Syrian Air Force and Air Defense Capabilities
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Neutralizing Syrian Air Force and Air Defense Capabilities

The Syrian Air Force is capable of aerial bombardment and close air support, aerial resupply, and aerial delivery of chemical weapons. Enumerating viable military options to neutralize Syrian air capabilities requires clear identification of the problem to solve.

If the problem is how to secure the victory of a secular Syrian opposition over the Assad regime, then disrupting aerial resupply is critical. It is also feasible without establishing a No Fly Zone (NFZ), and thus without contending with the Syrian Integrated Air Defense System (IADS).

If the problem is how to reduce air strikes as an operational and humanitarian concern, then disrupting coordinated fixed wing air operations is also possible without establishing a NFZ, for example by sustaining long-range fires upon Syrian airfields. The only reason to completely destroy the Syrian IADS is to establish full air control in order to eliminate rotary wing air strikes.

If the problem is establishing a humanitarian safe zone or corridor, a limited No Fly Zone will provide effective air cover, which is necessary. However, this would be insufficient to establish a fully "safe" zone with respect to ground defense. Ground operations are an independent requirement.

If the problem is how to eliminate the chemical threat, then it is important to understand that chemical weapons cannot be neutralized by air. Grounding the Syrian Air Force by establishing a No Fly Zone will not prevent delivery of chemical munitions via artillery, and aerial bombardment of chemical facilities carries a high risk of collateral damage.

Syrian Civil War: Campaign Update, May 2013

Campaign Update:

- **Rebel Gains in the South and East**: The Opposition seized its first provincial capital at al-Raqqa in April 2013. The opposition also launched a deliberate operation in southern Syria, emulating tactics from the northern campaign, namely isolating regime outposts by disrupting Ground Lines of Communication (GLOCs).

- **Regime Gains in Homs**: Hezbollah has launched a ground assault upon opposition forces southwest of Homs in the village of al-Qusayr. The Regime reestablished control of the GLOC connecting Hama to Idlib, relieving pressure to resupply by air. The Regime is now pressing on al-Qusayr from the north.

- **Chemical Weapons**: There are reports of CW deployment in Daraya and Ateibeh, villages proximate to Damascus. The primary delivery mechanism appears to be low-end ground munitions, possibly Katyusha rockets.

- **Israeli Airstrikes**: IAF bombed a military and scientific research center in Jamraya north of Damascus as well as facilities resolving to the 4th Division HQ and the 104th Brigade of the Syrian Republican Guard. Syrian sources report a total of nine strikes on Sunday.

- **Ethnic Cleansing along Coast**: Syrian sources report that thousands of civilians have been massacred in mixed villages along the Syrian coast in recent days. Many civilians, including Sunni, had fled there for safe haven during the civil war.

