

Purpose and Need for Initial F-22 Operational Wing Beddown

Chapter 1



How to Use This Document

Our goal is to give you a reader-friendly document that provides an in-depth, accurate analysis of the proposed action, the alternative beddown locations, the no-action alternative, and the potential environmental consequences for each base. The organization of this Draft Environmental Impact Statement, or Draft EIS, is shown below.

Overall Proposal

Preface

Detailed Guide for Reading the Draft EIS

→ Go back to the Preface for a detailed guide for reading the Draft EIS.

Chapter 1

Purpose and Need for the Initial F-22 Operational Wing Beddown

→ Chapter 1 explains the decision made by Congress to provide the Air Force with a next-generation fighter to replace and supplement the aging F-15C fleet. Also described are the features of the F-22 Raptor that make it superior to the F-15C, how the F-22 will be based, and how aircrews will train for their operational assignments.

Chapter 2

- Overview of the Proposed Action and Alternatives
- Alternative Identification Process
- Summary Comparison of Proposed Action and Alternatives

→ Go to Chapter 2 for an overview of the proposed action and alternatives.

Information Specific to Each Base

Chapter 3

Five Base-Specific Sections

Langley AFB

Section LA1
Proposed
Action
Overview

Section LA2
Base-Specific
Project Details

Section LA3
Affected
Environment
and
Environmental
Consequences

Section LA4
Cumulative
Effects,
Irreversible, and
Irretrievable
Commitment of
Resources

Section LA5
Summary of
Proposed
Management
Actions

Eglin AFB

Section EG1
Alternative
Overview

Section EG2
Base-Specific
Project Details

Section EG3
Affected
Environment
and
Environmental
Consequences

Section EG4
Cumulative
Effects,
Irreversible, and
Irretrievable
Commitment of
Resources

Section EG5
Summary of
Proposed
Management
Actions

Elmendorf AFB

Section EL1
Alternative
Overview

Section EL2
Base-Specific
Project Details

Section EL3
Affected
Environment
and
Environmental
Consequences

Section EL4
Cumulative
Effects,
Irreversible, and
Irretrievable
Commitment of
Resources

Section EL5
Summary of
Proposed
Management
Actions

Mtn Home AFB

Section MH1
Alternative
Overview

Section MH2
Base-Specific
Project Details

Section MH3
Affected
Environment
and
Environmental
Consequences

Section MH4
Cumulative
Effects,
Irreversible, and
Irretrievable
Commitment of
Resources

Section MH5
Summary of
Proposed
Management
Actions

Tyndall AFB

Section TY1
Alternative
Overview

Section TY2
Base-Specific
Project Details

Section TY3
Affected
Environment
and
Environmental
Consequences

Section TY4
Cumulative
Effects,
Irreversible, and
Irretrievable
Commitment of
Resources

Section TY5
Summary of
Proposed
Management
Actions

Overall Proposal

Chapter 4

References

Volume 2

Chapter 5

List of Preparers

Volume 2

Chapter 6

Index

Volume 2

Appendices

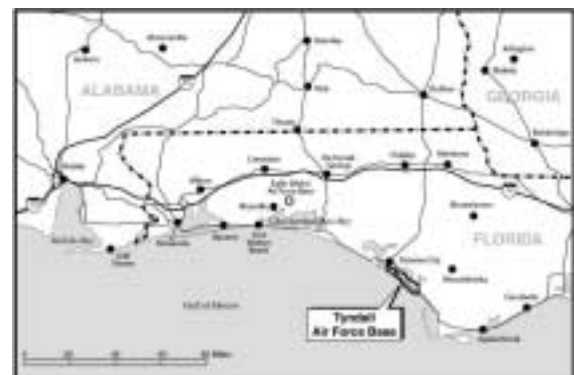
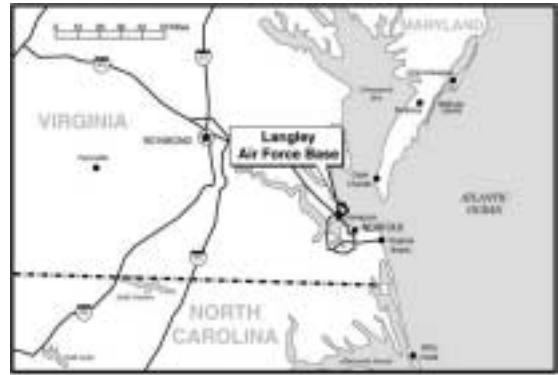
Volume 2

