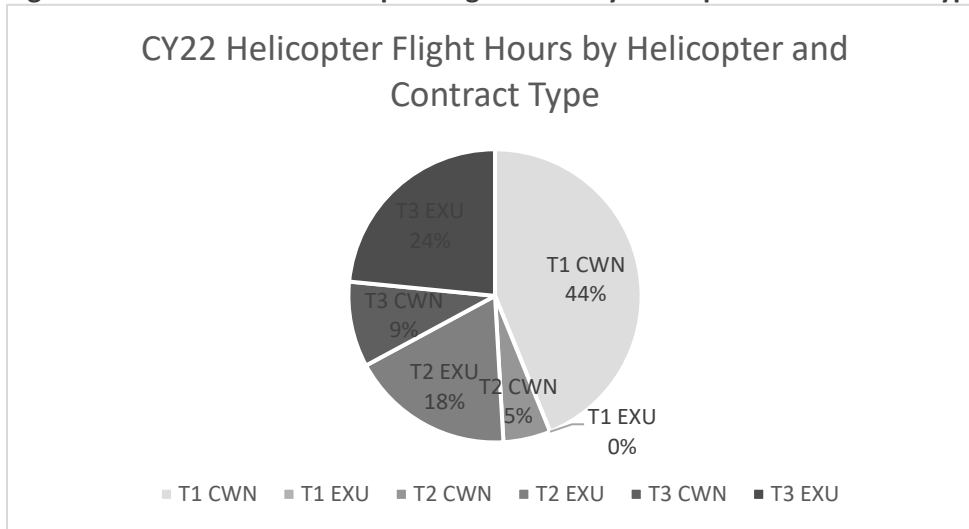
As expected CWN helicopters flew a higher percentage (59%) of hours than EXU helicopters due to no Type 1 EU contracts in place or awarded for 2022 and 103 – Type 1 CWN helicopters used.

Figure 7(b) – CY 2022 Total Helicopter Flight Hours by Contract Type



For similar reasons, it was foreseeable that Type 1 CWN helicopters would proportionally have higher flight use than the other helicopters by type and by contract (44%).

Figure 8 – CY 2022 Total Helicopter Flight Hours by Helicopter and Contract Type



Total helicopter expenditures in CY 2022 were \$466.6 million which is 125% above the 5-year average of \$373.5 million (Table 9). A significant portion of this increase in costs were because all the Type 1 helicopters were CWN aircraft which have higher daily availability rates than EU aircraft.

Table 9 – CY 2018-2022 Contract Helicopter Use and Costs Summary

Calendar Year	Flight Hours	Availability Costs (Millions USD)	Flight and Other Costs (Millions USD)	Total Costs (Millions USD)
2018	39,892	\$198.0	\$141.0	\$339.0
2019	20,588	\$145.2	\$64.3	\$209.5
2020	42,667	\$251.0	\$151.4	\$402.4
2021	43,272	\$265.5	\$184.3	\$449.9
2022	30,072	\$319.5	\$147.1	\$466.6
5-yr avg.	35,298	\$235.8	\$137.6	\$373.5

For Type 1 helicopters, costs increased for similar reasons as the total costs. Type 1 expenditures (\$351.0 million) were 135% higher in 2022, compared to the 5-year average (\$259.4 million) (Table 10). \$248.8 million, or 70.9% of Type 1 costs were attributed to the expense of daily availability in 2022. The daily availability percentage of total costs is 152% higher than the 5-year average, however the total costs for 2022 is 9% higher than the year nearest in total cost (2021).

Table 10 – CY 2018-2022 Contract Type 1 Helicopter Use and Costs Summary

Calendar Year	Flight Hours	Availability Costs (Millions USD)	Flight and Other Costs (Millions USD)	Total Costs (Millions USD)
2018	15,914	\$131.9	\$93.8	\$225.6
2019	5,397	\$89.9	\$35.6	\$125.6
2020	19,434	\$163.1	\$109.2	\$272.3
2021	23,228	\$186.3	\$136.2	\$322.5
2022	13,192	\$248.8	\$102.3	\$351.0
5-yr avg.	15,433	\$164.0	\$95.4	\$259.4

In 2022, 71.9% of Contract Type 1 Helicopter use by flight time was in support of Forest Service fires (derived from IBS job codes). The bulk of the remaining 28.1% of use on non-agency fires went to state and local cooperators (16.3%) and the Department of Interior (11.7%; Table 11).