Battle for Damascus: Campaign Update, May 2013

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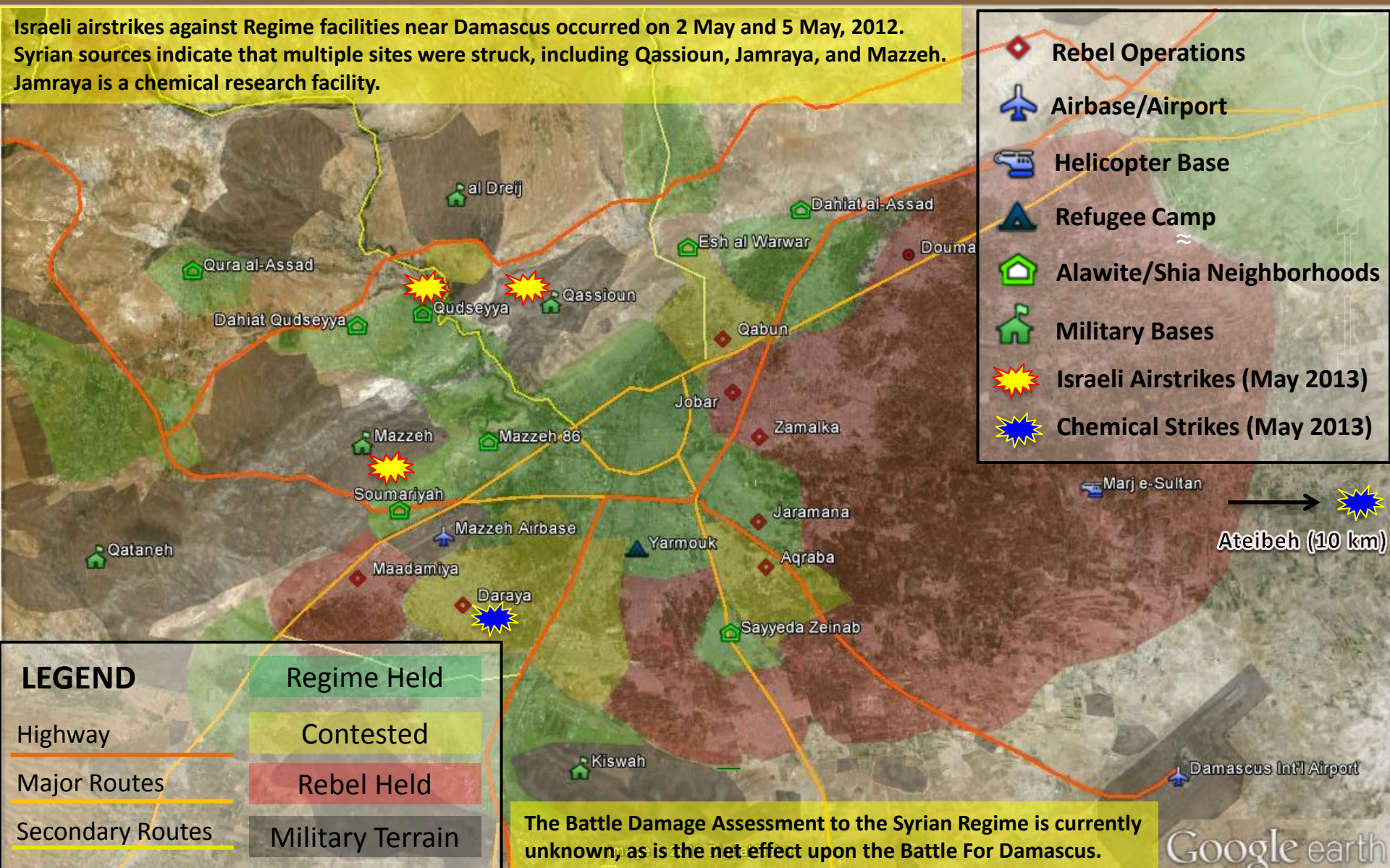
Israeli airstrikes against Regime facilities near Damascus occurred on 2 May and 5 May, 2012. Syrian sources indicate that multiple sites were struck, including Qassioun, Jamraya, and Mazzeh. Jamraya is a chemical research facility.



The Battle Damage Assessment to the Syrian Regime is currently unknown, as is the net effect upon the Battle For Damascus.

Google earth

Syrian Air Capabilities: May 2013

The Syrian regime is able to conduct:

- **Air Strikes**. Syrian Air Force is effective at conducting aerial bombardment and close air support against opposition forces on the ground, as demonstrated by an apparent rise in air-to-ground attacks since January 2013. The regime began to employ air assets in the Summer of 2012 in order to repel rebel advance upon urban centers.