Glossary, Acronyms and Abbreviations

1 **PURPOSE AND NEED FOR INITIAL F-22 OPERATIONAL WING BEDDOWN**

In 1985, Congress determined that a need existed to provide the United States Air Force (Air Force) with a next-generation fighter to replace and supplement the aging F-15C fleet and to ensure air dominance well into the 21st century. Congress also determined that the F-22 would meet this need. The Air Force now proposes to establish (beddown) the Initial Operational Wing of F-22 Raptors at Langley Air Force Base (AFB), Virginia. As required by the National Environmental Policy Act (NEPA), the Environmental Impact Statement (EIS) also analyzes alternatives to the proposed action. For this proposal, four alternative Air Force bases are analyzed; those bases are Eglin AFB, Florida; Elmendorf AFB, Alaska; Mountain Home AFB, Idaho; and Tyndall AFB, Florida. The no-action alternative is also analyzed.

The beddown would involve basing 72 Primary Aircraft Inventory (PAI) and 6 Backup Aircraft Inventory (BAI) operational F-22 aircraft, construction of and modifications to facilities, personnel changes, and aircraft operations.



The maps on this page show the locations of the proposed base for the F-22 beddown (Langley AFB, Virginia) and the four alternative bases.

1.1 Background

The F-22 Raptor is designed to ensure that America's armed forces retain air dominance. This means complete control of the airspace over an area of conflict, thereby allowing freedom to attack and freedom from attack at all times and places for the full spectrum of military operations. Air dominance provides the ability to defend our forces from enemy attack and to attack adversary forces without hindrance from enemy aircraft. During the initial phases of deployment into an area of conflict, the first of our aircraft to arrive are the most vulnerable because they face the entire warfighting capability of an adversary. The F-22's state-of-the-art technology, advanced tactics, and skilled aircrew will ensure air dominance from the outset of such situations.

The Air Force faces two challenges to providing air dominance with its current fleet of fighter aircraft. First, other nations continuously improve their aerial warfare capability by fielding newer, faster, more maneuverable aircraft, such as the MiG-29, Su-35, Rafale, Gripen, and Eurofighter. Second, potential adversaries have added sophisticated air defenses built around surface-to-air missiles that can target conventional aircraft more accurately and at greater distances than in the past. The F-22 has the stealth, speed, and maneuverability to overcome these challenges and ensure air dominance over any battlefield.

The Air Force priority is to be equipped, trained, and ready to fulfill its combat missions as directed by the President and Secretary of Defense. The Air Force needs F-22 aircraft to replace and supplement the aging and vulnerable F-15C fleet currently tasked with providing air superiority. The Initial F-22 Operational Wing is needed to fulfill the Air Force's mission responsibilities, including worldwide deployment.

1.1.1 Aircraft Characteristics of the F-15C

The F-15C Eagle, an air superiority fighter, was developed in 1965 and attained initial operational capability in 1976. The aircraft was developed to arrive early during a battle, dominate enemy aircraft, and control access to the battle from the sky. Overall, these missions were performed frequently for short durations, with rapid airfield maintenance and quick turnaround times. During

Desert Storm, the F-15C aircraft flew longer missions, refueled in flight, and provided air superiority over the battlefield to engage enemy aircraft while escorting other aircraft.



The F-15C is armed with the AIM-7M Sparrow or AIM-120 Advanced Medium-Range Air-to-Air Missiles (AMRAAM), the AIM-9M Sidewinder, and a 20-millimeter cannon.