Table 11 – CY 2022 Contract Type 1 Helicopter Flight Time by Region/Agency³

Region/Agency	Flight Hours	Percent of Flight Hours
FS: Region 1	1,036.5	7.9%
FS: Region 2	140.6	1.1%
FS: Region 3	2,727.8	20.7%
FS: Region 4	1,409.0	10.7%
FS: Region 5	1,165.4	8.8%
FS: Region 6	2,493.4	18.9%
FS: Region 8	58.0	0.4%
FS: Region 9	0.0	0.0%
FS: Region 10	0.0	0.0%
FS: Region 13 (WO)	448.7	3.4%
FS Total	9,479.4	71.9%
BIA	462.8	3.5%
BLM	595.8	4.5%
FWS	0.0	0.0%
NPS	485.0	3.7%
DOI Total	1,543.6	11.7%
Non-Fed Fire (State)	2,149.8	16.3%
Other	19.3	0.1%
Grand Total	13,192	100.0%

³ Region/Agency derived from Incident Finance Job Codes from IBS data.

T2 helicopter expenditures (\$66.1) were \$1.2 million above the 5-year average and total flight hours were 88% of the 5-year average (Table 12).

Table 12 – CY 2018-2022 Contract Type 2 Helicopter Use and Costs Summary

Calendar Year	Flight Hours	Availability Costs (Millions USD)	Flight and Other Costs (Millions USD)	Total Costs (Millions USD)
2018	10,198	\$39.5	\$25.3	\$64.8
2019	5,690	\$34.2	\$14.3	\$48.5
2020	11,264	\$54.6	\$25.6	\$80.2
2021	5,379	\$40.9	\$23.9	\$64.8
2022	6,993	\$42.2	\$23.9	\$66.1
5-yr avg.	7,905	\$42.3	\$22.6	\$64.9

In 2022, Type 3 helicopter costs (\$49.4 million) were consistent with the 5-year average (\$49.2 million). Total flight hours in 2022 fell 17% below the 5-year average and was the second lowest in the last five years. Total Type 3 helicopter costs nearly matched the second highest year (2020) (Table 13). These flight hour values indicate good utilization of the Type 3 helicopter fleet.

Table 13 – CY 2018-2022 Contract Type 3 Helicopter Use and Costs Summary

Calendar Year	Flight Hours	Availability Costs (Millions USD)	Flight and Other Costs (Millions USD)	Total Costs (Millions USD)
2018	13,780	\$26.7	\$21.9	\$48.5
2019	9,501	\$21.1	\$14.4	\$35.5
2020	11,969	\$33.3	\$16.6	\$49.9
2021	14,096	\$38.3	\$24.1	\$62.5
2022	9,889	\$28.5	\$20.9	\$49.4
5-yr avg.	11,847	\$29.6	\$19.6	\$49.2

Rappel Program

In 2022, the USFS Rappel Program had 14 aircraft across 11 bases in 4 Regions, staffed by 242 rappellers. Rappellers supported 213 IA fires by rappel and 162 IA fires in a helitack. Additionally, 76 large fires were supported by rappel crews. Aircraft flew 2851.8 flight hours supporting operations in 2022 (Table 14).

Table 14 – CY 2022 Rappel Program Use Summary

Base	Region	Aircraft	Rappellers	Fires (Rappel)	Fires (Helitack)	Large Fires Supported	Flight Time
Gallatin	R1	33HX	19	21	21	10	321
Libby	R1	37HX	17	17	13	7	225
Lucky Peak	R4	205BD	11	NA	12	7	201.8
Salmon 1	R4	205LM	17	16	12	3	172.8
Salmon 2	R4	933CH	17	18	13	2	167.8
Price Valley 1	R4	669H	12	18	13	4	220.5
Price Valley 2	R4	679H	13	17	14	4	233.9
Trimmer	R5	FHQB	14	14	16	1	169.1
La Grande 1	R6	404HA	16	15	4	3	190.1
La Grande 2	R6	223HT	16	16	4	3	228.1
Wenatchee	R6	205RH	23	19	9	20	221.6
John Day	R6	89H	24	11	7	4	269.8
Siskiyou	R6	28HX	20	11	6	5	91.6
Central OR	R6	205DY	23	20	18	3	138.7
			242	213⁴	162⁴	76	2,851.8

⁴ 355 IA Fires Staffed

Short-haul Program

In 2022 the Short-haul Program consisted of 71 crew members assigned to five different aircraft, located at six bases in four different regions. Wenatchee Airbase did not have a helicopter due to the helicopter company choosing not to extend their contract. The program logged 1,080 flight hours for the year. Short-haul crews performed 676 proficiency short-hauls, 251 operational short-hauls and responded to 71 IA fires and 34 large fires (Table 15).