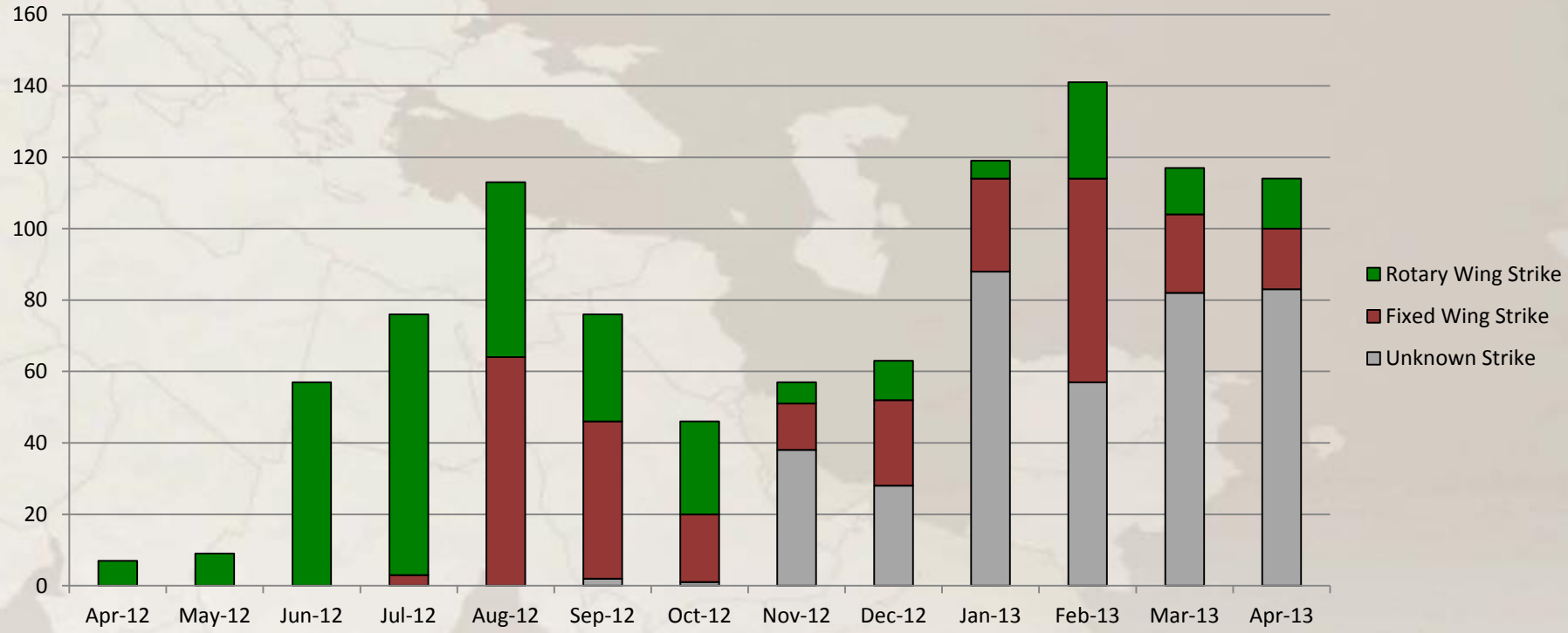
- **Aerial Resupply**. The Syrian regime is able to receive Iranian resupply by air, most likely through the ad-Dumayr airfield East of Damascus and to Mazzeh military airfield near the Lebanese border. Aerial resupply within Syria varies, though it has been the primary mechanism for resupply to outposts that cannot be resupplied by ground transportation.

- **Aerial Delivery of CW**. Air-dropped bombs are a traditional method to conduct chemical attacks. The regime has the capacity to deliver chemical weapons inside Syrian airspace. It is likely that they also have the requisite delivery mechanism.

- **Air Defense**. Syrian IADS is well-equipped, but it is old and poorly maintained. Against close-range targets, Syrian IADS is still effective, as demonstrated by the shootdown of Turkish reconnaissance aircraft in July 2012. Against long-range targets, Syrian IADS is ineffective, as demonstrated by recent Israeli airstrikes near Damascus.

Syrian Air Strikes: Increased activity 2013

Regime air strikes have increased since January 2013. Air strikes in 2013 included rotary wing and fixed wing aircraft, in close air support to regime ground operations and independent aerial bombardment.