The F-15C routinely operates at medium altitudes (20,000 to 30,000 feet above mean sea level [MSL]) and flies missions up to 2 hours in duration with aerial refueling. Powered by two engines that each provide 18,000 pounds of thrust, the F-15C achieves speeds in excess of 1,650 miles per hour. In normal air-to-air combat modes, the F-15C uses power settings ranging from above 90

percent to afterburner. F-15Cs generally use afterburner to achieve supersonic speeds. The F-15C is 64 feet long, with a wingspan of 43 feet, and is over 18 feet in height.

An afterburner is a device that burns fuel within the pipe of a jet engine to increase thrust.

1.1.2 Aircraft Characteristics of the F-22

The F-22 is designed to replace and supplement the F-15C fleet. The F-22 offers a unique combination of capabilities that make it faster, more fuel efficient, more maneuverable, more reliable, and less detectable than the F-15C. These capabilities enable the F-22 to reach the conflict faster, reduce danger to pilots, and provide more air power to the combat commander. The enhanced capabilities include the following:

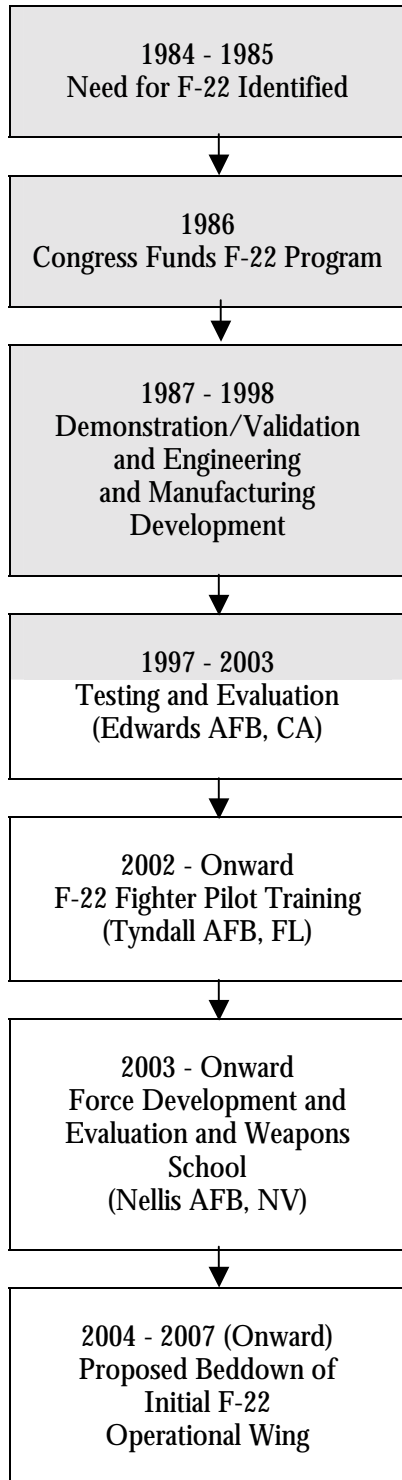
- **Stealth:** State-of-the-art design and radar-absorbent composite materials make the F-22 harder to detect by radar than conventional aircraft of similar size.
- **Supersonic speed:** The F-22 can sustain supersonic speeds without the use of afterburners (an afterburner greatly increases fuel consumption). This permits the F-22 to operate longer at higher speeds and with less vulnerability to other aircraft and missiles.
- **Increased maneuverability:** The design, coupled with the ability to direct engine thrust, permits an F-22 pilot to turn more rapidly, maintain better control, and evade missile threats better than other fighter aircraft.
- **Advanced electronics:** Highly sophisticated avionics systems are integrated throughout the F-22 to provide the pilot information from many sources and produce a clear, simple picture of the combat situation.
- **Maintainability, sustainability, reliability, and responsiveness:** Computerized self-tests of all systems represent just one of the features designed to enhance the reliability and mission-readiness of the F-22. The F-22 requires fewer personnel and equipment for maintenance and deployment compared to the F-15C.