Table 15 – CY 2022 Short-haul Program Summary

Base	Region	Aircraft	Crew Size	Proficiency Evolutions	Operational Evolutions	Operational Missions	Patients Rescued	Initial Attack Fires	Large Fire Support	Total Flight Hours
Tucson Helitack	R3	N350HQ ⁵	9	53	0	0	0	9	11	134.5
Helena Av. Center	R1	N350HQ	8	65	3	1	1	20	4	141.8
Teton Helitack (2 Helicopters)	R4	N35HX & N38HX	22	189	2	1	1	25	12	422.0
McCall/Krassel	R4	N353SH	14	65	0	0	0	17	7	233.9
Wenatchee Airbase	R6	N/A ⁶	6	24 ⁷	0	0	0	0	0	N/A
California LE&I Program	R5	N407WF	12	280	246	246	N/A	N/A	N/A	148.1
TOTALS			71	676	251	248	2	71	34	1,080

⁵ Tucson and Helena share a contract.

⁶ Wenatchee Airbase did not have a contracted helicopter for CY2022.

⁷ Wenatchee performed proficiencies with other short-haul crews when able.

Airtankers

In 2022, the Forest Service had 18 airtankers available under Exclusive Use and five available under Call-When-Needed (CWN) contracts. The three Exclusive Use contracts consisted of 16 LATs and two VLATs. There were five airtankers brought on under a 120-day Surge utilizing the Call-When-needed contract, three LATs and two VLATs. There were occasions when we activated additional CWN airtankers, however they were day-to-day with no guarantee. Two MAFFS units were utilized for surge capacity needs. One airtanker from New South Wales was brought over on a foreign government agreement to add to the surge capacity.

Table 16 – CY 2022 Airtanker Fleet Summary

Aircraft Category	EU Aircraft	CWN Aircraft
Large and Very Large Airtankers	18	5
MAFFS	0	2

Contract airtankers logged 6,375 flight hours in 2022, a 17% reduction from 2021 (7,677) and 10.5% of the Agency’s total calendar year use flight time billed in IBS. Contract airtankers also delivered approximately 21.3 million gallons of retardant, with 66.4% of total delivered by LATs and 33.6% by VLATs (Table 17).

Table 17 – CY 2022 Airtanker Use Summary by Aircraft and Contract Type

Airtanker Type	Flight Hours	Retardant (gallons)
Exclusive Use		
VLAT	654.3	4,169,749
LAT	4,721.6	12,910,564
<i>EU Subtotal</i>	5,375.9	17,107,313
Call When Needed		
VLAT	484.6	2,965,486
LAT	514.0	1,232,018
<i>CWN Subtotal</i>	998.6	4,197,504
Total Airtanker Use	6,374.5	21,304,817

In 2022, 48.5% of use by flight time was in support of Forest Service fires (derived from IBS job codes). The bulk of the remaining 51.5% of use on non-agency fires went to state and local cooperators (34.6%) and the Department of Interior (16.6%; Table 18).