Note: ISW tracking of airstrikes shifted from YouTube videos to SOHR reporting in November 2012. SOHR reporting is consistent, validating the upward trend, though less granularity is provided to distinguish rotary from fixed wing strikes. This data more accurately reflects air strikes against opposition military targets than retaliatory attacks against the civilian population, which became prevalent in December 2012.

Syrian Air Strikes: April 2012 - 2013

Apr – Jun 2012

Regime airstrikes were conducted uniformly with rotary wing aircraft.

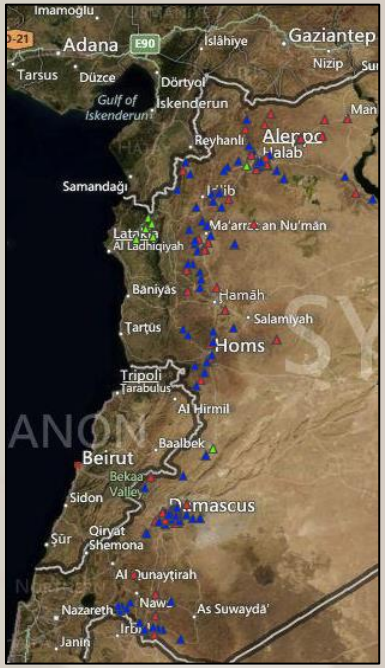
Jul – Sep 2012

Regime airstrikes near Idlib and Aleppo incorporated fixed wing aircraft.

Oct – Dec 2012

Regime airstrikes in Damascus incorporated fixed wing aircraft.

Jan – Mar 2013



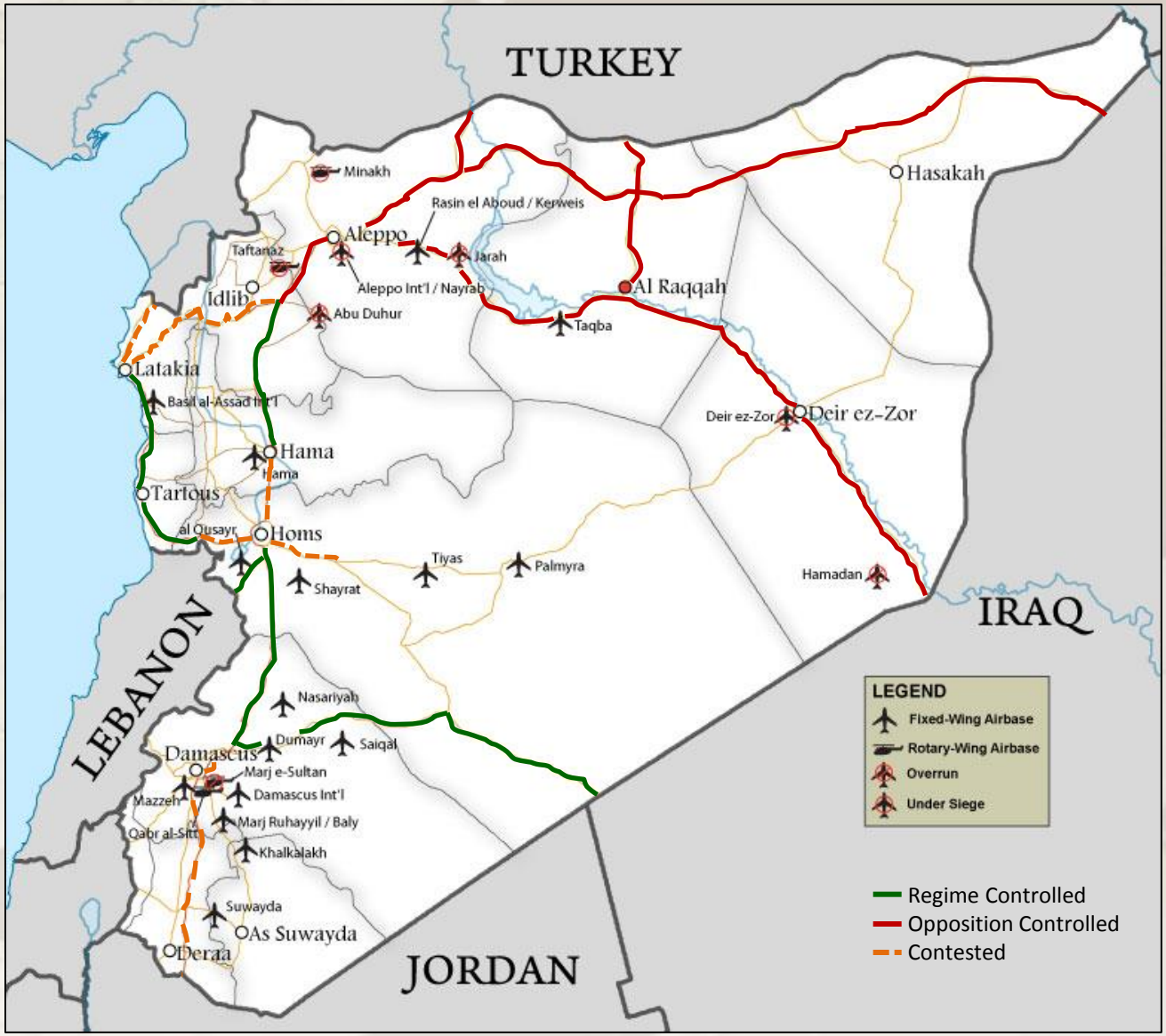
The overall volume of airstrikes increased along the major highways in January 2013 as the regime lost control of the GLOCS.