The F-22 Raptor is a single-seat, all-weather fighter that maneuvers easily at both subsonic and supersonic speeds. Powered by two 35,000-pound thrust-class Pratt and Whitney F119-PW-100 turbofan engines, the aircraft can cruise above Mach 1 without using afterburners. The F-22 is approximately 62 feet long, with a wingspan of 44 feet, and a height of more than 16 feet.



The F-22 has enhanced stealth, speed, maneuverability, electronics, and maintainability.

■ **Accomplished thus far**



The F-22 routinely operates at higher altitudes (above 30,000 feet MSL) than the F-15C. Its thrust-to-weight ratio permits the F-22 to achieve speeds needed for air-to-air combat while using lower power settings than an F-15C. These characteristics make the F-22 more fuel efficient than the F-15C.

As designed, the F-22 is a multipurpose fighter capable of both air-to-air and air-to-ground missions. For the Initial F-22 Operational Wing beddown, fulfilling the air dominance (air-to-air) mission will be the priority. Both training and actual missions will heavily emphasize air-to-air activities. The F-22 can carry six radar-guided AIM-120 AMRAAM missiles, two heat-seeking AIM-9 Sidewinder short-range missiles, and a 20-millimeter multi-barrel cannon for air-to-air engagements.

While the F-22 has the capability to perform air-to-ground ordnance delivery, this will not be a primary activity for the Initial F-22 Operational Wing. When performing air-to-ground ordnance delivery, the F-22 can carry two Global Positioning System-aided 1,000-pound Joint Direct Attack Munitions in place of two AIM-120s and two AIM-9 missiles.

1.1.3 F-22 Development

The requirement leading to development of the F-22 was identified through the process described in Air Force Instruction 10-601, *Mission Needs and Operational Requirements Guidance and Procedures*. During the early 1980s, the Air Force assessed its tactical capabilities against projected threats and determined that a mission deficiency would emerge in the near future. Such a deficiency could jeopardize the ability of the United States to ensure that its forces have the freedom of action to conduct operations against opposing forces. By 1984, the Air Force had defined the requirements for an advanced tactical fighter, presented in a *Statement of Operational Need*. Congress has approved acquisition of 339 F-22 aircraft. The first F-22 aircraft flew in 1997; hundreds of flight hours have been completed as of April 2001.

F-22 Force Development and Evaluation (FDE) pilot training will begin in 2002, with actual FDE activities beginning in 2003 at Nellis AFB, Nevada, after completion of Initial Operational Test and Evaluation (IOT&E) at Edwards AFB, California. FDE, like IOT&E, is a part of the overall Operational Test and Evaluation program for the F-22. While IOT&E ensures that the F-22 meets mandatory operational capabilities, FDE tests and evaluates the aircraft and its systems to ensure that it continues to meet

operational requirements for as long as the aircraft is used. FDE also explores the use of new flight techniques and tactics and develops training programs. By testing capabilities of an aircraft in tactical situations, including air-to-air, air-to-ground, and electronic combat operations, FDE provides essential input on tactics to the Weapons School (WS) and operational units.

The WS represents an essential activity performed throughout the life of the aircraft in the Air Force inventory. As established in Multi-Command Regulation 55-120, the WS conducts graduate-level instructor courses in weapons and tactics employment. The F-22 WS offers academic courses and flight training to qualified instructor pilots. Upon completion of WS courses, which include two weeks of combat training exercises, graduate officers return to their home units to provide advanced instruction to unit pilots on employing the aircraft for its mission. As currently planned, F-22 WS graduates from Nellis AFB will return to operational squadrons in 2008.

In 2002, the Air Education and Training Command (AETC) will receive F-22 aircraft to establish advanced pilot training and begin qualifying F-22 fighter pilots to fly the F-22. To accomplish this training, AETC will establish two training squadrons at Tyndall AFB, Florida. The first squadron will be developed from 2003 through 2008, with most of the aircraft available for training by 2004. A second squadron would be established in 2007 and 2008. Members of these squadrons will complete advanced F-22 pilot training to fly and successfully perform the academic work and flying skills necessary to achieve instructor status. A number of these new instructor pilots will be assigned to operational units that will receive F-22s, such as the proposed Initial F-22 Operational Wing. Some will also become WS instructors. By 2004, a sufficient number of qualified pilots will be ready to comprise the first squadron of the Initial F-22 Operational Wing.