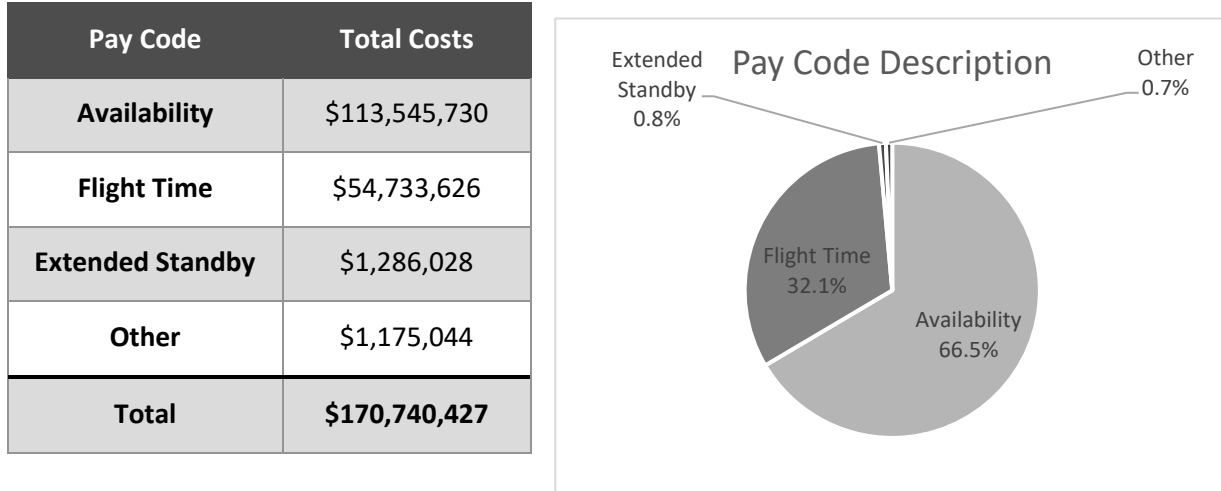
Table 18 – CY 2022 Airtanker Flight Time by Region/Agency⁸ (LAT/VLAT)

Region/Agency	Flight Hours	Percent of Flight Hours
FS: Region 1	188.2	3.0%
FS: Region 2	146.7	2.3%
FS: Region 3	1,312.4	20.6%
FS: Region 4	392.7	6.2%
FS: Region 5	662.9	10.4%
FS: Region 6	284.8	4.5%
FS: Region 8	40.1	0.6%
FS: Region 9	0	0.0%
FS: Region 10	10.1	0.2%
FS: Region 13 (WO)	53.6	0.8%
FS Total	3,091.5	48.5%
BIA	494.6	7.8%
BLM	488.9	7.7%
FWS	0	0.0%
NPS	71.7	1.1%
DOI Total	1,055.2	16.6%
Non-Fed Fire (State)	2,207.4	34.6%
Other	20.4	0.3%
Grand Total	6,374.5	100.0%

⁸ Region/Agency derived from Incident Finance Job Codes from IBS data.

Contract LAT/VLAT expenditures were \$170.7 million in CY 2022. Availability charges totaled \$113.5 million (66.5%), and flight time costs were \$54.7 million (32.1%). Standby and other expenses accounted for the remaining costs (\$2.5 million, 1.5%; Figure 9). All LAT/VLAT expenditures (not including scoopers) represented 21.6% of total agency aircraft expenditures billed in IBS.

Figure 9 – CY 2022 Contract LAT/VLAT Costs by Pay Code Description



For EU airtankers, the BAe-146 just edged out the RJ85 aircraft for the most flight hours in 2022 (1,756.6 and 1,706.6 hours respectively). In addition, the DC-10 and MD-87 aircraft both flew over 1,000 hours. RJ85 aircraft had the highest availability cost (\$31.4 million). DC-10 aircraft delivered the most retardant (7.2 million gallons; Table 19).

Table 19 – CY 2022 EU Contract LAT/VLAT Use Summary by Aircraft Model

Aircraft Model	Flight Hours	Retardant (gallons)	Availability Costs
BAe-146	1,756.6	4,934,307	\$26,008,122
RJ85	1,706.6	3,812,210	\$31,369,343
DC-10	1,139.0	7,162,235	\$21,752,512
MD-87	1,189.2	3,607,265	\$20,569,146
EC-130Q	252.4	725,465	\$4,027,107
B-737	330.8	1,063,335	\$9,819,500
Total	6,374.5	21,304,817	\$113,545,730

Tables 19-22 summarize historical airtanker use by year, aircraft type, and contract category. These summaries do not include Modular Airborne Fire Fighting Systems (MAFFS) or cooperator airtanker use data. Compared to the five prior years, 2022 EU LAT total flight time (4,724 hours) and retardant gallons delivered (12.9 million gallons) were above average (Table 20). EU VLATs saw a decrease as both total flight time (654 hours) and retardant gallons (4.2 million gallons) were below the 5-year average values (Table 21).