April 2013

Diminished airstrikes between Hama and Idlib corresponds with regime reestablishment of GLOC. Attacks also increased around Homs and Damascus.

Legend:
- **Rotary Wing Strikes**
- **Fixed Wing Strikes**
- **Unknown Airstrikes**

Syrian Regime Resupply: Status of Airfields and Roads



The map depicts Syrian airfields and highways that have been overrun or are under siege by the opposition. Most of the airfields in the center and south of Syria are still available for full use by the regime.

The regime relies primarily upon aerial resupply where the opposition retains control of key GLOCS. The regime regained control of the main highway from Hama to Idlib in April 2013, freeing air assets for airstrikes and close air support elsewhere.

Regime resupply is not limited to the ALOCS and GLOCS depicted here. It is also likely that the Regime is able to leverage established criminal networks for northern resupply as well. The Regime also has the port at Tartus.

However, aerial resupply is primary for international resupply. First, it can manage heavy and sensitive cargo, like Iranian missiles. Second, GLOCS into Syria are present, but severely constrained. Third, the port of Tartus is highly visible and easily blocked from the sea. Disrupting aerial resupply will severely degrade the ability of the Assad regime, and the Syrian Air Force, to sustain.

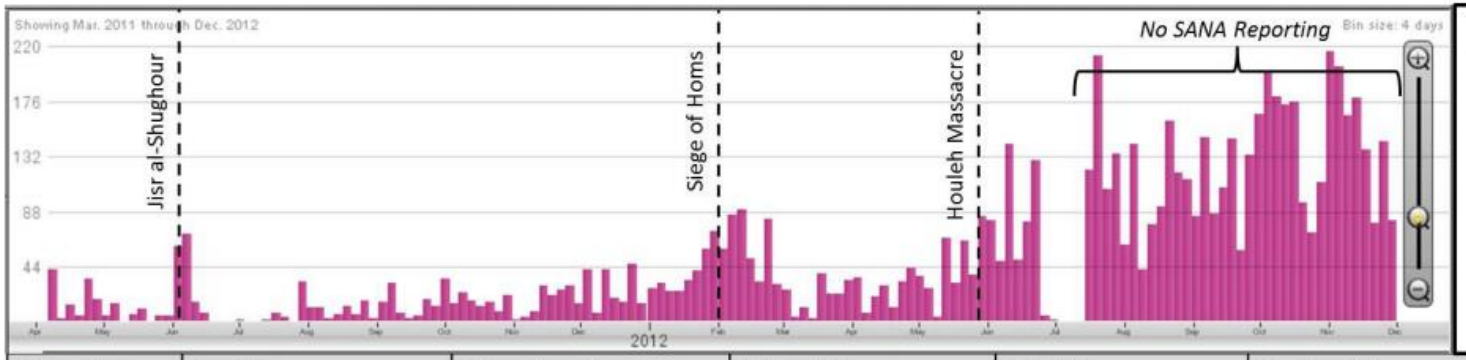
Syrian Regime Vulnerability- Equipment: Supply, Maintenance, and Training