The ultimate goal of the F-22 development and deployment process is to provide Air Force operational units with a proven, tested aircraft, as well as with tactics and operational guidance to meet mission requirements. The proposed beddown of the Initial F-22 Operational Wing, as analyzed in this Draft EIS, represents the first step in providing these operational F-22 units.

1.2 Purpose of Initial F-22 Operational Wing Beddown

The purpose of the proposed action is to establish (beddown) the first F-22 Operational Wing at Langley AFB. Establishment of this initial Operational Wing would take place over a period of approximately 5 years and would involve the basing of 72 operational F-22 aircraft, along with the personnel needed to operate and maintain the aircraft and associated facilities for advanced training. The beddown of the 72-aircraft Operational Wing would take place in the following stages:

- 1st Operational Squadron in September 2004 to August 2005
- 2nd Operational Squadron in September 2005 to June 2006
- 3rd Operational Squadron in September 2006 to June 2007

Each of the three squadrons would be composed of 24 PAI F-22s plus 2 BAI F-22s. As such, the Initial F-22 Operational Wing would include 72 PAI and 6 BAI aircraft. PAI consists of the aircraft authorized and assigned to perform the squadron's missions in training, deployment, and combat. BAI includes those aircraft additional to the PAI that are used as substitutes for PAI aircraft

undergoing maintenance, repairs, or inspections. BAI aircraft, as substitutes, permit the squadron to be at its fully authorized strength (24 aircraft). All training, deployment, and other mission activities are based on the number of PAI aircraft in a squadron. For the purpose of analysis in this Draft EIS, the flight activities at the base and in associated airspace will reflect PAI aircraft only. BAI aircraft would not participate in these activities.

Beddown of the F-22 and drawdown of the F-15C would occur at Langley AFB, with part of a squadron of F-22s arriving and an equivalent number of F-15Cs from that squadron being removed until the full squadron is composed of 24 PAI F-22 aircraft. This pattern would apply for two of the three F-15C squadrons with 24 PAI aircraft. The third squadron would receive 24 PAI F-22s to replace its 18 PAI F-15Cs. In total, Langley AFB would support 6 additional PAI aircraft (66 F-15Cs versus 72 F-22s) as a result of the proposed beddown. At Eglin, Elmendorf, and Mountain Home alternative bases, the operational F-15Cs would be replaced with operational F-22s. At Tyndall AFB, all F-22s for the Operational Wing would be additive to the base since there are no operational F-15C aircraft to drawdown. The three operational F-22 squadrons at Tyndall AFB would be under a new, separate wing. Personnel changes to support the beddown would follow the same sequence as the aircraft beddown.

1.3 Need for Initial F-22 Operational Wing Beddown

The overall mission of the Air Force is defense of the United States and fulfillment of the directives of the President and Secretary of Defense. To meet these requirements, the Air Force must develop and operate combat and support aircraft and train personnel needed for the job. The F-22, to supplement and replace the F-15C, needs to be operationally based. The Air Force must establish operational F-22 wings that fulfill the F-22's essential air dominance role as part of our national defense.



The proposed action is to beddown the first Operational Wing of F-22s at Langley AFB and replace the existing F-15Cs, pictured above.



Operational aircrews must continually train to maintain skills essential for combat. The base selected for the F-22 beddown needs facilities and training airspace for these operational aircrews.

The establishment of the first Operational Wing of F-22 aircraft must be accomplished at an Air Force installation with the infrastructure and facilities to support three operational squadrons of F-22 aircraft without displacing other missions or affecting a unit's ability to meet day-to-day operational requirements. The Operational Wing must be combat-ready and able to perform its mission anywhere in the world at any time. The installation selected for the beddown of the Initial F-22 Operational Wing must provide training facilities, access to training airspace, existing basic infrastructure, and the capability to expand or accommodate new facilities and personnel.