Table 20 – CY 2018-2022 EU LAT Use Summary

Calendar Year	Flight Hours	Retardant (gallons)
2018	4,021	12,976,364
2019	2,273	7,081,902
2020	4,229	12,632,713
2021	5,355	16,823,549
2022	4,724	12,910,564
5-yr average	4,120	12,485,018

Table 21 – CY 2018-2022 EU VLAT Use Summary

Calendar Year	Flight Hours	Retardant (gallons)
2018	678	5,178,692
2019	491	3,768,052
2020	943	5,538,281
2021	892	6,772,587
2022	654	4,196,749
5-yr average	732	5,090,872

CWN airtankers were used not as extensively in 2022. LAT flight time (514 hours) and gallons (1.2 million) were both well below the 5-year average (Table 22). CWN VLATs flew slightly above average levels (514 hours) while retardant totals were consistent with the 5-year average (Table 23).

Table 22 – CY 2018-2022 CWN LAT Use Summary

Calendar Year	Flight Hours	Retardant (gallons)
2018	1,196	4,194,568
2019	608	2,047,461
2020	3,707	11,706,065
2021	757	2,445,884
2022	514	1,232,018
5-yr average	1,356	4,325,199

Table 23 – CY 2018-2022 CWN VLAT Use Summary

Calendar Year	Flight Hours	Retardant (gallons)
2018	291	1,970,183
2019	55	316,319
2020	570	4,042,116
2021	673	5,308,491
2022	485	2,965,486
5-yr average	414.8	2,920,519

MAFFS

The Forest Service utilizes military C-130 aircraft with a Modular Airborne Fire Fighting System (MAFFS) to support surge capacity mission needs. The totals represented in the summary tables shown are not included elsewhere in this report because MAFFS aircraft do not report their flight hours into IBS for payment. Following 2021, MAFFS saw decreased use in 2022 with only two aircraft operationally activated in September. There were 14.3 hours of annual flight time for fire support to deliver 16,700 gallons of retardant, at a cost of \$430 thousand (Table 24). Including certification flights, total program costs in 2022 were approximately \$3.8 million (Table 26).

Table 24 – CY 2018-2022 MAFFS Summary of Activation on Fires

Calendar Year	Flight Hours	Retardant (gallons)	Total Costs
2018	332.9	798,319	\$5,125,915
2019	0	0	0
2020	599.2	1,369,108	\$8,341,585
2021	944.8	2,588,594	\$15,422,340
2022	14.3	16,700	\$430,448
5-Year Average	378.2	954,544	\$5,864,058

Table 25 – CY 2018-2022 MAFFS Total Use Summary (Including Certification and Activation on Fires)

Calendar Year	Flight Hours	Total Costs
2018	502.4	\$7,788,186
2019	118.1	\$1,942,898
2020	698.7	\$10,047,121
2021	1,117.2	\$18,335,102
2022	198.0	\$3,762,047
5-Year Average	526.9	\$8,375,071

Table 26 – CY 2018-2022 MAFFS Costs by Charge Category

Calendar Year	Certification Costs	Fire Activation Costs	Total Costs
2018	\$2,662,271	\$5,125,915	\$7,788,186
2019	\$1,942,898	0	\$1,942,898
2020	\$1,705,536	\$8,341,585	\$10,047,121
2021	\$2,912,762	\$15,422,340	\$18,335,102
2022	\$3,331,599	\$430,448	\$3,762,047
5-Year Average	\$2,511,013	\$5,864,058	\$8,375,071

Multi-engine Water Scoopers

The Forest Service contracted a total of nine multi-engine water scoopers between April 24, 2022 and Sept 24, 2022 on the CWN/MATOC contract. These aircraft collectively flew 2,406 hours or 180% of the 5-year average. Total costs in IBS were \$75.3 million, and the aircraft delivered nearly 12.3 million gallons of water. Almost half (49%) of the total costs, or \$36.6 million, were attributed to aircraft availability charges.

Table 27 – CY 2022 Multi-engine Water Scooper Fleet Summary

Aircraft Category	EU Aircraft	CWN Aircraft
Water Scoopers	0	9

Table 28 – CY 2018-2022 Multi-engine Water Scooper Use Summary

Calendar Year	Flight Hours	Water Delivered (gallons)	Availability Costs (Millions USD)	Flight and Other Costs (Millions USD)	Total Costs (Millions USD)
2018	1,609	8,795,257	\$27.8	\$23.0	\$50.8
2019	679	3,292,206	\$12.5	\$9.9	\$22.5
2020	1,432	6,253,548	\$28.8	\$21.7	\$50.5
2021	1,598	9,783,949	\$28.2	\$27.0	\$55.3
2022	2,406	12,281,958	\$36.6	\$38.7	\$75.3
5-yr avg.	1,330	8,081,384	26.8	24.1	50.9

In 2022, 76.6% of Multi-engine Water Scooper use by flight time was in support of Forest Service fires (derived from IBS job codes). The bulk of the remaining 23.4% of use on non-agency fires went to state and local cooperators (7.6%) and the Department of Interior (15.8%; Table 29).