Aircraft	Function	QTY (est)	
Mi-8/17	Medium transport helicopter	100	
An-24/26	Medium transport aircraft	7	
IL-76	Medium-Heavy transport aircraft	5	
Mi-2	Attack helicopter	10-20	
Mi-24	Attack helicopter	35-48	
SA-342	Attack helicopter	35	Low readiness
MiG 21/25	Air-to-Air aircraft	160-240	
MiG 23/29	Attack aircraft	135-225	
SU-22/24	Attack aircraft	80-110	
L-39	Trainer aircraft	40-70	High readiness

- A majority of SAF fixed wing aircraft are legacy systems from the former Soviet inventory. These MiG and SU series aircraft require significant spare parts supply, maintenance man-hours, and training to remain in a mission capable status.
- These aircraft require a high level of technical expertise to fly and employ in combat. These skills take a long time to acquire, and they are perishable.
- The majority of SAF fixed wing airstrikes and resupply missions are conducted with aircraft that are easier to maintain and operate, specifically the L-39 for strikes and the IL-76 for transport.
- Therefore, when estimating the equipment capabilities of the SAF, it is important to recognize that the Soviet-era MiG and SU series aircraft have very low / nonexistent mission capable rates. In order to neutralize the SAF, it is primarily necessary to neutralize the L-39 and IL-76 fleet.

Syrian Regime Vulnerability- Personnel: Casualties and Defection

- Defections from the Syrian Air Force began in July 2012, when the graphic below depicts that SANA stopped reporting its casualties. There have been seven high profile defections from the Syrian Air Force, in addition to numerous midgrade defections.
- Defections from the Air Force are more difficult because airmen are under tighter security. The technical skill and unit integrity of the Air Force are high value, and defections adversely affect readiness.
- The graphic below depicts total Regime KIA/WIA estimates, of which Air Force casualties comprise a part. The readiness of the Syrian Air Force is also adversely affected by casualties.



Regime casualties steadily rose until the end of June '12, when SANA stopped reporting the numbers of soldiers killed in action (KIA) after reaching a cumulative total of 3,000.

Between July and December '12 SOHR reported some 4,500 regime KIA.

Cumulative Casualties	July '11	November '11	March '12	July '12	October '12	December '12
KIA	350	730	1,820	3,100	5,330	7,620
WIA (x4)	1400	2900	7,300	12,400	21,300	30,500