Table 29 – CY 2022 Multi-engine Water Scooper Flight Time by Region/Agency⁹

Region/Agency	Flight Hours	Percent of Flight Hours
FS: Region 1	-	-
FS: Region 2	-	-
FS: Region 3	992.2	41.2%
FS: Region 4	511.6	21.3%
FS: Region 5	33.8	1.4%
FS: Region 6	129.6	5.4%
FS: Region 8	-	-
FS: Region 9	-	-
FS: Region 10	-	-
FS: Region 13 (WO)	176.2	7.3%
FS Total	1,843.3	76.6%
BIA	277.2	11.5%
BLM	101.8	4.2%
FWS	-	-
NPS	-	-
DOI Total	379.0	15.8%
Non-Fed Fire (State)	182.0	7.6%
Other	2.1	0.1%
Grand Total	2,406	100.0%

⁹ Region/Agency derived from Incident Finance Job Codes from IBS data.

Unmanned Aircraft Systems (UAS) Program

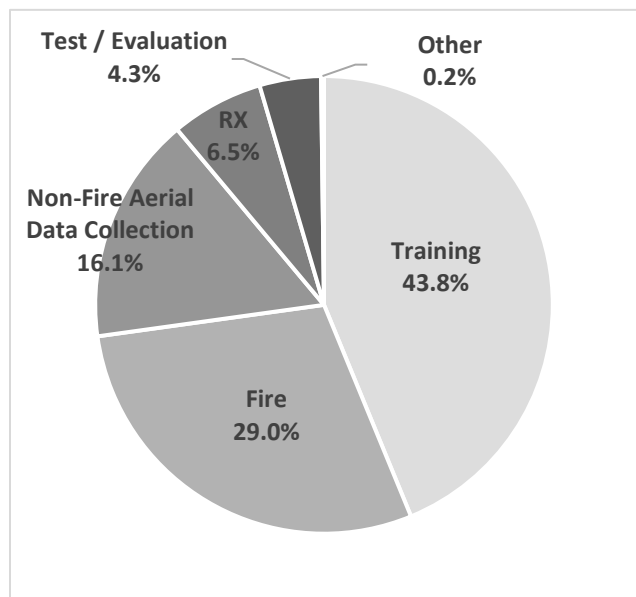
In 2022, the UAS program onboarded AlarisPro, a new fleet management and activity tracking tool. 2022 was the first year that the Forest Service occupied a majority of all seats available within the training calendar. 2022 shall be considered as baseline data of the program across all regions now that the agency has the necessary cadre, acquisition contracts for approved fleet, as well as national/regional oversight and management positions filled. Prior years there were UAS activities occurring, but activities and missions were not across all regions. Nearly 70% (138) of the agency’s 202 current UAS pilots were initially trained during 2022.

Testing and evaluation continued to occur to find domestic UAS manufactures that can meet agency requirements. Finding a smaller flying aircraft with infrared and a quality mapping sensor is proving to be difficult with a domestic investment strategy. The larger UAS aerial ignition platform and payload experienced significant growth in utilization and the first aerial ignition academy was delivered.

UAS utilization continued to expand within resource management applications. Overall, in CY22 there were 5,808 flights totaling 1,412.4 flight hours (Figure 10).

Figure 10 – CY 2022 UAS Use Summary by Mission Description

Mission Type	Flight Hours
Training	618.5
Fire	409.8
Non-Fire Aerial Data Collection	227.5
RX	92.5
Test / Evaluation	61.3
Other	2.9
Total	1,412.4



Agency-Owned Aircraft Summary

The Forest Service owned and operated 24 aircraft in 2022. Agency aircraft accounted for 3,234.8 (5.3%) of the 60,619 total flight hours billed in IBS in 2022 (Table 30).