FIGURE 5 | REGIME ATTRITION DATA WIA estimated by multiplying KIA x 4

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Possible Courses of Action

	Neutralize Air Strikes	Neutralize Aerial Resupply	Neutralize CW threat in Syria / Lebanon	Establish humanitarian safe zone on Turkish / Syrian border
Limited Strikes: Destroy Critical Infrastructure at Airfields	Air strike capability can be degraded by destroying runways, command and control, and fuel.	Aerial resupply capability (receive/distribute) can be degraded by destroying runways, command and control, and fuel.	CW cannot be addressed by degraded critical infrastructure at Syrian airfields.	Destroying Syrian Air Force (SAF) infrastructure will reduce air attacks against a safe zone.
Limited Strikes: Destroy Syrian Air Force (SAF) Fleet	Syrian air capabilities to conduct air strikes can be degraded by destroying aircraft, specifically L-39.	Aerial resupply (distribution) can be degraded by destroying aircraft, specifically IL-76; (receipt) cannot be addressed by destroying Syrian planes.	CW cannot be addressed by destroying Syrian planes.	Destroying SAF aircraft will reduce air attacks against a safe zone.
Establish No Fly Zone (NFZ)	Syrian air capabilities to conduct air strikes can be prevented by establishing a NFZ.	Syrian air capabilities to conduct and receive aerial resupply can be eliminated by establishing a NFZ.	CW cannot be addressed by establishing a NFZ.	Establishing a NFZ on Turkish / Syrian border will prevent air attacks against a safe zone.
Destroy Chemical Weapon (CW) Facilities	Destroying CW facilities will not degrade Syrian regime capability to conduct air strikes.	Destroying CW facilities will not degrade Syrian regime capability to conduct and receive aerial resupply.	Destroying CW facilities will degrade Syrian capability to conduct CW strikes, but may incur collateral damage.	Destroying CW facilities will degrade Syrian capability to conduct CW strikes against a safe zone.
Ground assault on CW and artillery sites	A ground assault on CW and artillery sites will not degrade Syrian regime capabilities to conduct air strikes.	A ground assault on CW and artillery sites will not degrade Syrian regime capabilities to conduct air strikes.	A ground assault on CW and artillery sites will eliminate Syrian regime capabilities to conduct CW strikes.	A ground assault on chemical and artillery sites will eliminate Syrian regime capabilities to conduct CW strikes against a safe zone.

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Conclusion

Disrupting the aerial resupply of the Syrian regime will push the regime onto alternate supply routes, which can be more easily interdicted by the Syrian opposition on land and the international community at sea.

Degrading the ability of the Syrian Air Force (SAF) to conduct fixed wing air strikes will push the regime onto rotary wing operations, which can be more easily targeted and destroyed by the Syrian opposition. In July 2012, rebel success in shooting down regime helicopters led to a substantial increase in the use of fixed wing aircraft. It may also encourage the regime to increase artillery, long range rockets, and SCUD missile attacks.

A full or limited No Fly Zone will support a humanitarian corridor or zone, but it will not fully protect the area against all threats. A No Fly Zone will provide effective air cover to a humanitarian zone that has established defenses on the ground.

Degrading the Syrian Air Force will not eliminate the CW threat because chemical weapons can be moved and fired from the ground. This requirement falls outside of this discussion of Syrian air capabilities.

ADDITIONAL READING

- ***Syrian Air Defense Force Attack on Turkish Reconnaissance Aircraft*** **(July 2012), by Christopher Harmer**
  http://www.understandingwar.org/publications?type[0]=backgrounder&type[1]=map&type[2]=other_work&type[3]=report&tid[0]=293&field_lastname_value=&sort_by=created&sort_order=DESC&page=1

- ***Threat and Response: Israeli Missile Defense*** **(August 2012), by Christopher Harmer**
  http://www.understandingwar.org/backgrounder/threat-and-response-israeli-missile-defense

- ***Iranian Strategy in Syria*** **(May 2013), by Joseph Holliday, William Fulton, and Sam Wyer**
  http://www.understandingwar.org/report/iranian-strategy-syria

- ***The Syrian Army: Doctrinal Order of Battle*** **(February 2013), by Joseph Holliday**
  http://www.understandingwar.org/backgrounder/syrian-army-doctrinal-order-battle

- ***The Assad Regime: From Counterinsurgency to Civil War*** **(March 2013), by Joseph Holliday**
  http://www.understandingwar.org/report/assad-regime

- ***Free Syrian Army*** **(March 2013), by Elizabeth O'Bagy**
  http://www.understandingwar.org/report/free-syrian-army

- ***Syria Update: Implications of Chemical Weapon Use on U.S. Aid Decision*** **(May 2013), by Liam Durfee**
  http://www.understandingwar.org/backgrounder/syria-update-chemical-weapons

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