Table 30 – CY 2022 Agency Aircraft Use Summary by Aircraft Make and Model

Registration #	Make	Model	Flight Hours
N106FS	DEHAVILLAND	DHC-2 BEAVER	37.8
N191Z	DEHAVILLAND	DHC-2 BEAVER	142.3
N192Z	DEHAVILLAND	DHC-2 BEAVER	191.7
N193Z	DEHAVILLAND	DHC-2 BEAVER	106.4
N142Z	SHORT BROS	SD3-60 SHERPA	82.6
N114Z	SHORT BROS	SD3-60 SHERPA	37.7
N145Z	SHORT BROS	SD3-60 SHERPA	186.7
N148Z	SHORT BROS	SD3-60 SHERPA	99.5
N161Z	SHORT BROS	SD3-60 SHERPA	74.3
N162Z	SHORT BROS	SD3-60 SHERPA	172.1
N163Z	SHORT BROS	SD3-60 SHERPA	11.3
N174Z	SHORT BROS	SD3-60 SHERPA	44.7
N176Z	SHORT BROS	SD3-60 SHERPA	29.8
N110Z	SHORT BROS	SD3-60 SHERPA	86.7
N141Z	DEHAVILLAND	DHC-6-300	216.3
N143Z	DEHAVILLAND	DHC-6-300	289.6
N166Z	CESSNA	CE-206-G	121.5
N111Z	CESSNA	206 STATIONAIR-6	104.0
N125Z	QUEST	KODIAK 100	97.3
N160Z	QUEST	KODIAK 100	180.7
N115Z	BEECH	B200GT	30.2
N147Z	BEECH	B200GT	280.6
N149Z	BEECH	KING AIR 200	576.7
N181Z	BEECH	B200GT	34.3
Total			3,234.8

5-year Aviation Summary Trends and Averages

Total flight time for scoopers saw a significant jump in 2022 while all other aircraft types were below the 5-year averages (Table 31). These numbers reflect some reprieve from previous more extreme fire seasons while still maintaining adequate demand.

Table 31 – CY 2018-2022 Flight Hours by Aircraft Type

Calendar Year	Fixed-Wing	Helicopter	Airtanker	Scooper	Total
2018	27,768	40,589	6,264	1,609	76,230
2019	17,827	20,579	3,485	679	42,570
2020	29,195	43,248	9,449	1,432	83,324
2021	26,249	45,791	7,678	1,598	81,487
2022	21,766	30,072	6,375	2,406	60,619
5-Yr Avg.	24,561	36,056	6,650	1,545	68,846

In 2022, passenger and cargo totals from all aircraft were both below the 5-year average. Passenger transport was an outlier for what in recent years has seen little deviation (Table 32).

Table 32 – CY 2018-2022 Passenger and Cargo Summary (All Aircraft)

Calendar Year	Flight Hours	# of Passengers	Cargo Weight (lbs.)
2018	76,230	79,926	16,308,212
2019	42,570	72,295	12,814,010
2020	83,324	77,444	20,645,311
2021	81,487	74,819	25,508,170
2022	60,619	62,168	15,458,847
5-Yr Avg.	68,846	73,330	18,146,910

Total retardant delivery at 21.7 million gallons was below the 5-year average of 26.8 million gallons. There is no discernible trend in retardant delivery totals from the last five years (Table 33).

Table 33 – CY 2018-2022 Total Retardant Delivered (All Aircraft)

Calendar Year	Retardant (gallons)
2018	27,282,194
2019	13,515,907
2020	37,521,892
2021	33,930,105
2022	21,741,430
5-Yr Average	26,798,306

The total aviation contract costs in 2022 (\$794.6 million) showed a 5.7% increase compared to 2021. Despite a drop in overall usage, the year still represented exceptional challenges, and subsequently, demand and related expenditures were well above average (Table 34).

Table 34 – CY 2018-2022 Total Contract Aviation Costs¹⁰

Calendar Year	Availability Costs (Millions USD)	Flight and Other Costs (Millions USD)	Total Costs (Millions USD)
2018	\$344.9	\$262.1	\$607.0
2019	\$264.3	\$133.3	\$397.5
2020	\$435.7	\$310.8	\$746.4
2021	\$428.4	\$323.1	\$751.4
2022	\$504.6	\$290.0	\$794.6
5-Yr Avg.	\$395.6	\$263.9	\$659.4

¹⁰ Total contract cost is derived from IBS. Total availability cost includes deductions for non-availability.